INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

CALIMESA CREEK STAGE III PROJECT

Lead Agency:

City of Calimesa
908 Park Avenue
Calimesa, CA 92320
(909) 795-9801

Project Proponent:

City of Calimesa
Engineering Department
908 Park Avenue
Calimesa, CA 92320
909-795-9801

Environmental Consultant:

Phil Martin & Associates
1809 E. Dyer Road, Suite 301
Santa Ana, California 92705
(949) 454-1800

April 3, 2023

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ENGINEERING DEPARTMENT

A. Project Title: Calimesa Creek Stage III

B. Lead Agency Name and Address:
City of Calimesa
908 Park Avenue
Calimesa, CA 92320

C. Contact Person and Phone Number:
Michael Thornton, City Engineer (909) 795-9801
Email: mthornton@cityofcalimesa.net

D. Project Location: The Calimesa Creek Stage III Project (project) is located in the City of Calimesa and the City of Yucaipa as shown in Figure 1, Regional Map. More specifically, the detention basin is generally located between County Line Road on the north, 3rd Street on the east, Rogers Lane/Court on the south, and 4th Street on the west. The proposed storm drain system will be located along County Line Road between 5th Street on the east and Interstate 10 on the west, as shown in Figure 2, Local Vicinity Map. An aerial photograph of the project site and the surrounding land uses is shown in Figure 3, Aerial Photo. The on-site topography is shown in Figure 4, USGS Topo Map.

E. Project Sponsor's Name and Address:
City of Calimesa
Public Works Department
908 Park Avenue
Calimesa, CA 92320
909-795-9801

F. General Plan Designation: The land use designations for the project site as designated by the Calimesa General Plan include CC – Community Commercial (FAR 50:1) for the proposed detention basin. For the proposed storm drain system, it will be primarily located in County Line Road public right-of-way with downstream connection being within property zoned as DVC – Downtown Village Commercial Park and upstream connection being RH – Residential High (14-20 DU/AC), and DVC – Downtown Village Commercial Park. The project would not require a general plan amendment.

G. Zoning: The proposed detention basin is zoned C-C (Community Commercial). Calimesa Creek is included in the Downtown Business District and zoned D-V-C Downtown Village Commercial with the Calimesa Creek Overlay. The proposed underground storm drain in County Line Road is within a public roadway in both the City of Calimesa and the City of Yucaipa. The project would not require a zone change.

H. Description of Project: The proposed Calimesa Creek Stage III project is a component of and the continuation of the Calimesa Channel "Stage I" and "Stage II" projects that were completed by the Riverside County Flood Control and Water Conservation District (RCFC&WCD) in 2002. The project consists of a 53-acre-foot detention basin and variable size storm drain system along County Line Road. Each are discussed in greater detail in the following paragraphs and are shown on Figure 5 (Calimesa Creek Stage III Site Plan):

Detention Basin

- Basin – The scope of work consists of site grading, 35,000 CY of material export, maintenance road construction, site drainage system improvements, site access improvements, and site fencing. The basin site is 4.5 acres.

- Inlet Improvements – Within the existing Calimesa Creek Channel, a diversion facility will be constructed to divert channel flows to the detention basin. The existing Trapezoidal Channel will be connected to a new 96” reinforced concrete pipe. The pipe will release flows to the basin through an energy dissipation structure (including head and wing walls, and rip rap).

- Outlet Improvements – Includes a low flow system and a spillway. The low flow pipe will cause attenuation – runoff will be maintained in the basin and released over a longer period of time. It includes concrete walls and rip rap. The spillway will convey larger storm event flow back into the trapezoidal channel.

Storm Drain System

- Transition Structures – Include connection to the existing I-10 drainage system using a manhole structure and a connection to the existing trapezoidal channel near 5th Street. Transition structures will be reinforced concrete.

- Storm Drain System – Storm drain system includes 18” thru 78” reinforced concrete pipe, manholes, and inlet structures (e.g., catch basins).

- Low Flow Diversion – To maintain small flows along the natural creek, a low flow diversion system will be constructed near 5th Street.

Once completed, the Calimesa Creek Project III project would provide 100-year flood protection to existing and future development along County Line Road and Calimesa Creek from basin on the east to Interstate 10 on the west.

Source: Phil Martin & Associates, Inc.

Figure 1
Regional Map

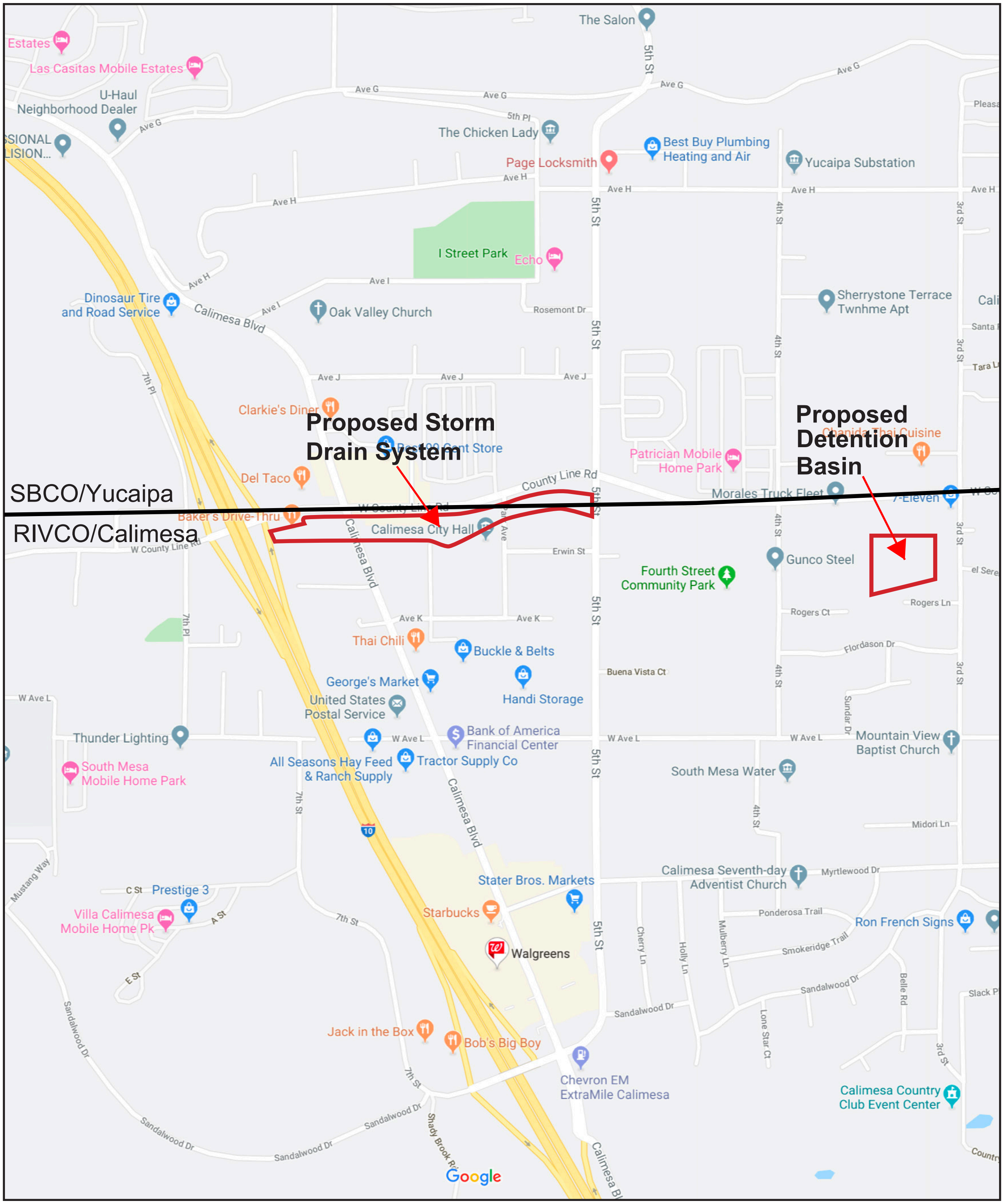


Figure 2
Local Vicinity Map

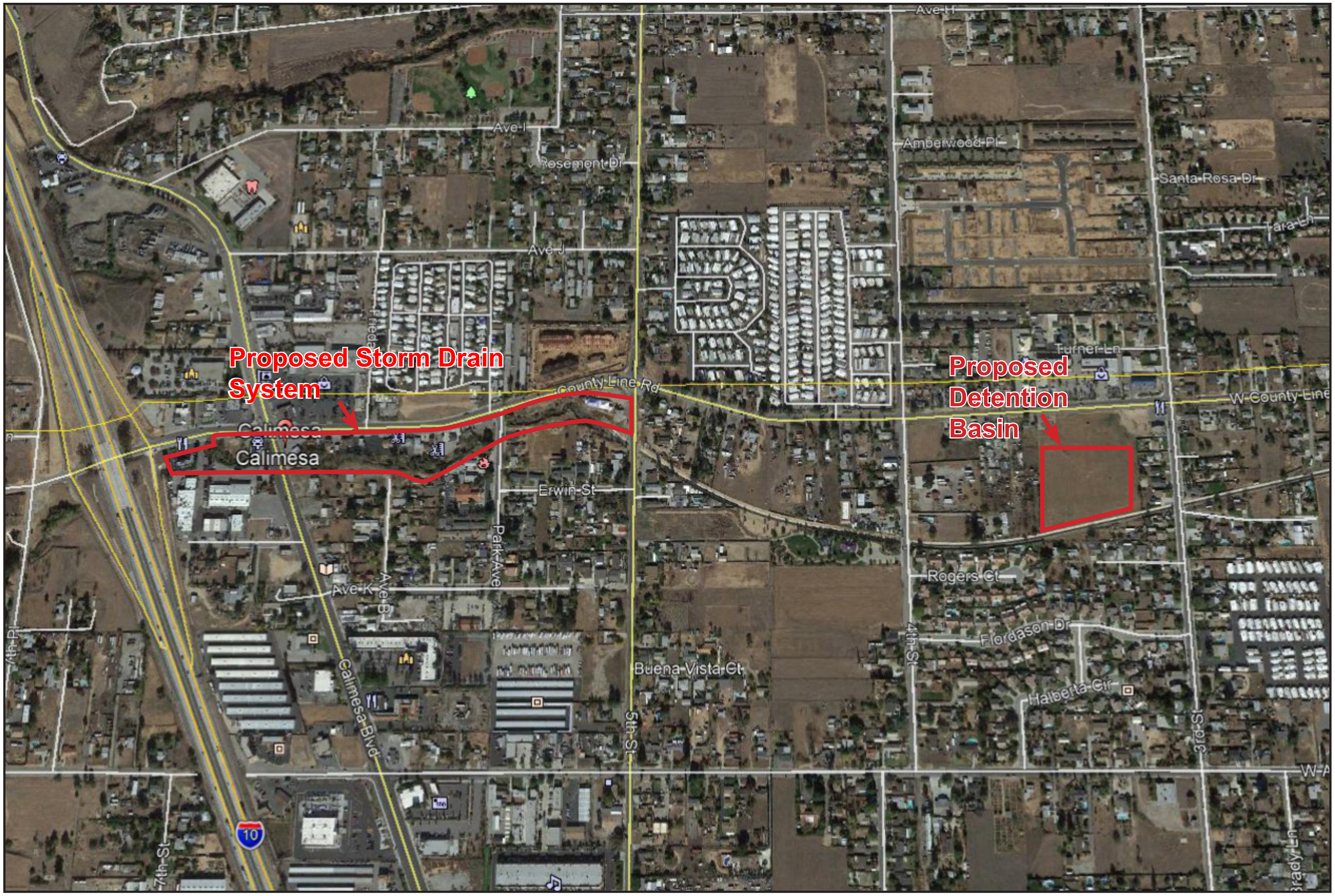


Figure 3
Aerial Photo

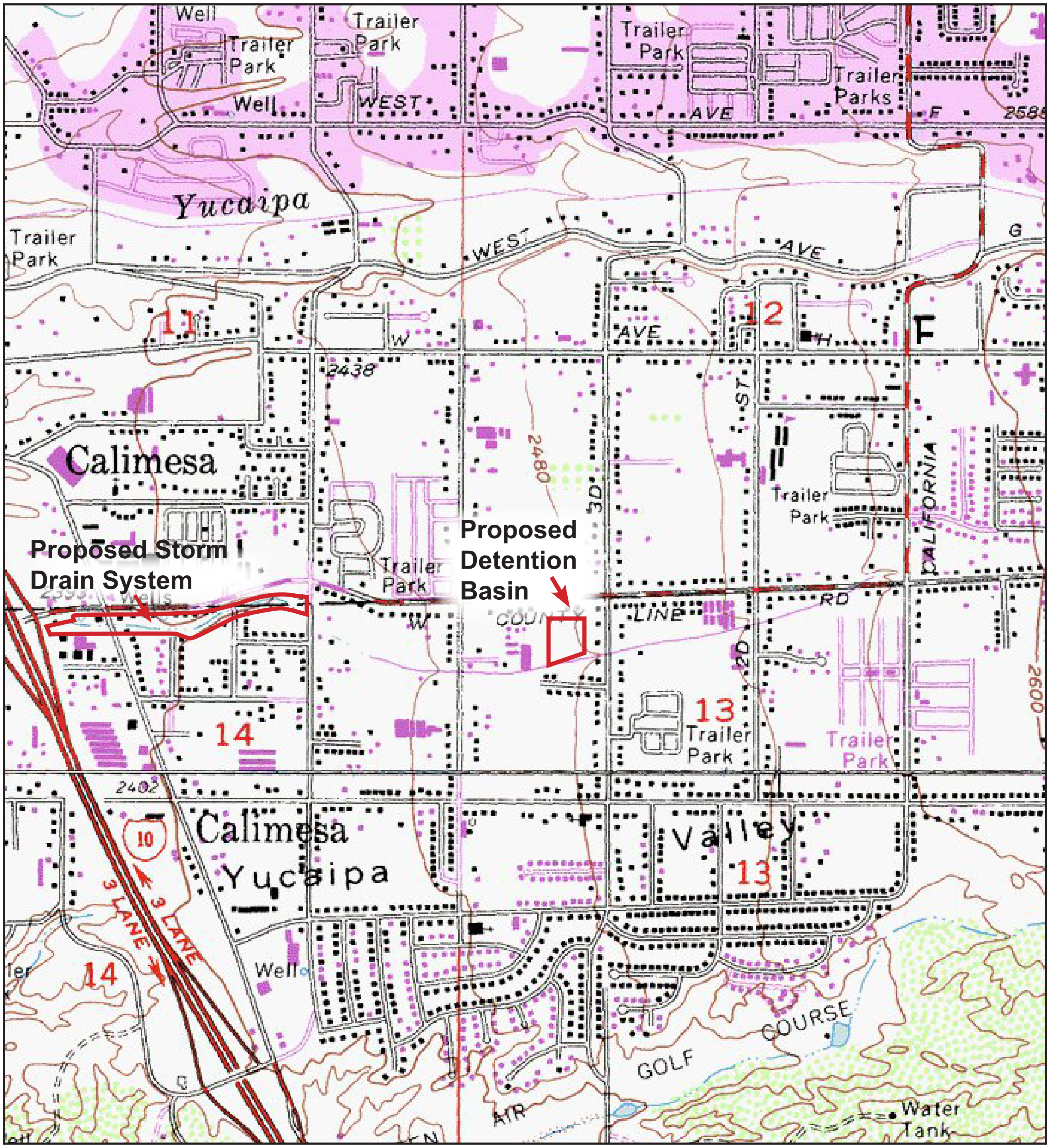


Figure 4

USGS Topo Map

The project would provide the following objectives:

- Reduce peak 100-year flow rate to downstream facilities;
- Eliminate flooding from the basin to the west side of I-10 including the Calimesa Fire Station, City Hall, and Downtown Business District

Existing Calimesa Creek consists of a concrete lined trapezoidal channel beginning at County Line Road, approximately 500 feet west of California Street. The existing trapezoidal channel, with a base width of 4 feet and a depth of 5 feet, meanders westerly through existing residential neighborhoods and outlets on the west side of 5th Street. At 5th Street, Calimesa Creek extends west as an unimproved earthen channel to an existing inlet near Interstate 10. A 6' x 6' reinforced concrete box (RCB) extends under I-10 and connects with the Calimesa-Avenue L east of the freeway and continues west and southwest where it empties into San Timoteo Creek.

The project includes the design, engineering and construction of a 4.5-acre detention basin on the north side of Calimesa Creek approximately 150 feet west of 3rd Street, 18", 24",54", 72" and 78" underground storm drains, box culverts, roadway crossings and pipe.

The Calimesa Creek system operates under the Santa Ana Regional Water Quality Control Board's (SRWQCB) National Pollutant Discharge Elimination System (NPDES) permit. The permit requires that any hydromodification to a watercourse within its jurisdiction be considered as part of a project's analysis. Hydromodification is the change in rainfall-runoff relationships resulting from impervious areas on a site/project. In some stream systems, excessive hydromodification can cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. The project must incorporate hydromodification management to reduce degradation of the physical structure of the creek downstream of the proposed improvements.

The preliminary engineering analysis and design indicates the need for the construction of a detention basin adjacent to and on the north side of Calimesa Creek west of 3rd Street. The preliminary analysis and design also identifies the need for a low-flow channel and active floodplain dimensions that are characteristic for this reach of Calimesa Creek.

The basin portion of the project includes a 53-acre foot detention basin on a 4.5-acre parcel of vacant land that is adjacent to and north of the creek and approximately 150 feet west of 3rd Street. The detention basin would capture upstream high storm water flows in Calimesa Creek. Project export is estimated at 35,000 cubic yards of materials associated with the excavation of the detention basin. All export material would be hauled to the San Timoteo Landfill that is located approximately 11 miles southwest of the project in the City of Redlands.

The conveyance portion of the project includes connections to the existing trapezoidal storm channel near 5th Street and the existing I-10 conveyance storm drain where a low-flow diversion structure underground 72" reinforced concrete pipe (RCP) and related facilities. The existing drainage patterns of Calimesa Creek would generally be maintained, with the exception of the underground storm drain that would be constructed in County Line Road. Maintaining the existing on-site drainage pattern along with the proposed detention basin would reduce existing flooding impacts associated with Calimesa Creek downstream of the proposed detention basin. Once completed, the project would provide 100-year flood protection for the Calimesa Channel watershed upstream from the basin to Interstate 10.

In order to convey the 100-year runoff from both the Calimesa Creek watershed and the Calimesa-Avenue L watershed westerly across Interstate 10, the existing sump and 6' x 6' RCB at the freeway would require additional modifications, replacement, or construction of an additional drainage facility crossing under the freeway as a component of a regional drainage plan. This would involve coordination with Caltrans, the City of Calimesa, the City of Yucaipa, and RCFC&WCD. However, the proposed project would significantly decrease the flooding potential at this existing crossing with the construction of the proposed detention basin. Therefore, the project does not include improvements to the drainage system under I-10.

The project would comply with South Coast Air Quality Management District Rule 403 which requires the application of standard best management practices during construction and operation activities and includes the application of water or chemical stabilizers to disturbed soils, manage haul road dust by the use of water, cover haul vehicles, restrict vehicle speeds on on-site unpaved roads to 15 mph, sweep loose dirt from paved site access roadways, stop construction activity when wind speeds exceed 25 mph and establish a permanent ground cover on finished areas.

The project is scheduled to be constructed in two phases. The first phase includes the construction of the storm drains and junction structures that would start in October 2023 and completed in March 2024. The second phase includes the construction of the detention basin and is scheduled to start construction in December 2023 and completed in August 2024. The proposed site plan is shown in Figure 5, Site Plan.

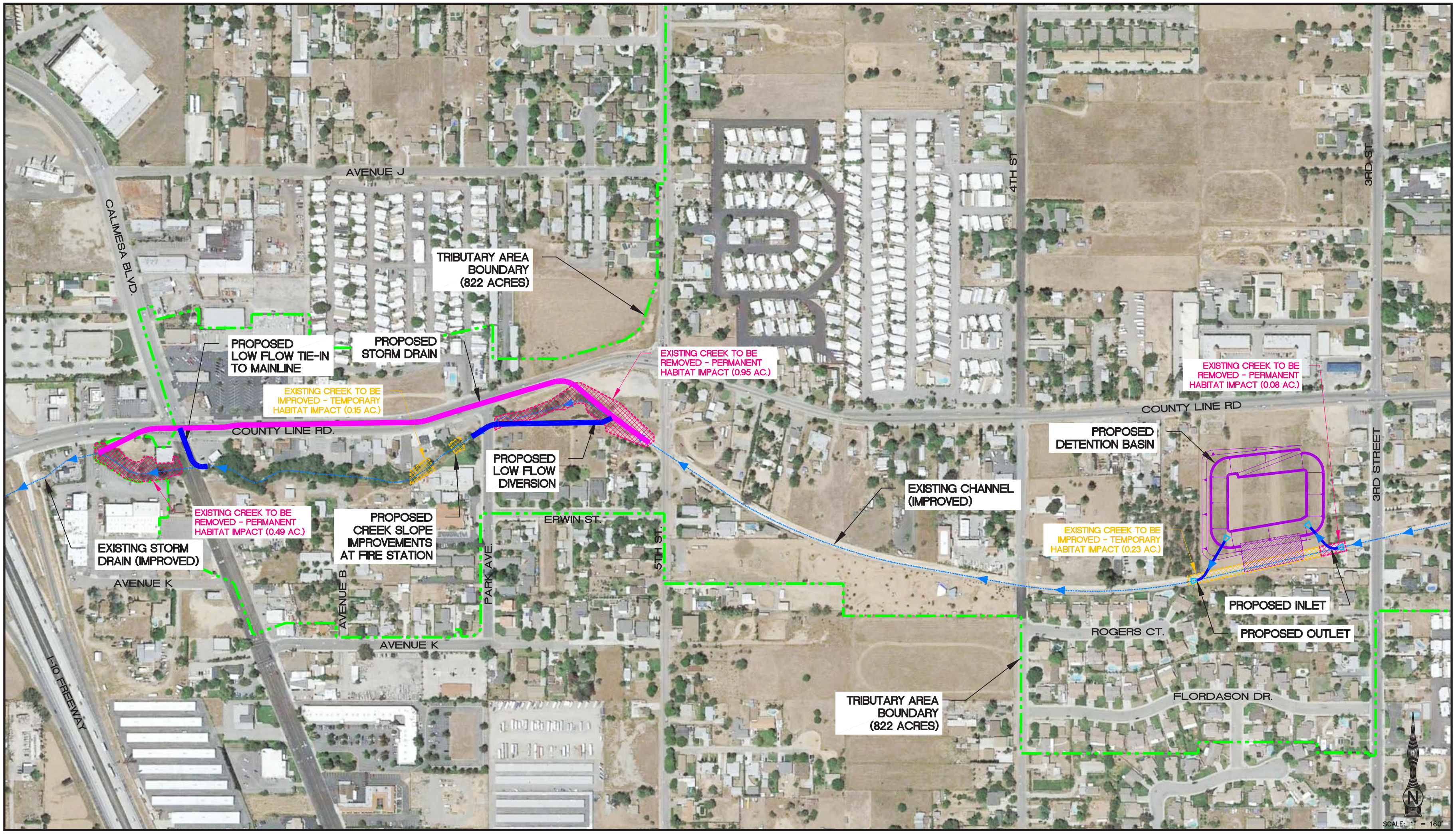
The discretionary action required from the City of Calimesa is approval of the project and adoption of the Mitigated Negative Declaration (MND)

I. **Surrounding Land Uses and Setting:** The existing land uses surrounding the proposed detention basin include single-family detached residential homes to the east, south and west and a retail shopping center in the City of Yucaipa to the north, north of County Line Road. The existing land uses adjacent to the proposed storm drain improvements from 5th Street on the east to Interstate 10 on the west include vacant land and single-family detached residential units to the south and multi-family to the north in the City of Yucaipa, north of County Line Road. The land uses from Park Avenue to Calimesa Boulevard include the City of Calimesa city hall and single-family residences south of the creek and commercial use to the north. The land uses from Calimesa Boulevard west to Interstate 10 include a single-family residence and commercial use to the south and commercial use to the north. The existing land uses adjacent to the underground storm drain proposed for County Line Road include commercial uses in the City of Yucaipa to the north and commercial uses in the City of Calimesa to the south. County Line Road forms the city boundary between the cities of Yucaipa and Calimesa. Figures 6 and 7 show photographs of the on-site land uses and Figure 7 shows the surrounding land uses. Figure 8 is a photo orientation map showing the location of the on-site and surrounding land use photos.

J. **Other Public Agencies Whose Approval is Required:** The City of Yucaipa will issue an encroachment permit for work along the north side of County Line Road. The project also requires a Notice of Intent to comply with the General Construction Activity NPDES Permit from the California State Water Resources Control Board – Santa Ana Region and an encroachment permit from the Riverside County Flood Control and Water Conservation District. If jurisdictional waters are impacted as a result of project implementation, appropriate permits shall be obtained pursuant to Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers, a Water Quality Certification pursuant to Section 401 of the Clean Water Act from the Regional Water Quality Control Board, and a Streambed Alteration Agreement from CDFW pursuant to Sections 1600–1616 of the California Fish and Game Code.

PMA Phil Martin & Associates, Inc.

CALIMESA CREEK STAGE III

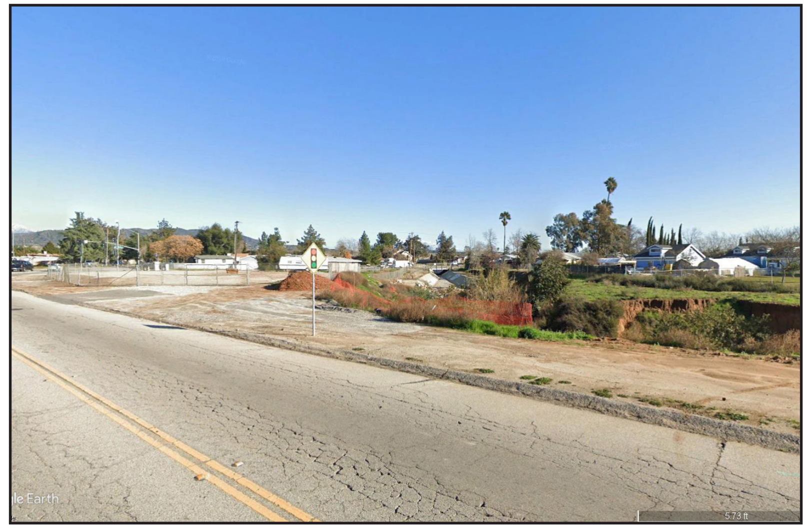


Source: TKE Engineering, Inc.

Figure 5

Site Plan

A. *Looking at proposed detention basin from Co. Line Road*



B. *Looking at proposed diversion structure at 5th Street and Co. Line Road*

C. *Looking at proposed creek improvements west of Park Avenue*

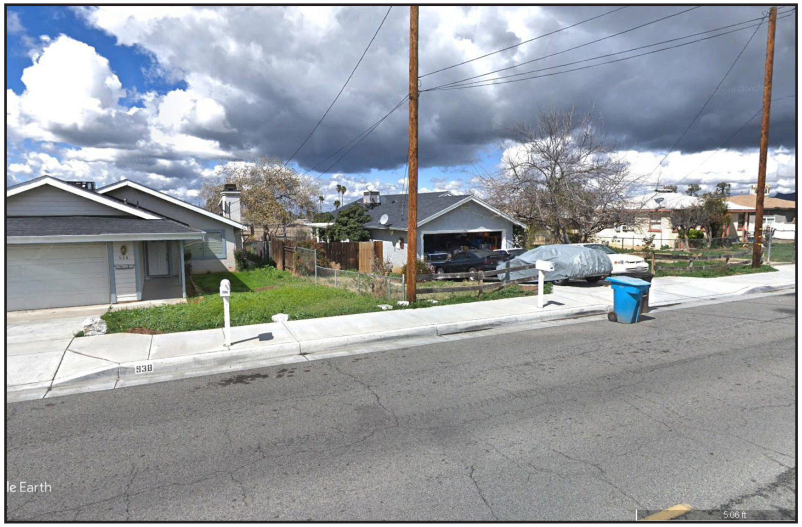
D. *Looking at proposed underground storm drain alignment in Co. Line Road at Calimesa Blvd.*

Figure 6

On Site Photographs

E. *Calimesa Fire Station south of the creek at Park Avenue*

F. *Looking at the businesses along County Line Road*



G. *Looking at the existing residences east of the proposed detention basin*

H. *Existing businesses along south side of County Line Road west of Park Avenue*

Figure 7

Surrounding Photographs

PMA Phil Martin & Associates, Inc.

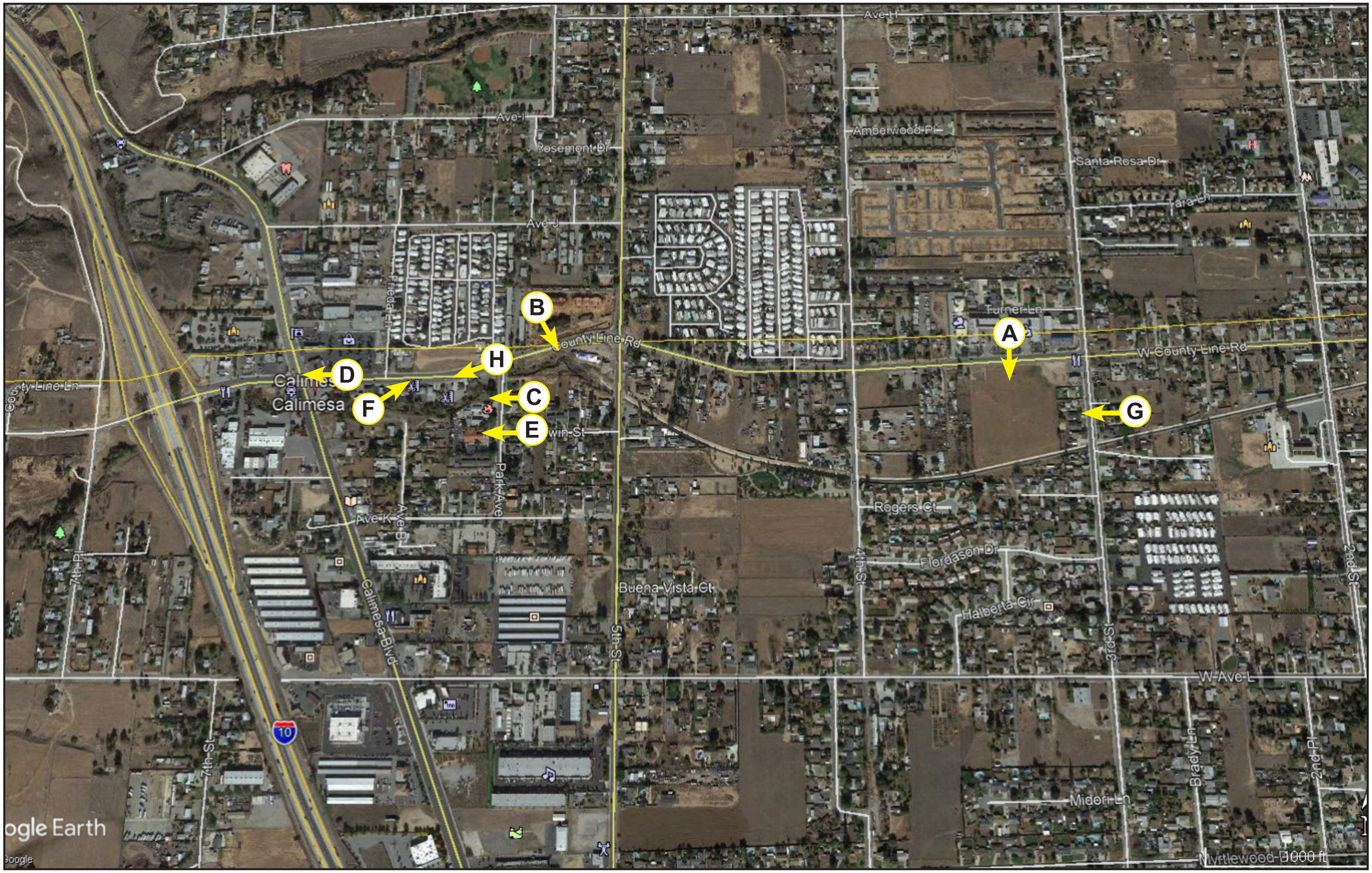


Figure 8
Photo Orientation Map

K. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?** Tribal letters were mailed November 25, 2019 to five Native American tribes pursuant to Assembly Bill 52 (AB52). The tribes that were contacted by the city include:

1. Morongo Band of Mission Indians
2. Pechanga Band of Lusieño Indians
3. San Manuel Band of Mission Indians
4. Soboba Band of Lusieño Indians
5. Torres-Martinez Desert Cahuilla Indians

The San Manuel Band of Mission Indians (SMBMI) are the only tribe that formally invited consultation with the City in compliance with 21080.3.1 of the California Public Resources Code, Division 13, Environmental Quality. Consultations with SMBMI will continue throughout environmental compliance processing. The results of the consultation are provided in Sections V and XVIII of this MND.

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process (see Public Resources Code section 21080.3.2). Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3 (c) contains provisions specific to confidentiality.

L. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☑ Air Quality
☑ Biological Resources	☑ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Greenhouse Gas Emissions	☑ Hazards and Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☑ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☑ Transportation	☑ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

M. DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant impact on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant impact on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on an earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

[signature]	4/3/23
Signature:	Date

Evaluation of Environmental Impacts:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less-than-significant Impact". The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

N. ISSUES:

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare that will adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE and FORESTRY RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agricultural farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which due to their location or nature, could individually or cumulatively result in the loss of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

IV. BIOLOGICAL RESOURCES: Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filing, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory	☐	☐	☐	☒

wildlife corridors, or impede the use of native wildlife nursery sites?				
e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of a unique archaeological resource as defined in §15064.5?	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. ENERGY: Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
VIII. GREENHOUSE GAS EMISSIONS Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport, will the project result in a safety hazard or excessive noise for people working or residing in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

X. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner, which would:	☐	☐	☐	☐
(i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site;	☐	☐	☒	☐
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
(iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐
XI. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigation an environmental effect?	☐	☐	☒	☐
XII. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XIII. NOISE: Would the project result in:				

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, will the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☐	☒
XVI. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational	☐	☐	☒	☐

facilities that might have an adverse physical effect on the environment?				
XVII. TRANSPORTATION: Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐
XVIII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1 (k), or	☐	☒	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the	☐	☐	☒	☐

	project's projected demand in addition to the provider's existing commitments?				
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e)	Comply with federal, state and local management and reduction statues and regulations related to solid waste?	☐	☐	☐	☒
XX.	**WILDFIRE:** If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a)	Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b)	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c)	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d)	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result or runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒
XXI.	**MANDATORY FINDINGS OF SIGNIFICANCE:**				
a)	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

O. Explanation of Issues

I. AESTHETICS: Would the project:

a) ***Have a substantial adverse effect on a scenic vista?*** **No Impact.** There are no state or County designated scenic vistas either within the boundary of the project, adjacent to or within direct view of the project that would be impacted by the project. Furthermore, neither the City of Calimesa nor the City of Yucaipa general plans designate any scenic resources or scenic corridors either on or adjacent to the project. The project would have no scenic vista impacts.

b) ***Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?*** **No Impact.** There are no state designated scenic highways and no scenic resources such as trees, rock outcroppings, or historic buildings within a state scenic highway that are either adjacent to or visible from the project that would be removed or altered by the project. The closest state designated scenic route to the project is the section of State Route 38 that is located south of State Route 18 in the San Bernardino Mountains that is approximately twenty miles north of the project. The project is not visible from this section of State Route 38 due to the elevation of the existing topography between State Route 18 and the project that prevents direct views of the site. The project would have no state scenic resource impact.

c) ***In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*** **Less Than Significant Impact.** The project is located in an urbanized area.[1] The project meets and complies with the existing City of Calimesa R-L-M Residential Low/Medium (4-7 DU/AC) zoning for the detention basin. The project also complies with the Calimesa D-V-C Downtown Village Commercial zone and Calimesa Creek Overlay for the proposed storm drain improvements and the proposed underground storm drain improvements in the City of Calimesa. The underground storm drain improvements proposed in the City of Yucaipa are located within the County Line Road right-of-way. The construction of the underground storm drain improvements in County Line Road would not have any visual impacts once the improvements are completed.

The project would change the visual character of the vacant land that is proposed for the construction of the detention basin. The project proposes to construct a fully improved detention basin that is approximately 25' deep on vacant land that is currently flat. The detention basin would be connected with the adjacent improved open storm channel with an inlet at the southeast corner and an outlet at the southwest corner of the basin. The basin itself measures approximately 430 feet wide and 300 feet long. An earthen berm would be constructed around the perimeter of the basin to increase its capacity with a maintenance road on the top of the berm for maintenance vehicle access. A 200' wide spillway is proposed at the south end of the basin adjacent to Calimesa Creek to allow water in the basin above a specific level to flow into the existing open storm drain channel. The bottom of the basin is approximately

[1] https://gis-portal.data.census.gov/arcgis/apps/MapSeries/index.html?appid=7a41374f6b03456e9d138cb014711e01

25' feet lower than the existing surface elevation. The sides of the basin would have slopes at of 2.5:1. A ramp at the northeast corner of the detention basin would provide access to the bottom of the basin for inspection and maintenance. An 8' chain link fence with barbed wire at the top is proposed along the project boundary to enclose the basin for security and safety purposes.

A water diversion structure is proposed within Calimesa Creek adjacent to and west of 5th Street. This concrete structure would allow low flow water in Calimesa Creek to be diverted west into the Calimesa Creek to maintain existing low water flows in the creek. The proposed water diversion structure also includes the proposed construction of a 78" underground storm drain that would extend to County Line Road and continue west to approximately 50' west of the intersection of County Line Road and Calimesa Boulevard where the underground storm drain would extend south to Calimesa Creek. The proposed diversion structure measures 6 feet wide, 6 feet deep and 30 feet in length. The diversion structure outlet measures 3 feet by 4.5 feet. The outlet is four feet in length transitions into a 36" reinforced concrete pipe (RCP) that would allow low flows in the creek to continue down the stream past the diversion structure. The diversion structure would be visible from both County Line Road and 5th Street. The top of the structure would not extend above the creek bank of Calimesa Creek.

The proposed underground storm drain would be out of public view once construction is completed. There would be short-term aesthetic impacts associated with the construction of both the detention basin and the underground storm drain with the presence of construction equipment, piles of excavated dirt, construction materials that are stored at the site, construction worker vehicles, etc. While the construction activities would impact the existing aesthetics of the area for approximately 120 days during construction of the detention basin and 60 days for the storm drain, the construction period is relatively short-term. Once construction is completed the construction equipment, storage of equipment and supplies, presence of construction workers and their vehicles, etc. would be removed from the site. All of the construction equipment, materials, etc. associated with the construction of the proposed storm drain facilities would be removed once construction is completed, the proposed fence around the detention basin would remain after construction is completed.

One of the goals of the Resource Management element of the Calimesa General Plan is to conserve and protect significant landforms and hillside areas.[2] The proposed detention basin is not on or adjacent to a hillside, therefore the site is not required to be protected and meet specific slope and visual design criteria.

Construction equipment would be visible during the construction of the detention basin, diversion structure, underground storm drain and creek bank improvements. To reduce potential impacts, Cities (both Calimesa and Yucaipa) will restrict work hours to 7:00am to 5:00pm, Monday thru Friday, except Holidays. The construction equipment that would be used to construct the project includes excavators, backhoes, bulldozers, and other construction equipment that is typical for the construction of underground storm drain improvement and detention basin projects. The project does not propose the use of cranes or any other large pieces of construction equipment. While the construction equipment would have short-term aesthetic impacts associated with the use of construction equipment during construction, the aesthetic impacts would cease upon completion of construction. The short-term aesthetic construction impacts would not be significant.

Overall, the construction of the detention basin and other storm drain improvements in the City of Calimesa would comply with the Resource Element of the Calimesa General Plan and have less than significant visual impacts. The construction of the storm drain in County Line Road would be underground

[2] City of Calimesa 2014 General Plan, Chapter 6: Resource Management, Goal RM-1, page 6-9.

and not visible once construction is completed. While the proposed detention basin is in the City of Calimesa, the basin would not be visible to motorists on County Line Road. The site is located more than 250' from County Line Road and is not visible from any other street. Overall, the project would not conflict with applicable zoning and other regulations governing scenic quality, and would have less than significant aesthetic impacts.

d) ***Create a new source of substantial light or glare that will adversely affect day or nighttime views in the area?*** **Less Than Significant Impact**. The project does not propose any short- or long-term outdoor lights or structures that would generate light. Glare would be generated by the construction equipment and construction materials that would be used during project construction. However, any glare generated during construction would be short-term and cease upon completion of the construction of the project. The project would have less than significant light or glare impacts.

II. AGRICULTURE AND FORESTRY RESOURCES: Would the project:

a) ***Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*** **No Impact.** The 4.5-acre site that is proposed for construction of the detention basin site is vacant and undeveloped. The detention basin is surrounded by single-family detached residences adjacent to and east, south and west of the site. Vacant land is located adjacent to and north of the proposed detention basin. The land uses adjacent to Calimesa Creek where the creek channel improvements are proposed include single-family detached residences and commercial uses west of 5th Street in the City of Calimesa. The land uses adjacent to County Line Road where the underground storm drain is proposed includes commercial uses in both the cities of Calimesa to the south and Yucaipa to the north. There are no agricultural uses either on or adjacent to the site.

The areas proposed for construction are designated "Urban and Built-Up Land" by the State of California Department of Conservation Riverside County Important Farmland 2016 map and the State of California Department of Conservation San Bernardino County Important Farmland 2016 map, respectively.[3] Because there are no agricultural uses either on or adjacent to the areas proposed for construction, the project would not convert prime, unique, or farmland of statewide importance to non-agricultural use and impact farmland.

b) ***Conflict with existing zoning for agricultural use, or a Williamson Act contract?*** **No Impact.** None of the properties that are proposed for construction are in a Williamson Act contract. The project would not conflict with any existing agricultural use or a Williamson Act contract.

c) ***Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*** **No Impact.** There is no timber land or forests in the City of Calimesa or Yucaipa. Therefore, the project would not impact any forest or timber production.

d) ***Result in the loss of forest land or conversion of forest land to non-forest use?*** **No Impact.** See Response to Section "II.c)" above.

[3] ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/riv16_w.pdf, ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/sbd16_so.pdf

e) ***Involve other changes in the existing environment, which due to their location or nature, could individually or cumulatively result in the loss of Farmland, to non-agricultural use?*** **No Impact.** There is no farmland either on or adjacent to the project. Therefore, the project would not result in the loss of or have any impact to farmland, either individually or cumulatively.

III. AIR QUALITY: Would the project:

a) ***Conflict with or obstruct implementation of the applicable air quality plan? Less Than Significant Impact.*** An air quality and greenhouse gas report [4] was prepared for the project. A copy of the report is attached in Appendix A. The report references the City of Calimesa's Climate Action Plan. The purpose of the plan was to integrate local planning efforts to reduce greenhouse gas (GHG) emissions and improve the quality of life in the community.

The City of Calimesa is located in the South Coast Air Basin (SCAB). The South Coast Air Quality Management District (SCAQMD) is the agency principally responsible for comprehensive air pollution control in the SCAB. As a regional agency, SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies regarding air emissions.

South Coast Air Quality Management District

The SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines and is directly responsible to reduce emissions from stationary, mobile, and indirect sources. It has prepared a sequence of Air Quality Management Plans (AQMPs) and on June 30, 2016 released its Draft 2016 AQMP, which is a regional blueprint to achieve federal air quality standards and healthful air. On March 23, 2017 the California Air Resources Board (CARB) approved the 2016 AQMP. The primary goal of the AQMP is to meet clean air standards and protect public health, including ensuring benefits to environmental justice and disadvantaged communities. The approved Plan has been forwarded to the U.S. Environmental Protection Agency for review. If approved by EPA, the plan becomes federally enforceable.

The California Environmental Quality Act (CEQA) Guidelines requires a discussion of any inconsistencies between a proposed project and applicable general plans, specific plans and regional plans (CEQA Guidelines Section 15125(d)). The regional plan that applies to the project includes the SCAQMD Air Quality Management Plan (AQMP). A discussion of the project's consistency with the Calimesa General Plan is provided in Section XI. Land Use of this document. This section discusses any potential inconsistencies of the project with the AQMP. The project must comply with and meet all applicable rules and regulations of the AQMP.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP". Strict consistency with all aspects of the plan is usually not required. A project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

[4] Air Quality and GHG Impact Analysis, Calimesa Creek Stage III Project, Giroux & Associates, February 15, 2022.

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP in 2016 or increments based on the year of project buildout and phase.

Both criteria are evaluated below.

CRITERIA 1 – INCREASE IN THE FREQUENCY OR SEVERITY OF VIOLATIONS

Based on the air quality modeling analysis contained in the air quality report that was prepared for the project (see Appendix A) the short-term construction impacts would not have any significant air emission impacts based on the SCAQMD regional and local thresholds of significance. The project includes the implementation of fugitive dust control and exhaust emissions control measures during construction. The project would have negligible operational emissions associated with the operation of routine storm drain and detention basin maintenance equipment once the project is constructed. Negligible operational emissions would be generated by the project. Therefore, the project would not contribute to the exceedance of any air pollutant concentration standards and is consistent with the AQMP for Criteria 1.

CRITERIA 2 – EXCEED ASSUMPTIONS IN THE AQMP

Consistency with the AQMP assumptions is determined by performing an analysis of the project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the project are based on the same forecasts as the AQMP. The 2016-2040 Regional Transportation/Sustainable Communities Strategy prepared by the Southern California Association of Governments (SCAG) (2016) includes chapters on: the challenges in a changing region; creating a plan for our future; and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA. For this project, the City of Calimesa's General Plan Land Use Plan defines the assumptions that are represented in the AQMP.

The proposed detention basin site is designated CC – Community Commercial (FAR 50:1) by the Calimesa General Plan and zoned C-C (Community Commercial). Calimesa Creek, which is proposed for improvements, is designated RH – Residential High (14-20 DU/AC), CR – Regional Commercial (FAR 75:1) and LI – Light Industrial land use by the City of Calimesa and zoned R-L-M Residential Low/Medium (4-7 DU/AC). The underground storm drain proposed within County Line Road is a public roadway. Calimesa Creek, which is proposed for a diversion structure, creek bank restoration and an underground storm drain is designated D-V-C Downtown Village Commercial with the Calimesa Creek Overlay.

The project would not require a general plan amendment or zone change. According to SCAQMD, a project is considered to be consistent with the AQMP if the project furthers one of more policies of the AQMP and does not obstruct other AQMP policies. In the case of the proposed project, the proposed storm drain improvements would reduce flooding and improve public safety in the project area. Generally, project compliance with SCAQMD emissions thresholds, reductions and control requirements, which the project meets, act to reduce project air emissions. The project's compliance with all applicable SCAQMD air quality standards during construction allows the project to meet and comply with the AQMD. The proposed detention basin and other flood-control improvements would also not generate emissions in exceedance of the aforementioned allowed uses. Therefore, the project would not exceed the AQMP assumptions for the project site and is consistent with the AQMP for Criteria 2. The project would have no impact to the AQMP.

b) ***Result in a cumulatively considerable net increase of any criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard?* Less Than Significant Impact.** Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources that travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered, would cover an even larger area.

The project site is located within the SCAB, which is non-attainment for ozone and PM_{10} particulate matter. The emissions generated with the construction and operation of cumulative projects would further degrade the local air quality, as well as the air quality of the SCAB. The greatest cumulative impact on the regional air quality is the incremental addition of pollutants in the SCAB mainly from increased traffic by residential, commercial, and industrial development and the use of heavy equipment and trucks to construct these projects. Air quality would be temporarily degraded during construction activities that occur separately or simultaneously. However, in accordance with the SCAQMD methodology, projects that do not exceed the SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.

As stated in section “III.c)” below, the project would not generate any short-term air emissions that exceed SCAQMD emission thresholds. Therefore, the project would not have any significant cumulative criteria pollutant impacts.

c) ***Expose sensitive receptors to substantial pollutant concentrations*? Potentially Significant Unless Mitigation Incorporated.** A sensitive receptor is a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant. The following are land uses (sensitive sites) where sensitive receptors are typically located:

- Schools, playgrounds and childcare centers
- Long-term health care facilities
- Rehabilitation centers
- Convalescent centers
- Hospitals
- Retirement homes
- Residences[5]

The closest sensitive receptors to the detention basin are the residents adjacent to and east, south and west of the site. There are also residents in close proximity to the proposed underground storm drain improvements proposed for County Line Road and Calimesa Creek.

[5] South Coast Air Quality Management District, Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning, Chapter 2, page 2-1.

Criteria Pollutants, Health Effects, and Standards

Under the Federal Clean Air Act (FCAA), the U.S. EPA has established National Ambient Air Quality Standards (NAAQS) for six major pollutants; ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. These six air pollutants are often referred to as the criteria pollutants. The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property).

Under the California Clean Air Act, the California Air Resources Board has established California Ambient Air Quality Standards (CAAQS) to protect the health and welfare of Californians. State standards have been established for the six criteria pollutants as well as four additional pollutants; visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

Table 1 presents the state and national ambient air quality standards. A brief explanation of each pollutant and their health effects is presented in the Table 1 footnotes.

Monitored Air Quality

Long-term air quality monitoring is carried out by the SCAQMD at various monitoring stations. The SCAQMD has divided the South Coast Air Basin into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The closest air monitoring station to the project is the Redlands air monitoring station that is less than one mile west of the proposed detention basin. However, this station only monitors ozone and large particulates. The closest station that monitors the full spectrum of pollutants is the Central San Bernardino station that is located approximately eighteen miles northwest of the project. Table 2 summarizes the last four years of published data from the Redlands and Central San Bernardino monitoring stations.

As shown in Table 2, ozone and particulates are the two most significant air quality concerns. Ozone is the primary ingredient in photochemical smog. Slightly less than 16 percent of all days exceed the California one-hour standard. The 8-hour state ozone standard has been exceeded an average of 26 percent of all days in the past four years. The federal 8-hour standard is exceeded 17 percent of all days.

Air Emission Thresholds

The SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD California Environmental Quality Act (CEQA) Handbook states that any project in the South Coast Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes of this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds shown in Table 3.

Table 1
Ambient Air Quality Standards [6]

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 $\mu g/m^3$)		0.070 ppm (137 $\mu g/m^3$)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	12.0 $\mu g/m^3$	15 $\mu g/m^3$	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemiluminescence	100 ppb (188 $\mu g/m^3$)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^3$)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 $\mu g/m^3$)	
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 $\mu g/m^3$ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 $\mu g/m^3$		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

See footnotes on next page …

For more information please call ARB-PIO at (916) 322-2990 California Air Resources Board (5/4/16)

[6] Appendix A – Air Quality and GHG Impact Analysis, Calimesa Creek Stage III Project, Cities of Calimesa and Yucaipa, California, dated February 15, 2022, Page 3.

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

For more information please call ARB-PIO at (916) 322-2990 **California Air Resources Board (5/4/16)**

Table 2
Air Quality Monitoring Summary (2017-2020)[7]

Pollutant/Standard	2017	2018	2019	2020
Ozone				
1-Hour > 0.09 ppm (S)	79	53	73	104
8-Hour > 0.07 ppm (S)	114	94	109	141
8- Hour > 0.075 ppm (F)	60	66	88	127
Max. 1-Hour Conc. (ppm)	0.156	0.136	0.137	0.173
Max. 8-Hour Conc. (ppm)	0.135	0.114	0.117	0.136
Carbon Monoxide				
8- Hour > 9. ppm (S,F)	0	0	0	0
Max 8-hour Conc. (ppm)	2.3	2.5	1.1	1.4
Nitrogen Dioxide				
1-Hour > 0.18 ppm (S)	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.065	0.057	0.059	0.054
Inhalable Particulates (PM-10)				
24-hour > 50 $\mu g/m^3$ (S)	2/59	2/59	0/59	1/40
24-hour > 150 $\mu g/m^3$ (F)	0/59	0/59	0/59	0/40
Max. 24-Hr. Conc. ($\mu g/m^3$)	77.	74.	44.	57.
Ultra-Fine Particulates (PM-2.5)				
24-Hour > 35 $\mu g/m^3$ (F)	1/116	0/114	0/97	0/115
Max. 24-Hr. Conc. ($\mu g/m^3$)	38.2	30.1	34.8	25.7

Source: South Coast AQMD Air Monitoring Station Data Summary
Redland Monitoring Station: Ozone, PM-10
San Bernardino 4th Street Monitoring Station: CO, NOx, PM-2.5

Table 3
SCAQMD Daily Emissions Thresholds of Significance

Pollutant	Construction	Operations
ROG	75	55
NOx	100	55
CO	550	550
PM-10	150	150
PM-2.5	55	55
SOx	150	150
Lead	3	3

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

[7] Appendix A – Air Quality and GHG Impact Analysis, Calimesa Creek Stage III Project, Cities of Calimesa and Yucaipa, California, dated February 15, 2022, Page 8.

Additional Indicators

In its CEQA Handbook, the SCAQMD also states that additional indicators should be used as screening criteria to determine the need for further analysis with respect to air quality. The additional indicators are as follows:

- A project could interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation
- A project could result in population increases within the regional statistical area which would be in excess of that projected in the AQMP and in other than planned locations for the project's build-out year.
- A project could generate vehicle trips that cause a CO hot spot.

Short-Term Construction Impacts

Construction activities necessary to develop the project, including the construction of the retention basin, 18", 24", 54", 72" and 78" underground storm drains, box culverts, roadway crossings and grade the creek bank slopes of Calimesa Creek to protect adjacent properties from a 100-year storm event would generate air emissions, toxic air contaminant emissions, and odors during construction. The project construction activities include grading for the detention basin, removal of pavement and excavation in County Line Road for the construction of the underground storm drain, and other storm drain improvements.

CalEEMod was developed by the SCAQMD to provide a model to calculate construction emissions and operational emissions for a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions. Although exhaust emissions would result from the operation of on- and off-site motorized equipment, the exact types and numbers of equipment would vary among contractors such that emissions cannot be quantified with certainty. Project construction emissions were estimated by using CalEEMod2016.3.2 computer model to identify the maximum daily emissions for each pollutant during project construction based on the type and number of pieces of construction equipment necessary to develop the project and the estimated time to construct the project. The estimated construction fleet required to construct the project is shown in Table 4.

Table 4
Construction Activity Equipment Fleet

Detention Basin 120 days Export 31,000 CY earthworks	1 Excavator
	1 Dozer
	1 Scraper
	1 Loader
	1 Water Truck
Storm Drain Installation 60 days	2 Excavators
	1 Loader
	1 Backhoe
	1 Water Truck
Tie-Ins 30 days	1 Excavator
	1 Loader
	1 Backhoe
Low-Flow Diversion Structures 60 days	1 Mixer
	1 Pump
	1 Excavator
	1 Loader/Backhoe

Referencing the construction equipment fleet and durations shown in Table 4, the worst-case daily construction emissions were calculated by CalEEMod2020.4.0 and are shown in Table 5.

Table 5
Construction Activity Emissions
Maximum Daily Emissions (pounds/day)

Maximal Construction Emissions	ROG	NOx	CO	SO_2	PM-10	PM-2.5
2022						
Detention Basin	2.4	25.9	18.0	0.1	4.0	2.4
Storm Drain	1.2	10.7	12.3	0.0	0.5	0.4
Tie-Ins	0.5	1.7	5.8	0.0	0.2	0.2
Diversion Structures	0.6	1.7	6.9	0.0	0.3	0.3
Total	**4.7**	**40.0**	**43.0**	**0.1**	**5.0**	**3.3**
SCAQMD Thresholds	75	100	550	150	150	55

As shown in Table 5, peak daily construction activity emissions are calculated to be below SCAQMD CEQA thresholds without the need for air emission reduction mitigation measures. The only mitigation measure that was included in the CalEEMod2020.4.0 air model program was watering exposed dirt surfaces two times a day to minimize the generation of fugitive dust during grading activities as required by SCAQMD.

Construction equipment exhaust emissions contain carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24-hour per day, 365 days per year, 70-year lifetime exposure. The SCAQMD does not generally require the analysis of construction-related diesel emissions relative to health risk due to the short period for which the majority of diesel exhaust would occur. Health risk analyses are typically assessed over a 9-, 30-, or 70-year timeframe and not over a relatively brief construction period due to the lack of health risk associated with such a brief exposure as is the case with the proposed project.

As shown in Table 5 the project would not exceed and would be below ozone precursor thresholds for ROG and NOx. However, because the region is non-attainment for photochemical smog, the use of reasonably available for diesel exhaust emission control measures are recommended as shown below:

Mitigation Measure No. 1 All engine powered construction equipment shall implement the following exhaust emission control measures throughout construction:

- Utilize well-tuned off-road construction equipment.
- Establish a preference for contractors using Tier 3 or better rated heavy equipment.
- Enforce 5-minute idling limits for both on-road trucks and off-road equipment.

Mitigation Measure No. 2 Fugitive Dust Control:

- Apply soil stabilizers or moisten inactive areas.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically 2-3 times/day).
- Cover all stock piles with tarps at the end of each day or as needed.
- Provide water spray during loading and unloading of earthen materials.
- Minimize in-out traffic from construction zone.
- Cover all trucks hauling dirt, sand, or loose material and require all trucks to maintain at least two feet of freeboard.
- Sweep streets daily if visible soil material is carried out from the construction site.

Localized Significance Thresholds

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Localized Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005.

For the project, the primary source of a possible LST impact would be during project construction only since the project would not generate any operational emissions once the project is constructed. LSTs are applicable for a sensitive receptor where it is possible that an individual could remain for 24 hours such as a residence, hospital or convalescent facility, which in this case the existing residents adjacent to the project are considered sensitive receptors

LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

LST screening tables are available for 25, 50, 100, 200 and 500-meter source-receptor distances. For the proposed project the nearest sensitive receptors are the residences adjacent to and east and south of the detention basin and south of the diversion structure, therefore the most conservative 25-meter distance was modeled.

The SCAQMD has issued guidance on applying CalEEMod to LSTs. LST pollutant screening level concentration data is currently published for 1, 2 and 5-acre sites for varying distances. Because construction of a storm drain is linear, equipment only operates in front of any single residence for a short period of time (progress rate is estimated to be 100 linear feet per day). The most stringent thresholds for a 1-acre site were applied for the construction of the storm drain. Because the detention basin is larger, a threshold for a 4-acre site was referenced. Table 6 shows the estimated LST emissions and thresholds for the construction of the proposed detention basin, 18”, 24”, 54”, 72”, and 78” underground storm drains, box culverts, roadway crossings and grade the slopes of Calimesa Creek to protect adjacent properties from a 100-year storm event.

Table 6
LST and Project Emissions (pounds/day)

Storm Drain LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	12	11	1	1

Detention Basin LST

LST 4 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	1,677	325	11	7
Max On-Site Emissions	18	26	4	2

Tie-Ins LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	6	2	1	1

Diversion Structures LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	7	2	1	1

The project LSTs were compared to the maximum daily construction activities. As shown in Table 6, project construction emissions would be less than the LST construction thresholds. Therefore, the project LSTs are less than significant.

SCAQMD's Rule 403

The project would be required by SCAQMD to comply with rules to reduce fugitive dust emissions during project construction. Specifically, project compliance with Rule 403 is achieved through the application of standard best management practices during construction and operation activities, which include the application of water or chemical stabilizers to disturbed soils, manage haul road dust by the use of water, cover haul vehicles, restrict vehicle speeds on on-site unpaved roads to 15 mph, sweep loose dirt from paved site access roadways, stop construction activity when wind speeds exceed 25 mph and establish a permanent ground cover on finished areas.

Operational Air Emission Impacts

Once constructed, the proposed detention basin would require minimal maintenance such as periodic clearing silt and/or debris from the basin. As a result, the long-term operational air emissions associated to inspect and maintain the detention basin would be negligible. Similarly, once constructed the proposed diversion and tie-in structures would require minimal maintenance during the life of the project. The long-term operational air emissions associated to inspect and maintain the diversion and tie-in structures would be negligible. The operational emissions associated with the project would be less than significant.

As shown in the above tables, the project would not generate any air emissions during project construction that would exceed SCAQMD thresholds. Because the project would not generate any construction air emissions that exceed adopted construction emission thresholds, sensitive receptors adjacent to the project would not be exposed to substantial pollutant concentrations. Project construction emissions would be less than significant and not significantly impact any sensitive receptors adjacent to or in the project vicinity.

d) ***Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*** **Less Than Significant Impact.** Potential sources for odors during project construction include the application of materials such as asphalt pavement and diesel exhaust emissions from the operation of diesel-powered construction equipment. The objectionable odors that would be generated during the construction process would be short-term and any odor emissions would cease upon the drying or hardening of the odor producing materials (asphalt pavement) or ceasing operation of the diesel construction equipment. Diesel exhaust and VOCs would be emitted during construction of the project, which are objectionable to some. However, emissions would disperse rapidly from the project site and therefore would not reach an objectionable level at the nearest sensitive receptors. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant odor impacts are anticipated during project construction.
Once project construction is completed the project would not generate any emissions or odors and impact area residents or commercial uses. The project would not have any significant odor impacts.

IV. BIOLOGICAL RESOURCES: Would the project:

a) ***Have substantial adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?*** **Less Than Significant With Mitigation.** A biological report[8] and a aquatics resources delineation report[9] were prepared for the project and copies are included in Appendix B.

The project includes both a detention basin and drainage conveyance facilities. The proposed detention basin site is vacant and has been disturbed by mowing, tilling and disced for weed abatement and fire prevention. Calimesa Creek, between 3rd and I-10 is an ephemeral drainage feature. Project surface elevations range from approximately 2,485 feet above mean sea level at the detention basin to approximately 2,385 feet above mean sea level where Calimesa Creek passes underneath I-10.

Based on the biological site survey that was conducted on September 20, 2019, there were no federally or state listed special-status plant species identified. One non-listed special-status species, southern California black walnut (Juglans californica), which has a California Rare Plant Rank of 1B.1, was observed along the bank of Calimesa Creek within the project site. However, this species is covered in the County of Riverside Multi Species Habitat Conservation Plan (MSHCP). No federally or state listed or other special-status plant species have a moderate or high potential to occur within the project site.[10]

Five bird species were detected within the study area. No active bird nests were observed during the project site reconnaissance. However, the ornamental vegetation and native vegetation (i.e., Fremont cottonwood forest) within the study area provides habitat for nesting birds and raptors. No amphibian species were observed, and no amphibian species are expected to occur. One reptile species was observed during the survey that included the common side-blotched lizard (Uta stansburiana). Three mammal species were detected during the survey including the California ground squirrel (Spermophilus (Otospermophilus) beecheyi), desert cottontail (Sylvilagus audubonii), and domestic dog (Canis lupus familiaris).[11]

The survey was conducted outside of the nesting season. However, the study area provides potential nesting habitat for commonly occurring birds such as Anna's hummingbird (Calypte anna) or house finch. The study area does include large trees (e.g., eucalyptus, tree of heaven, black locust, coast live oak) suitable for raptor nesting.[12]

While the survey area included habitat potentially suitable for Riverside fairy shrimp, the proposed project has been designed to avoid that area. The biological site survey did not identify any federally or state listed wildlife species within the proposed construction area. In addition, no other special-status wildlife species with a moderate or higher potential to occur on the site were identified.[13] However, thirteen special-status wildlife species have a low potential to occur within the study area, including the state fully

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8 Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project, City of Calimesa, Riverside County, Dudek, October 18, 2019.
9 Calimesa Creek Stage III Project Aquatics Resources Delineation Report, City of Calimesa, Riverside County, Dudek, November 2020
10 Ibid, page 9.
11 Ibid, page 9.
12 Ibid, page 10.
13 Ibid.

protected white-tailed kite (Elanus leucurus). The white-tailed kite has a low potential to nest and forage within the study area and this species is covered under the MSCHP.

Because wildlife species could be impacted by the project the following mitigation measures are recommended.

Mitigation Measure No. 3 To maintain compliance with the Migratory Bird Treaty Act and California Fish and Game Code, if ground-disturbing and/or vegetation clearance activities are scheduled to occur during the avian nesting season (typically February 15 through August 31), the City of Calimesa shall require that a pre-construction nesting bird survey be conducted by a qualified biologist within the project impact footprint and a 500-foot buffer where legal access is granted around the disturbance footprint within 3 days prior to initiation of activity.

If an active nest is detected during the nesting bird survey, avoidance buffers shall be implemented as determined by a qualified biologist. The buffer shall be of a distance to ensure avoidance of adverse effects to the nesting bird by accounting for topography, ambient conditions, species, nest location, and activity type. All nests shall be monitored as determined by the qualified biologist until nestlings have fledged and dispersed or it is confirmed that the nest has been unsuccessful or abandoned. The qualified biologist shall halt all construction activities within proximity to an active nest if it is determined that the activities are harassing the nest and may result in nest abandonment or take. The qualified biologist shall also have the authority to require implementation of avoidance measures related to noise, vibration, or light pollution if indirect impacts are resulting in harassment of the nest.

Mitigation Measure No. 4 If suitable potential fairy shrimp habitat exists and cannot be avoided, the City of Calimesa shall conduct protocol-level focused surveys (i.e., two seasons) pursuant U.S. Fish and Wildlife Service Survey Guidelines for the Listed Large Branchiopods (May 31, 2015) to determine presence/absence. If focused-protocol level survey results are positive, and the project cannot permanently avoid fairy shrimp habitat, a Determination of Biologically Equivalent or Superior Preservation report shall be required to propose mitigation that demonstrates equivalent or superior function and value. In accordance with MSHCP Table 9-2, Objective 4 for vernal pool fairy shrimp and Objective 3 for Riverside fairy shrimp, if the survey results are positive, at least 90% of the area with long-term conservation value shall be conserved on-site.

b) ***Have substantial adverse impact on any riparian habitat or other natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?*** **Less Than Significant Impact With Mitigation.** An aquatic resources delineation report[14] was prepared for the project and a copy is included in Appendix B.

Based on the aquatic resources delineation report, there are approximately 3.1-acres of California Department of Fish and Wildlife and RWQCB jurisdictional resources and 2.7-acres of non-riparian (i.e. riverine) streambed within the project site.[15] The riparian habitat consists of Fremont cottonwood forest alliance and includes a greater than 5% absolute cover of Fremont cottonwoods. The Freemont cottonwood riparian vegetation is narrow and small in its extent and lacks understory or closed-canopy features. However, this community also includes a high cover of the tree of heaven, scattered emergent coast live oaks and eucalyptus trees. The understory is sparse and includes non-native grasses, including brome species.[16] This riparian habitat also lacks continuity with higher quality habitat, and is not contiguous; therefore, it is not sufficient to support riparian bird species such as least Bell's vireo (Vireo bellii pusillus), southwestern willow flycatcher (Empidonax traillii extimus), or yellow-billed cuckoo (Coccyzus americanus).[17]

The MSHCP defines riparian/riverine areas as "lands which contain habitat dominated by trees, shrubs, persistent emergent, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year." The MSHCP further clarifies those areas "demonstrating characteristics as described above which are artificially created are not included in these definitions" (County of Riverside MSHCP 2003).

There are approximately 3.31 acres of MSHCP riparian/resources within the project site that includes 2.94 acres of riverine resources and 0.37 acres of riparian habitat. Calimesa Creek conveys water ultimately connecting to Temescal Canyon Wash west of the project, west of Interstate 10, that ultimately flows to the Santa Ana River approximately fourteen miles northwest of the project site. Because Calimesa Creek conveys water to downstream resources it is considered riverine resources as defined by the MSHCP. Additionally, the associated Fremont cottonwood forest would be considered a riparian resource as defined by the MSHCP.

The project may have potential impacts to jurisdictional resources. The following mitigation measures are recommended to reduce potential impacts to less than significant.

Mitigation Measure No. 5 If jurisdictional waters are impacted as a result of project implementation, the City of Calimesa shall obtain all appropriate permits pursuant to Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers, a Water Quality Certification pursuant to Section 401 of the Clean Water Act from the Regional Water Quality Control Board, and a Streambed Alteration Agreement from CDFW pursuant to Sections 1600–1616 of the California Fish and Game Code.

[14] Calimesa Creek Stage III Project Aquatics Resources Delineation Report, Dudek, November 2020.
[15] Ibid, page D-2.
[16] Ibid, pages D-2, D-3.
[17] Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project, City of Calimesa, Riverside County, Dudek, October 18, 2019, page 12.

All mitigation measures and conditions contained within the above permits shall be implemented. At a minimum, the following shall be completed for mitigation for impacts to waters of the state and jurisdictional streambed:

1. Compensation for Permanent Impacts: Permanent impacts to waters of the state and jurisdictional streambeds shall be offset by compensation at a minimum of a 1:1 ratio, or as otherwise required by the respective permits.

2. Temporary Impacts: All areas temporarily impacted shall be restored to native grade and contour and revegetated with native species as determined by an adjacent reference site or through documentation of baseline conditions prior to impacts.

3. Best Management Practices. Avoided jurisdictional waters shall be fenced or flagged as environmentally sensitive areas. Best management practices shall be implemented to avoid indirect impacts to jurisdictional waters, including the following:

   a. Vehicles and equipment shall not operate in ponded or flowing water except as described in the permits.

   b. Water containing mud, silt, or other pollutants from grading or other activities shall not be allowed to enter jurisdictional waters or placed in locations that may be subjected to high storm flows.

   c. Spoil sites shall not be located within 30 feet from the boundaries of jurisdictional waters or in locations that may be subject to high storm flows, where spoils might be washed back into drainages.

   d. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources resulting from project-related activities shall be prevented from contaminating the soil and/or entering avoided jurisdictional waters.

   e. No equipment maintenance shall occur within 150 feet of jurisdictional waters and no petroleum products or other pollutants from the equipment shall be allowed to enter these areas or enter any off-site state-jurisdictional waters under any flow.

Mitigation Measure No. 6 If the project cannot demonstrate avoidance of MSHCP Section 6.1.2 riparian habitat or riverine resources in perpetuity, a Determination of Biologically Equivalent or Superior Preservation Report shall be required and propose mitigation that demonstrates equivalent or superior function and value. This document shall be reviewed, approved, and coordinated with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife prior to the start of construction.

The project will maintain flow to existing channel – larger flow will be conveyed through the storm pipe. The flow diversion will not impact habitat or wetlands.

c) ***Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filing, hydrological interruption, or other means?*** **No Impact.** Based on the aquatic resources delineation report there are no wetlands within the project site.[18] The project will not impact downstream waters. The project detains flow and releases them over a longer duration and delivers flow to downstream areas using an alternative path.

d) ***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*** **Less Than Significant Impact.** Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal. The project site is not within any designated wildlife corridors and/or habitat linkages. The project site is isolated from designated wildlife corridors/habitat linkages and other open spaces by substantial developed areas and heavily traversed roadways, including Interstate 10. Although waters from Calimesa Creek flow into San Timoteo Creek, Calimesa Creek is an ephemeral drainage, with a relatively small watershed that is highly developed so native fish species are not expected to be present or use the creek within the project site for upstream or downstream movement.

On a local level, the project site is located in an area that dominated with development that support minimal vegetation (particularly native vegetation). Calimesa Creek bisects the study area; however, the natural portions of the creek west of I-10 are primarily limited to the project area. Waters from Calimesa Creek flow downstream from the project site into underground culverts beneath Calimesa Boulevard and continue approximately 500 feet under Interstate 10. The project site may provide local movement for some urban-adapted wildlife species (i.e., coyote, striped skunk, raccoon, opossum), but these species would be expected to be able to use similar urban habitat that is adjacent to the project site.[19] Because the project site is not directly connected to any natural open space areas that are known to support wildlife and does not serve as a migratory wildlife corridor or a wildlife nursery, the project will have a less than significant impact on wildlife corridors or migratory wildlife species.

e) ***Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?*** **Less Than Significant With Mitigation.** Calimesa Municipal Code (CMC) Section 18.70.120 provides guidelines for the removal of all species of trees with the exception of oak trees, which are regulated by Chapter 18.80 of the Municipal Code.

The biological resources report did not identify any oak trees on the project site.[20] However, oak trees are known to exist within the immediate project vicinity and although the project does not propose and is not anticipated to remove any trees that would fall within CMC Section 18.70.120 or oak trees per Chapter 18.80, any trees that would be removed by the project would be required to meet and comply with CMC Section 18.70.120 or Chapter 18.80.

[18] Calimesa Creek Stage III Project Aquatics Resources Delineation Report, Dudek, October 2019, page 2.
[19] Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project, City of Calimesa, Riverside County, Dudek, October 18, 2019, page 10.
[20] Ibid, Table 1, page 6.

The following mitigation measure is recommended to reduce potential impacts with the removal of any oak trees to less than significant.

Mitigation Measure No. 7 An oak tree survey shall be conducted 30-days prior to the start of any construction to determine if any oak trees would be removed. If oak trees would be removed, their removal would have to be removed in compliance with Calimesa Municipal Code (CMC) Section 18.70.120.

f) ***Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*** **Less Than Significant With Mitigation.** The City of Calimesa is located within the Western Riverside County Multiple Species Habitat Conservation Plan area, but is not located in a Criteria Cell. Therefore, a Joint Project Review process is not required, and no further discussion regarding Reserve Assembly is required. However, the project is still required to demonstrate consistency with the MSHCP.

For Section 6.1.2 Riparian/Riverine and Vernal Pool Resources, the project will implement avoidance, minimization, and mitigation measures for impacts to Riparian and Riverine resources, as required for Vernal Pools and Fairy Shrimp as shown in the Biological Study.

For Section 6.1.3 Narrow Endemic Plant Species Survey Area and Section 6.3.2 Additional Survey Needs and Procedures. The project is not located within these Sections and no additional survey re+quirements for these biological resources apply.

Section 6.1.4 Urban Wildlands Interface Guidelines. Although the project is not located within an MSHCP Criteria Cell nor any conserved areas of the MSCHP, Calimesa Creek flows into Timoteo Creek west of Calimesa that is a conservation area. Therefore, because Calimesa Creek has a connectivity to Timoteo Creek the project must comply with the Urban/Wildlife Interface Guidelines of the MSHCP.[21] The following mitigation measures are recommended to reduce potential significant impacts to the MSHCP.

Mitigation Measure No. 8 As a signatory to the Western Riverside Multiple Species Habitat Conservation Plan, the City of Calimesa shall pay a local development mitigation fee prior to the issuance of a grading or construction permit, whichever is issued first, at the rates applicable at the time of payment of the fee as set forth in the most recent fee schedule.

Mitigation Measure No. 9 The project is not within any conserved areas; however, Calimesa Creek flows to San Timoteo Creek, which ultimately flows to the Santa Ana River. Due to the proposed project having connectivity to areas described for conservation, the Urban/Wildlife Interface Guidelines are applicable. Prior to the start of any construction, the City of Calimesa shall implement the following Urban Wildlands Interface Guidelines (MSHCP, Section 6.1.4) to minimize and avoid indirect effects from development adjacent to MSHCP Conservation Areas, where applicable:

- Drainage: The project shall incorporate measures, including measures required through the National Pollutant Discharge Elimination System (NPDES) requirements, to ensure that the quantity and quality of runoff

[21] Ibid, page 12.

discharged to the MSHCP Conservation Area is not altered in an adverse way when compared with existing conditions. In particular, measures shall be put in place to avoid discharge of untreated surface runoff from developed and paved areas into the MSHCP Conservation Area. Stormwater systems shall be designed to prevent the release of toxins, chemicals, petroleum products, exotic plant materials or other elements that might degrade or harm biological resources or ecosystem processes within the MSHCP Conservation Area. This can be accomplished using a variety of methods including natural detention basins, grass swales or mechanical trapping devices. Regular maintenance shall occur to ensure effective operations of runoff control systems.

- Toxics: Land uses proposed in proximity to the MSHCP Conservation Area that use chemicals or generate bioproducts such as manure that are potentially toxic or may adversely affect wildlife species, Habitat or water quality shall incorporate measures to ensure that application of such chemicals does not result in discharge to the MSHCP Conservation Area. Measures such as those employed to address drainage issues shall be implemented.

- Lighting: Night lighting shall be directed away from the MSHCP Conservation Area to protect species within the MSHCP Conservation Area from direct night lighting. Shielding shall be incorporated in project designs to ensure ambient lighting in the MSHCP Conservation Area is not increased.

- Noise: Proposed noise generating land uses affecting the MSHCP Conservation Area shall incorporate setbacks, berms or walls to minimize the effects of noise on MSHCP Conservation Area resources pursuant to applicable rules, regulations and guidelines related to land use noise standards. For planning purposes, wildlife within the MSHCP Conservation Area should not be subject to noise that would exceed residential noise standards.

- Invasives: When approving a landscape plan for the detention basin the City of Calimesa shall consider the invasive, non-native plant species listed in [MSHCP] Table 6-2 and shall require revisions to landscape plans (subject to the limitations of their jurisdiction) to avoid the use of invasive species for the portions of the detention basin that are adjacent to the MSHCP Conservation Area. Considerations in reviewing the applicability of this list shall include proximity of planting areas to the MSHCP Conservation Areas, species considered in the planting plans, resources being protected within the MSHCP Conservation Area and their relative sensitivity to invasion, and barriers to plant and seed dispersal, such as walls, topography and other features.

- Barriers: For those land uses adjacent to the MSHCP Conservation Area the City of Calimesa shall incorporate barriers, where appropriate to minimize unauthorized public access, domestic animal predation, illegal trespass or dumping in the MSHCP Conservation Area. Such barriers may include native landscaping, rocks/boulders, fencing, walls, signage and/or other appropriate mechanisms.

- Grading/Land Development: Manufactured slopes shall not extend into the MSHCP Conservation Area.

Mitigation Measure No. 10 The following best management practices, as applicable, shall be implemented for the duration of construction:

- A condition shall be placed on grading permits requiring a qualified biologist to conduct a training session for project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the Endangered Species Act (Act) and the MSHCP, the need to adhere to the provisions of the Act and the MSHCP, the penalties associated with violating the provisions of the Act, the general measures that are being implemented to conserve the species of concern as they relate to the project, and the access routes to and project site boundaries within which the project activities must be accomplished.

- Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.

- The footprint of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.

- The upstream and downstream limits of a project's disturbance plus lateral limits of disturbance on either side of the stream shall be clearly defined and marked in the field and reviewed by the biologist prior to initiation of work.

- Projects shall be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

- Projects that cannot be conducted without placing equipment or personnel in sensitive habitats shall be timed to avoid the breeding season of riparian species identified in MSHCP Global Species Objective No. 7.

- When stream flows must be diverted, the diversions shall be conducted using sandbags or other methods requiring minimal instream impacts. Silt fencing of other sediment trapping materials shall be installed at the downstream end of construction activity to minimize the transport of sediments off site. Settling ponds where sediment is collected shall be cleaned out in a manner that prevents the sediment from reentering the stream. Care shall be exercised when removing silt fences, as feasible, to prevent debris or sediment from returning to the stream.

- Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project related spills of hazardous materials shall be reported to appropriate entities including but not limited to applicable jurisdictional city, USFWS, CDFG, and RWQCB and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.

- Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.

- The qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint.

- The removal of native vegetation shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.

- Exotic species that prey upon or displace target species of concern shall be permanently removed from the site to the extent feasible.

- To avoid attracting predators of the species of concern, the project site shall be kept as clean of debris as possible. All food related trash items shall be enclosed in sealed containers and regularly removed from the site(s).

- Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed project footprint and designated staging areas and routes of travel. The construction area(s) shall be the minimal area necessary to complete the project and shall be specified in the construction plans. Construction limits will be fenced with orange snow screen. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.

- The City of Calimesa shall have the right to access and inspect the project site, including any restoration/enhancement area for compliance with project approval conditions, including these best management practices.

V. CULTURAL RESOURCES: Would the project:

a) ***Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?*** **No Impact.** A cultural resource assessment[22] was conducted for the project and a copy is attached as Appendix C. In addition, Tribal consultation and required mitigation are also enclosed in Appendix C.

There are no buildings on the project site. Furthermore, there are no recorded National Register of Historic Places (NRHP), California Historical Landmarks (CHL) or California Points of Historical Interest (CPHI) properties within the project site, or within a one-mile radius of the site.

There is, however, a concrete storm drain structure in Calimesa Creek that extends under Calimesa Boulevard south of County Line Road. The storm drain was formed and poured with concrete with steel (rebar). A header over the entrance to the storm drain has a cast date of "1930". This structure was constructed for the sole purpose to convey seasonal flows in Calimesa Creek under Calimesa Boulevard and constructed in 1930 using modern materials and techniques.

The storm drain structure was evaluated for significance under criteria based on two separate, but overlapping legislative sources: (1) the National Historic Preservation Act of 1966 (NHPA), which includes criteria for eligibility to the National Register of Historic Places (NRHP); and (2) CEQA that includes criteria for eligibility to the California Register of Historical Resources (CRHR).

Research indicates the storm drain is not associated with any historic event that is important to the regional history of California or the United States. As such, the storm drain structure is not considered a historical resource under Section 15064.5 of the CEQA Guidelines. Research also indicates the storm drain is not eligible for listing in either the NRHP or the CRHR.

Based on the results of the records search and site surveys the project would not impact historical resources.

b) ***Cause a substantial adverse change in the significance of a unique archaeological resource as defined in §15064.5?*** **Less Than Significant Impact With Mitigation.** A records search was conducted at the Eastern Information Center at University of California at Riverside and the Archaeological Information Center at the San Bernardino County Museum. Both records searches indicated that no prehistoric or historic archaeological sites have been recorded within the limits of Calimesa Creek and within the project site.

Field reconnaissance of the creek channel and detention basin were conducted. The results of the field surveys were negative and no prehistoric resources were discovered on the site. Based on the results of the records search and site surveys the project would not have any significant cultural resource impacts.

[22] Update Cultural Resources Assessment of the Calimesa Channel, State 3 Project, City of Calimesa, Riverside County, California, Archaeological Associates, November 2019.

The San Manuel Band of Mission Indians, as documented in the City of Calimesa letter dated March 25, 2020, identified the potential for tribal cultural resources to be located within the project site and if present, the potential for tribal cultural resources to be impacted during construction. As a result, the following mitigation measures are recommended.

Mitigation Measure No. 11 Due to the heightened cultural sensitivity of the proposed project area, an archaeological monitor with at least 3 years of regional experience in archaeology shall be present for all ground-disturbing activities that occur within the proposed project area (which includes, but is not limited to, tree/shrub removal and planting, clearing/grubbing, grading, excavation, trenching, compaction, fence/gate removal and installation, drainage and irrigation removal and installation, hardscape installation [benches, signage, boulders, walls, seat walls, fountains, etc.], and archaeological work). A sufficient number of archaeological monitors shall be present each workday to ensure that simultaneously occurring ground disturbing activities receive thorough levels of monitoring coverage. A Monitoring and Treatment Plan that is reflective of the project mitigation ("Cultural Resources" and "Tribal Cultural Resources") shall be completed by the archaeologist and submitted to the Lead Agency for dissemination to the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI). Once all parties review and approve the plan, it shall be adopted by the Lead Agency – the plan must be adopted prior to permitting for the project. Any and all findings will be subject to the protocol detailed within the Monitoring and Treatment Plan.

With mitigation presented impacts will be less than significant.

c) ***Disturb any human remains, including those interred outside of formal cemeteries?*** **No Impact.** The project site is not presently used as a formal cemetery and is not known to have been used as a cemetery in the past. In addition, the site is not known to have been used for any activities that have resulted in human remains being present on the site. In the unexpected event human remains are encountered, activities would be required to comply with Health and Safety Code 7050.5 and Public Resources Code 5097. Health and Safety Code requires construction or excavation be halted in the vicinity of any potential human remain discovery and the corner be contacted. In accordance with Public Resources Code, the corner would be required to notify the Native American Heritage Commission if the remains are potentially Native American to determine the most likely decedent to determine how to proceed. Adherence to these regulations ensure no impact would occur. The project would not impact human remains.

VI. ENERGY: Would the project:

a) ***Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*** **Less Than Significant Impact.** Information found in this section, as well as other aspects of the project's energy implications, are discussed in greater detail in section "VII" (Greenhouse Gas Emissions) of this MND. Considering the project consists of drainage improvements, project energy use would occur primarily during the construction phase and operational emissions would be negligible. As such, the following project impact analysis focuses on energy use during construction.

Construction-Related Energy Consumption

Estimated Energy Consumption

Heavy-duty construction equipment associated with trenching, grading and the construction of the detention basin, diversion structure and storm drain facilities would include the operation of excavators, bulldozers, scrapers, front-end loaders, water trucks, etc. The majority of the equipment would likely be diesel-fueled; however, smaller equipment, such as air compressors may be electric, gas, or natural gas-fueled. For the purposes of this assessment, it is assumed that the construction equipment would be diesel-fueled, due to the speculative nature of specifying the amounts and types of non-diesel equipment that might be used, and the difficulties in calculating the energy, which would be consumed by this non-diesel equipment.

The number of construction workers required to construct the project would vary based on the phase of construction and the activity taking place. The transportation fuel required by construction workers to travel to and from the site would depend on the total number of worker trips estimated for the duration of construction activity. A 2007 study by the California Department of Transportation (Caltrans) estimates the statewide average fuel economy for all vehicle types (automobiles, trucks, and motorcycles) in the year 2020 is 18.78 miles per gallon.[23]Assuming construction worker vehicles have an average fuel economy consistent with the Caltrans study and each construction worker commutes an average of 20 miles a day to and from the site, the maximum 20 workers on-site during each phase of the project is estimated to consume approximately 21 gallons of gasoline a day. Assuming all 20 construction workers are employed at the site for a total of 180 days, (120 days to construct the detention basin and 60 days to construct the underground storm drain), the fuel used by construction workers commuting to the site is approximately 96 barrels (3,834 gallons) of gasoline and represents less than 0.0003 percent of the statewide transportation gasoline consumption in 2016, which is the latest year that data is available.[24]
Construction equipment fuels (e.g., diesel, gasoline, natural gas) would be provided by local or regional suppliers and vendors. Electricity would be supplied by the local utility provider (e.g., Southern California Edison) via existing connections. A temporary water supply, primarily for fugitive dust suppression and street sweeping, would also be supplied by the local water service provider.

Electricity used during construction to provide temporary power for lighting and electronic equipment (e.g., computers, etc.) inside temporary construction trailers and for outdoor lighting when necessary for general construction activity would generally not result in a substantial increase in on-site electricity use. Electricity use during construction would be temporary and vary depending on the lighting needs of the project and the use of electric-powered equipment. Most of the electricity that would be required would

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[23] 2007 California Motor Vehicle Stock, Travel and Fuel Forecast, California Department of Transportation, Table 1, (2008).
[24] California 2015 Transportation gasoline consumption – 348,830 thousand barrels; https://www.eia.gov/state/seds/sep_fuel/html/pdf/fuel_mg.pdf

be provided by portable on-site generators rather than provided the Southern California Edison. As a result, the electricity consumed during project construction would be considered negligible.

Energy Conservation: Regulatory Compliance

The project would utilize construction contractors who must demonstrate compliance with applicable CARB regulations governing the accelerated retrofitting, repowering, or replacement of heavy-duty diesel on- and off-road equipment. CARB has adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other TACs. Compliance with the above anti-idling and emissions regulations would result in a more efficient use of construction-related energy and minimize or eliminate wasteful and unnecessary consumption of energy.

Solid Waste

With respect to solid waste, CALGreen requires 65% of most construction and demolition waste be diverted from a landfill. The project would generate various types of debris during project demolition and construction. Concrete and asphalt that is removed from the site during trenching in County Line Road can either be ground and reused on the site as base material or sold to a recycler.

The City of Calimesa follows the Riverside County Solid Waste Management Plan regarding solid waste collection and recycling. In addition, as required by Assembly Bill 939 (AB 939) the solid waste generated by the project would be recycled and the materials that cannot be recycled would be hauled to the San Timoteo landfill that is located approximately 11 miles southwest of the project. Project compliance with CALGreen and the County Solid Waste Management Plan would reduce and conserve energy consumption regarding solid waste recycling during both project construction. The project would not generate any solid waste once the proposed improvements are constructed.

The project would not result in wasteful or inefficient energy use and will comply with Calgreen Solid Waste Disposal requirements. Therefore, the project will have less than significant impacts.

b) ***Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*** **No Impact.** Once constructed, the project would not consume or require any energy. Therefore, the project would not conflict with or obstruct state or local renewable energy or energy efficiency requirements.

VII. GEOLOGY AND SOILS: Would the project:

a) ***Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:***

i. ***Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)*** **Potentially Significant Unless Mitigation Incorporated.** A geotechnical report was prepared for the project.[25] In addition, a supplemental geotechnical report was prepared to update the initial geotechnical report.[26] A copy of both geotechnical reports is attached in Appendix D.

The project site, like the majority of southern California, is located in a seismically active area. The project is not located in a State of California Earthquake Fault Zone.[27] The historical seismicity of the project site entails numerous small to medium magnitude earthquake events occurring around the site, predominately associated with the San Andreas and San Jacinto fault zones. Any development at the site should anticipate that moderate to large seismic events could occur very near the site.[28] –

The Banning fault separates from the San Andreas fault north of the city of Indio and extends through the Banning-Beaumont pass area into the Calimesa area. While some reports claim that the Beaumont fault has been inactive since earliest Pleistocene time (1.8 million years ago), the State of California has placed the Calimesa portion of the Banning fault within an Earthquake Fault Zone on their maps of the Alquist-Priolo Earthquake Fault Zones of California. At its closest approach, the Banning fault lies approximately 2,100 feet southwest of the project (Matti and Morton, 2010 and Matti, et al, 2003).[29]

Another known active fault is the Chicken Hill fault that is located approximately 3.7 kilometers (2.3 miles) northwest of the project. The Chicken Hill fault is considered part of numerous faults collectively called the Crafton Hills Complex. The Crafton Hills Complex is comprised of numerous intra faults created by the interaction of the San Andreas fault to the northeast and the San Jacinto fault to the southwest.

While there are large earthquake faults within a 100-kilometer (62 mile) radius of the project, none of the faults are considered as relevant to the project as the Banning and Chicken Hill faults discussed above, due to their greater distance and smaller anticipated magnitudes.[30]

Neither the geotechnical report nor the supplemental geotechnical report identified any potentially significant impacts to the project due to earthquake faulting. Therefore, the project would not have any significant earthquake faulting impacts.

[25] Preliminary Soils Investigation, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., December 20, 2019.
[26] Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., January 29, 2020.
[27] Ibid, page 4.
[28] Ibid, page 6.
[29] Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., January 29, 2020, page 2.
[30] Ibid, page 5.[31] Ibid, page 6.

ii. ***Strong seismic ground shaking?*** **Less Than Significant Impact.** Because the project site is located in southern California and a seismically active area, there is the potential for ground motion at the site as discussed in Section "VII.a) i" above.

The historical seismicity of the site identifies numerous small to medium magnitude earthquake events occurring around the project site, predominately associated with the presence of the San Andreas and San Jacinto fault zones. Future development at the project site should anticipate that moderate to large seismic events could occur very near the site.[31]

A slope stability analysis was performed for the slopes proposed for the detention basin. Based on the slope stability analysis, a seismic safety factor greater than 1.0 should be used for the construction of the slopes for the detention basin.[32]

Project compliance with the seismic recommendation in the preliminary soils investigation for the construction of the detention basin slopes and all applicable faulting and seismic regulations required by the California Building Code (CBC) would reduce potential seismic ground shaking impacts to less than significant.

iii. ***Seismic-related ground failure, including liquefaction?*** **Less Than Significant Impact.** The project is not located in a state designated Zone of Required Investigation for Liquefaction. Based on the geotechnical report, the project site is underlain by relatively medium dense to dense older alluvial materials and the depth to groundwater is thought to be in excess of 50 feet. Therefore, the possibility of liquefaction at the site is considered to be nil.[33] As a result, the project would not be significantly impacted by liquefaction.

iv. ***Landslides?*** **No Impact.** The project site and the area adjacent to and immediately surrounding the site is basically flat. There are no hills or other topographic relief features either on or adjacent to the site that would impact the project due to a landslide. The project site is not located within an area that is designated by the State of California as a Zone of Required Investigation for Earthquake-Induced Landslides. Due to the low relief of the site and surrounding region the potential for landslides to occur at the site is considered nil.[34] The project would not be exposed to or impacted by a landslide.

b) ***Result in substantial soil erosion or loss of topsoil?*** **Less Than Significant Impact.** The City would require the grading and construction contractor to install and maintain all applicable City required short-term construction soil erosion control measures to reduce and minimize soil erosion impacts throughout project grading and construction. The contractor would be required to submit a Storm Water Pollution Prevention Plan (SWPPP) to identify all Best Management Practices (BMPs) that would be incorporated into the project prior to the start of grading and maintained throughout project construction to reduce and minimize soil erosion. The City has standard soil erosion protection measures that the contractor would be required to install and maintain throughout grading and construction to minimize off-site soil erosion. The requirement by the City for the contractor to install all applicable mandated soil erosion control measures into the project prior to the start of construction and maintain those soil erosion control

[31] Ibid, page 6.
[32] Preliminary Soils Investigation, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., December 20, 2019, page 5.[33] Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., January 29, 2020, page 6.
[33] Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., January 29, 2020, page 6.
[34] Ibid, page 7.

measures throughout project construction would minimize and reduce potential soil erosion impacts to less than significant.

c) ***Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*** **Less Than Significant Impact.** Based on the supplemental geotechnical investigation, there are no known unstable geologic or soil conditions, including liquefaction, on- or off-site landslides, or seismic induced settlement, either on or adjacent to the site that would impact the project.[35] Therefore, the project would not be significantly impacted by unstable soil conditions.

d) ***Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?*** **Less Than Significant Impact.** Based on the geotechnical report, the majority of the site surficial soils consist of silty sands, minor units of well graded sand and poorly graded sand, and trace units of clayey sand and sandy silt. The granular units of silty sand, well graded sand and poorly graded sand are considered to have a very low expansion potential. The finer grained units of clayey sand and sandy silt are anticipated to have a very low to low expansion potential.[36] As a result, the project would have a less than significant impact due to expansive soils.

e) ***Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?*** **No Impact.** The project does not propose the construction of septic tanks or any alternative wastewater disposal systems. The project would generate wastewater during project construction that would be served by portable toilets. The portable toilets would be removed upon completion of construction. The project would not require the construction of a septic tank or any other alternative wastewater disposal system. The project would not have any wastewater disposal impacts.

f) ***Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*** **Less Than Significant Impact.** The Calimesa General Plan states that the potential for paleontological resources would occur in the San Timoteo formation. Based on the geotechnical report the San Timoteo formation does not exist on the site Most of the project site, with the exception of the proposed detention basin, has been disturbed either due to the construction of the existing underground utilities in County Line Road or erosion associated with Calimesa Creek. Any paleontological resources that may have existed in County Line Road or Calimesa Creek where construction is proposed has in all likelihood been disturbed. As a result, the project is not anticipated to have any significant paleontological resource impacts.

VIII. GREENHOUSE GAS EMISSIONS: Would the project:

a) ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*** **Less Than Significant Impact.** A greenhouse gas report is included in the air quality report and included in Appendix A.

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." Greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by

[35] Ibid, pages 6-7.
[36] Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California, LOR Geotechnical Group, Inc., January 29, 2020, page 7.

transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and nitrous oxide (NOx) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean.

City of Calimesa

The City of Calimesa prepared a Climate Action Plan (CAP) in September 2014.[37] The purpose was to integrate local planning efforts to reduce GHG emissions and improve the quality of life in the community. There are no recommendations or action items to reduce construction GHG emissions in the Calimesa CAP that would apply to the proposed project. Therefore, since the project results in GHG construction emissions below the SCAQMD 3,000 ton/year threshold, the project would not conflict with any applicable plan, policy, or regulation to reduce GHG emissions.

Thresholds of Significance

In response to the requirements of California SB 97, the California Natural Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or
- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the CEQA Guidelines specifies how the significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of step, the GHG guidelines afford the lead agency with substantial flexibility.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons (MT) CO_2 equivalent/year. In September 2010, the SCAQMD CEQA Significance Thresholds GHG Working Group released revisions, which recommended a threshold of 3,000 MT CO_2e for all land use projects. This 3,000 MT/year recommendation is used as a guideline for the GHG analysis for the proposed project. In the absence of an adopted numerical threshold of significance, project related GHG emissions in excess of the guideline level are presumed to trigger a requirement for enhanced GHG reduction at the project level.

[37] City of Calimesa Climate Action Plan, September 2014.

Construction Activity GHG Emissions

The CalEEMod2020.4.0 computer model that was used to calculate the annual CO_2e construction emissions for the project are shown in Table 7. SCAQMD policy for GHG construction emissions is to amortize the emissions over a 30-year lifetime. As shown, the amortized CO2e construction emissions are less than significant.

Table 7
Construction Emissions (Metric Tons CO_2e)

Year 2022	CO_2e
Detention Basin	304.3
Storm Drain	78.6
Tie-Ins	15.6
Diversion Structures	28.9
Total	**427.4**
Amortized	**14.2**

CalEEMod Output provided in Appendix A of Air Quality/Greenhouse Gas report

b) ***Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*** **Less Than Significant Impact.**

In June 2005 the California Governor issued Executive Order S-3-05, GHG Emission that established the following GHG reduction targets:

- 2010: Reduce greenhouse gas emissions to 2000 levels
- 2020: Reduce greenhouse gas emissions to 1990 levels
- 2050: Reduce greenhouse gas emissions to 80 percent below 1990 levels.

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006 that requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020 through an enforceable statewide emission cap, which were phased in starting in 2012.

As shown previously in Table 7 the project's estimated GHG emissions are estimated to be 395.2 MTCO2e per year and below the 3,000 MT/year threshold for compliance with Executive Order S-3-05. Because the project meets the current interim emissions targets/thresholds established by SCAQMD the project would also meet the reduction target of 40 percent below 1990 levels by 2030 mandated by SB-32. Furthermore, the majority of the post 2020 reductions in GHG emissions are addressed via regulatory requirements at the State level and the project would be required to comply with the regulations as they come into effect.

At a level of 395.2 $MTCO_2e$ per year, the project's GHG emissions are below the SCAQMD screening threshold of 3,000 $MTCO_2e$ per year for both AB-32 and SB-32. Therefore, project construction GHG emissions would not impact and conflict with any applicable plan, policy, or regulations to reduce GHG emissions.

Once constructed, the proposed detention basin would require minimal maintenance such as periodic clearing silt and/or debris from the basin. As a result, the long-term operational GHG emissions associated to inspect and maintain the detention basin would be negligible. Similarly, once constructed the proposed diversion and tie-in structures would require minimal maintenance during the life of the project. The long-term operational GHG emissions associated to inspect and maintain the diversion and tie-in structures would be negligible. The operational GHG emissions with the project would be less than significant.

IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) ***Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*** **Less Than Significant Impact.** A Phase I Environmental Site Assessment (ESA)[38] was prepared for the project site. A copy of the Phase I ESA is attached in Appendix E.

The Phase I ESA includes an environmental site assessment of the proposed 4.6-acre detention basin that is located approximately 150 feet west of 3rd Street and adjacent to and north of Calimesa Creek. The Phase I ESA does not include an investigation of any portions of Calimesa Creek that are proposed for construction or the construction of underground storm drains in Calimesa Road or County Line Road.

Based on the Phase I ESA, there is no evidence of any recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), or controlled recognized environmental conditions (CRECs) indicative of releases or threatened releases of hazardous substances either on, at, in, or to the site. However, two potential environmental concerns were noted during a review of historical aerial photographs that include:

- The presence of agricultural grove in the central and southern portions of the subject site (approximate lower two-thirds) in 1938, gone by 1949.

- In the 1950s, within the east portion of the subject site, particularly in the approximate east one-third of the subject site, was natural vegetative growth, numerous smaller objects and possibly small piles of materials or disturbed soils, and some dirt drives or roads. The nature of the activities associated with this portion of the subject site is undetermined. Currently, there is no onsite evidence of these historical activities.

The above potential environmental concerns are not anticipated to have had a significant environmental impact to the site. However, the only way to confirm this conclusion is to perform soil sampling and analysis. In order to confirm there are no hazardous materials such as herbicides and/or pesticides present on the former agricultural grove on the central and southern portion of the site or hazardous materials within the one-third eastern portion of the site is to conduct soil testing. The following mitigation measures are recommended to mitigate potential hazardous soil impacts on the site.

[38] Phase I Environmental Site Assessment, Proposed Calimesa Channel Basin Stage III, 4.6+ Acres of Vacant Land, Portions of APNs 410-030-049 Through -052, Calimesa, Riverside County, California, LOR Geotechnical Group, Inc., December 5, 2019.

Mitigation Measure No. 12 Prior to the issuance of any construction or grading permits for the former agricultural grove on the central and southern portion of the site or hazardous materials within the one-third eastern portion of the site soil the City shall take samples to determine if hazardous materials are present. If hazardous materials are present, the City shall remove or remediate in place all identified hazardous materials in compliance with all applicable local, County, State and Federal laws and regulations.

The project does not propose the use of any hazardous materials, except those hazardous materials that are typically used during construction activities, including the storage and use of diesel fuel to power construction equipment, oil and other lubricants that are used to operate construction equipment. The contractor would be required by all applicable state and local laws and regulations regarding the transportation, storage and use of diesel fuel, oil and other construction equipment lubricants during project construction. Therefore, the project would not create any significant hazards through the transport, use or disposal of any hazardous materials.

b) ***Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*** **No Impact.** There are no short-term uses or activities associated with the construction of the project that would create or release hazardous materials into the environment. The project would not have any hazard impacts to the public or environment involving the release of a hazardous material.

c) ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*** **No Impact.** The closest existing school to the project is Calimesa Elementary School that is located at 13523 2nd Street in Yucaipa and approximately one-half mile northeast of the detention basin. There are no other existing or proposed schools within one-quarter mile of the project.

The hazardous materials that would be used during project construction include diesel fuel and lubricants for the construction equipment. Any construction equipment related hazardous materials that would be used on-site during project construction are required by law to be stored and locked in a safe area. The project contractor would be responsible for the safe use and storage of all hazardous materials during project construction. The storage and use of any hazardous materials to operate and maintain the construction equipment in compliance with all applicable state and local laws and regulations would not have any hazardous emission impacts to Calimesa Elementary School.

d) ***Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, will create a significant hazard to the public or environment?*** **No Impact.** Based on the Phase I ESA, the project site is not listed as a hazardous material site on the "Cortese" list pursuant to Government Code Section 65962.5. The project would not have a hazardous impact to the public or environment with the development of the site per Government Code Section 65962.5.

e) ***For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport, will the project result in a safety hazard or excessive noise for people working or residing in the project area?*** **No Impact.** The Redlands Municipal Airport is located at 1755 Sessums Drive in the City of Redlands is located approximately seventeen miles northwest of the project and the closest airport to the site. Due to the distance of the project from the

Redlands Municipal Airport, the project construction workers would not be impacted by airport noise or exposed to any significant safety impacts.

f) ***Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*** **Potentially Significant Unless Mitigation Incorporated.** County Line Road serves as an emergency response route for both the cities of Calimesa and Yucaipa. The proposed underground storm drain in County Line Road could impact the response times of emergency responders that would have to travel on County Line Road during project construction. The Calimesa Emergency Response Plan (EOP) designates County Line Road as a primary emergency route. Similarly, the City of Yucaipa also designates County Line Road as a primary emergency response route. Emergency vehicles from both the City of Calimesa and Yucaipa that are responding to an emergency could be delayed if they have to travel along County Line Road where construction of the underground storm drain is proposed and have a significant impact. The following mitigation measure is recommended to reduce potential emergency evacuation impacts to less than significant.

Mitigation Measure No. 13 Prior to the start of construction in County Line Road the project contractor shall submit an emergency response plan to the City of Calimesa Engineer and Fire Department and the City of Yucaipa that provides safe and unobstructed passage on County Line Road for emergency vehicles to pass safely along this section of roadway during under construction. Both the City of Calimesa and the City of Yucaipa shall approve the emergency response plan prior to the start of any construction in County Line Road.

g) ***Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*** **No Impact.** Based on the analysis in Section "XIX.a)" in this MND, the project site is not located within a designated Very High Fire Hazard Severity Zones in Local Responsibility Areas or State and Federal Responsibility Areas. Therefore, the project would not be exposed to or be impacted by a wildland fire.

X. HYDROLOGY AND WATER QUALITY: Would the project:

a) ***Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*** **Less Than Significant Impact.**

Silt would be generated from the site during site preparation, grading and the construction of the detention basin, diversion structure and underground storm drains, especially if construction occurs during the winter months when rainfall typically occurs. The Storm Water Pollution Prevention Plan (SWPPP) requires the contractor to implement Best Available Technology Economically Achievable measures to reduce and eliminate storm water pollution from all construction activity through the implementation of Best Management Practices (BMPs). The City of Calimesa requires the project contractor to prepare a SWPPP in accordance with California State Water Resources Control Board (State Water Board), Construction General Permit Order 2009-0009-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS618033 (Permit) because the project is located in the Santa Ana MS4 Permit for the portion of the Santa Ana River watershed located within Riverside County (Order No. R8-2010-0033.

Mitigation Measure No. 14 Prior to grading permit issuance, the Project proponent shall have a Storm Water Pollution Prevention Plan (SWPPP) prepared pursuant to the statewide Construction General Permit by a Qualified SWPPP Developer (QSD). Also, a receipt of fees paid with the SWPPP Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) shall be provided to the City of Calimesa. The SWPPP shall be implemented onsite by a Qualified SWPPP Practitioner (QSP). Project contractors shall comply with the SWPPP and allow inspection of the construction site by staff from the Regional Water Quality Control Board and Cities of Calimesa and/or Yucaipa or their designee(s) to confirm compliance.

The installation of and the regular maintenance of the BMP's required by the SWPPP would reduce storm water runoff pollutants generated from construction to less than significant.

b) ***Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*** **No Impact.** The project proposes to incorporate dust control measures during all construction activities in compliance with SCAQMD Rule 403 Fugitive Dust. The amount of water that would be required to control dust during grading and construction would be minimal and not significantly impact existing groundwater supplies due to the small scale of the project. Once completed, the project would not consume any water, including groundwater.

The project proposes to construct a detention basin that would detain runoff during periods of high runoff flow in Calimesa Creek adjacent to the detention basin and allow runoff in the detention basin to percolate and recharge the local groundwater. Based on the hydrology report the project is estimated to detain up to 53 acre-feet of stormwater in the detention basin to reduce downstream flows and future flooding in Calimesa Creek. While detained, some of the stormwater would percolate into the soil and recharge the local groundwater. The project would have a positive impact to local groundwater by recharging the local groundwater with stormwater in the detention basin and improve the sustained management of the groundwater basin.

c) ***Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner, which would:***

i ***Result in substantial erosion or siltation on- or off-site?*** **Less Than Significant Impact.** As discussed above, silt would be generated from the site during grading and construction of the detention basin, diversion structure and the underground storm drain improvements, especially if construction occurs during the winter months when rainfall typically occurs. The implementation of Mitigation Measure 15 by the project contractor would reduce potential downstream erosion and/or siltation impacts to less than significant.

ii ***Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site?*** **No Impact.** The project proposes to construct a 4.6-acre detention basin adjacent to and north of Calimesa Creek and approximately 150 feet west of 3rd Street that would capture peak storm water flows in Calimesa Creek upstream of 3rd Street that currently flows downstream in Calimesa Creek and impact the existing storm drain facilities and property in and adjacent to Calimesa Creek from 3rd Street to Interstate 10. The proposed detention basin is designed to contain a 100-year storm in Calimesa Creek of 812 cubic feet per second (cfs) and greater and divert stormwater back into Calimesa Creek at a rate of 375 cfs. A reduction of 437 cfs would reduce stormwater impacts to the existing storm drain facilities downstream of the detention basin, see Hydrology Study, Appendix F.[39] In addition, the proposed low flow diversion structure in Calimesa Creek west of 5th Street and the construction of the proposed underground storm drain in County Line Road would reduce existing peak storm water flows in Calimesa Creek at Interstate 10 from 1,052 cfs to 663 cfs. The proposed detention basin, low flow diversion structure and underground storm drain in County Line Road would have a positive impact by reducing flooding that currently occurs in Calimesa Creek by reducing flows in the creek during periods of high stormwater flow. The project would substantially decrease existing flooding impacts in Calimesa Creek from 3rd Street to Interstate 10. The project would have a positive impact to reduce flooding and high storm water flows in Calimesa Creek compared to the existing condition.

iii ***Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*** **No Impact.** As discussed above, the project would have a positive impact by reducing existing flooding impacts that occur in Calimesa Creek and the local storm drain system from 3rd Street on the east to Interstate 10 to the west. The proposed detention basin, low flow diversion structure and underground storm drain in County Line Road collectively would reduce 100-year storm water flows in the existing storm drain facilities in Calimesa Creek and have a positive impact to the existing storm drain facilities.

The project would not generate additional sources of polluted water. As discussed in Section "X.a)" above, a SWPPP would be prepared as required by State law that would identify BMPs that would be installed prior to the start of any construction to remove and prevent stormwater pollutants upstream of 3rd Street that are diverted into the detention basin from reentering Calimesa Creek. The installation and long-term maintenance of the BMPs in compliance with the SWPPP would reduce and filter most storm water runoff pollutants from exiting the detention basin. The project would have a positive impact on the capacity of the existing storm water drainage system downstream of the project by reducing storm water flow into the existing storm drain facilities and improve the water quality of the storm water in Calimesa Creek downstream of the proposed detention basin. Overall, the project would have a positive impact on the existing Calimesa Creek storm drain system from 3rd Street to Interstate 10 and the quality of the runoff downstream of the proposed detention basin.

iv ***Impede or redirect flood flows?*** **No Impact.** The project would have a positive impact on storm water flows in Calimesa Creek downstream of 3rd Street to Interstate 10 by directing storm water flows upstream of 3rd Street into a proposed detention basin west of 3rd Street that would control and reduce existing stormwater flows in Calimesa Creek downstream of the proposed detention basin. A reduction in stream flows downstream of the detention basin by up to 437 cfs would significantly reduce existing flooding in Calimesa Creek from 3rd Street to Interstate 10.

d) ***In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*** **No impact.** There are no bodies of water adjacent to or in close proximity to the project site that could impact the project due to a seiche. The site is more than 50 miles northeast of the Pacific Ocean and approximately 2,400' above mean sea level. Thus, the project site would not be impacted by a tsunami. The proposed storm drain improvements would reduce existing flooding impacts to properties and storm drain facilities downstream of the detention basin due to a 100-year storm. While there are no known pollutants in or adjacent to Calimesa Creek, the construction of the proposed storm drain improvements would reduce potential flooding to downstream properties and indirectly reduce and minimize the future

[39] Calimesa Channel Storm Drain Improvement Project Stage III, Hydrology Study, Calimesa, California 92320, TKE Engineering, April 2019.

risk of the release of any pollutants that may be present adjacent to Calimesa Creek downstream of the project. The project would not be impacted by a seiche or tsunami and would not risk the release of pollutants.

e) **Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? No Impact.** The construction of the proposed detention basin would temporarily detain high storm water flows in Calimesa Creek at 3rd Street. The proposed detention basin would allow high stormwater flows in Calimesa Creek that currently flow downstream to be detained and allowed to percolate into the soil and recharge the local groundwater in greater amounts that allowed with the current conditions. Once directed into the detention basin from Calimesa Creek, stormwater could percolate and further recharge local groundwater and improve groundwater management. The project would not have conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan.

XI. LAND USE AND PLANNING: Would the project:

a) ***Physically divide an established community?*** **Less Than Significant Impact.** The project is an infill site surrounded by residential, commercial and public uses in the cities of Calimesa and Yucaipa. The detention basin is proposed to be constructed on private property and the underground storm drain, diversion structure and other storm drain improvements are proposed to be constructed within Calimesa Creek and public streets. The project would not significantly impact the established communities of the cities of Calimesa or Yucaipa.

b) ***Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*** **Less Than Significant Impact.** The Calimesa General Plan land use map designates the detention basin as CC – Community Commercial (FAR 50:1). The section of Calimesa Creek between 3rd Street on the east and Interstate 10 on the west is within the RH – Residential High (14-20 DU/AC), CR – Regional Commercial (FAR 75:1) and DVC – Downtown Village Commercial Park land use designations. County Line Road is a public roadway with the southern half of the road and in the City of Calimesa and the northern half of County Line Road is in the City of Yucaipa. The proposed detention basin is zoned C-C (Community Commercial). Calimesa Creek from 3rd Street to Interstate 10 is included in the Downtown Business District and zoned D-V-C Downtown Village Commercial with the Calimesa Creek Overlay. The underground storm drain that is proposed in County Line Road is within a public roadway. Both cities allow the construction of utilities, including underground storm drains, in County Line Road. The proposed storm drain improvements are consistent with the land use and zoning designations for the areas that are proposed for construction. The project would not require a general plan amendment or zone change.

The following goals, policies and action items of the Calimesa Infrastructure and Public Services Element of the General Plan are applicable to the project:

Goal IPS-3 - Ensure that adequate flood control facilities are provided prior to or concurrent with development.

Policy IPS-4 - Require the designation, preservation, maintenance, and acquisition of land and improvements necessary for flood control facilities, in accordance with the City's Master Flood Control and Drainage Plan.

Action Item IPS-4.4 for Policy IPS-4 - Where possible, preserve drainage courses in their natural condition to provide adequate safety and protection of residents and property.

In addition, the Safety Element of the General Plan provides goals, policies and action items for safety hazards associated with flooding. The following Safety Element goals and policies are applicable to the project:

Goal SAF-1 - Minimize injury, loss of life, property damage, and other impacts caused by safety hazards of all types.

Policy SAF-6 - All development shall comply with the flood control requirements of the City, as well as of the county, state, and federal governments.

Action Item SAF-6.5 of Policy SAF-6 - Provide drainage improvements according to the City's Master Flood Control and Drainage Plan to reduce the threat of inundation to developed areas of the city.

The proposed storm drain improvements meet and are consistent with applicable goals, policies and action items of the Calimesa Public Service and Safety elements of the General Plan. The proposed storm drain improvements would provide safety and protection to city residents and property and provide drainage improvements consistent with the City's Master Flood Control and Drainage Plan while preserving some of the existing natural drainage of Calimesa Creek.

The project will have less than significant land use impacts.

XII. MINERAL RESOURCES: Would the project:

a) ***Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*** **No Impact.** The Calimesa General Plan and the Yucaipa General Plan do not identify any locally important minerals either on or adjacent to the area proposed for construction. There are no mining activities either within or adjacent to the area proposed for the storm drain improvements. The project would not result in the loss of or impact any locally important mineral resources.

b) ***Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*** **No Impact.** See Response to Section "XII.a)" above.

XIII. NOISE: Would the project result in:

a) ***Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?*** **Less Than Significant Impact.** A noise report[40] was prepared for the project and a copy is attached in Appendix G.

Regulations

Federal

The U.S. EPA Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five (5) dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA Ldn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments.

State

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. The OPR Guidelines include a Noise and Land Use Compatibility Matrix that identifies acceptable and unacceptable community noise exposure limits for various land use categories.

California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. Two of these standards apply to what is referred to as a "substantial increase" in ambient noise levels. The City does not have a definition of a substantial increase, nor does CEQA establish a

[40] Acoustical Impact Analysis, Calimesa Creek Stage III Project, City of Calimesa, October 8, 2019.

numerical value for this threshold. Noise generated by transportation sources propagates differently than noise generated by point sources. Therefore, for purposes of this analysis, the following thresholds were used to evaluate the project's potential to result in substantial increases in ambient noise levels.

City of Calimesa Noise Standards

The City of Calimesa provides noise exposure limits in Section 8.15.040 of the Calimesa Municipal Code for stationary noise sources in close proximity to noise sensitive uses and are shown in Table 8.

Table 8
Calimesa Sound Level Limits

<table>
<tr><th>Zone</th><th colspan="2">Applicable Limit One-Hour Average Sound Level (In Decibels)</th></tr>
<tr><td rowspan="2">R-1, R-T, R-2, R-R and S-P regulations with a density of five dwelling units or less per acre</td><td>10:00 p.m. to 7:00 a.m.</td><td>40</td></tr>
<tr><td>7:00 a.m. to 10:00 p.m.</td><td>50</td></tr>
<tr><td rowspan="3">R-3, S-P and PRD regulations with a density of six or more dwelling units per acre</td><td>7:00 a.m. to 7:00 p.m.</td><td>55</td></tr>
<tr><td>7:00 p.m. to 10:00 p.m.</td><td>50</td></tr>
<tr><td>10:00 p.m. to 7:00 a.m.</td><td>45</td></tr>
<tr><td rowspan="3">C-P-S, C-P, C-O</td><td>7:00 a.m. to 7:00 p.m.</td><td>60</td></tr>
<tr><td>7:00 p.m. to 10:00 p.m.</td><td>55</td></tr>
<tr><td>10:00 p.m. to 7:00 a.m.</td><td>55</td></tr>
<tr><td rowspan="2">M</td><td>7:00 a.m. to 10:00 p.m.</td><td>70</td></tr>
<tr><td>10:00 p.m. to 7:00 a.m.</td><td>50</td></tr>
</table>

Noise from the operation of construction equipment is exempt from the regulations in Table 8. However, construction noise is required to adhere to noise standards as stated in Section 8.15.080 of the Calimesa Municipal Code as stated below:

> "It is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 7:00 a.m. or after 7:00 p.m. In addition, it is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on Saturdays and Sundays, January 1st, the last Monday in May, known as "Memorial Day," July 4th, the first Monday in September, Thanksgiving Day and December 25th. When January 1st, July 4th, or December 25th fall on a Sunday, it is unlawful for any person to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on the following Monday"

In addition to the daytime construction requirements, the Calimesa Municipal Code also requires that construction related noise not exceed a level of 75 dBA for more than 8 hours during a 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.[41] There are permissible deviations to this standard if construction only occurs sporadically as shown in Table 9.

Table 9
Construction Noise Levels Adjustments

Total Duration in 24 Hours	Decibel Level Allowance	Total Decibel Level
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+9	84
Up to 2 hours	+6	81
Up to 4 hours	+3	78
Up to 8 hours	0	75

City of Yucaipa Noise Standards

Yucaipa Municipal Code Section 87.0905 outlines the noise standards applicable to projects within its jurisdiction. Table 10 shows the City of Yucaipa noise standards.

Table 10
Yucaipa Noise Standards

Affected Land Use	Applicable Sound Level (In Decibels)	
Residential	Anytime	55
Professional Services	Anytime	55
Other Commercial	Anytime	60
Industrial	Anytime	70

Yucaipa Municipal Code Section 87.0905(e), exempts noise from temporary construction, repair, or demolition activities between 7 a.m. and 7 p.m., except Sundays and Federal holidays from noise standards. The City of Yucaipa also has a vibration standard in Municipal Code Section 87.0910. However, construction is exempt from this requirement if it occurs between 7 a.m. and 7 p.m., except Sundays and Federal holidays.

Temporary Noise

The existing noise levels on the site and the noise levels in the immediate vicinity of the site would increase temporarily during project construction. Short-term construction noise would be generated due to the operation of construction equipment during grading and construction of the detention basin, removal of pavement, trench excavation, grading and the construction of the underground storm drains

[41] City of Calimesa Municipal Code, 8.15.080 B.

and storm water diversion structure. Noise would also be generated by construction workers commuting to and from the site and the delivery of materials and supplies to the site.

Construction noise represents a short-term impact on the ambient noise levels both on the site and the adjacent surrounding communities. Noise generated by the equipment that would be used to grade and construction the storm drain improvements include the operation of trucks, graders, bulldozers, concrete mixers and portable generators can reach high levels.

Sensitive Noise Receptors

There are residences adjacent to and west, south and east of the proposed detention basin with the closest residences approximately 50-feet east of the detention basin. Once the detention basin is constructed the top of the basin would be at ground level and similar elevation as the adjacent residential units. The bottom of the detention basin would be approximately 25 feet below grade. When the construction equipment is operating at the lower elevations of the detention basin the noise levels to the residents closest to the detention basin would be less than the noise levels at the ground level because of the shielding of the detention basin slopes. Therefore, the noise sensitive land uses adjacent to the retention basin would experience progressively lower construction noise as construction progresses to the bottom of the detention basin.

The low-flow water diversion structure proposed at Calimesa Creek and County Line Road is within Calimesa Creek and adjacent to and west of 5th Street. The closest noise sensitive land uses at this location are the residences approximately 75-feet to the south.

There are scattered residences along the alignment of the proposed underground storm drain in County Line Road. The residences south of County Line Road are the closest residents to the proposed underground storm drain and approximately 50-feet from the roadway centerline. The residents closest to the storm drain tie-ins have similar setback distances. Because the two activities have similar construction sequences they are analyzed as a single noise event. Figure 9 shows the sensitive noise receptors in proximity to the project.

Construction Noise Impacts

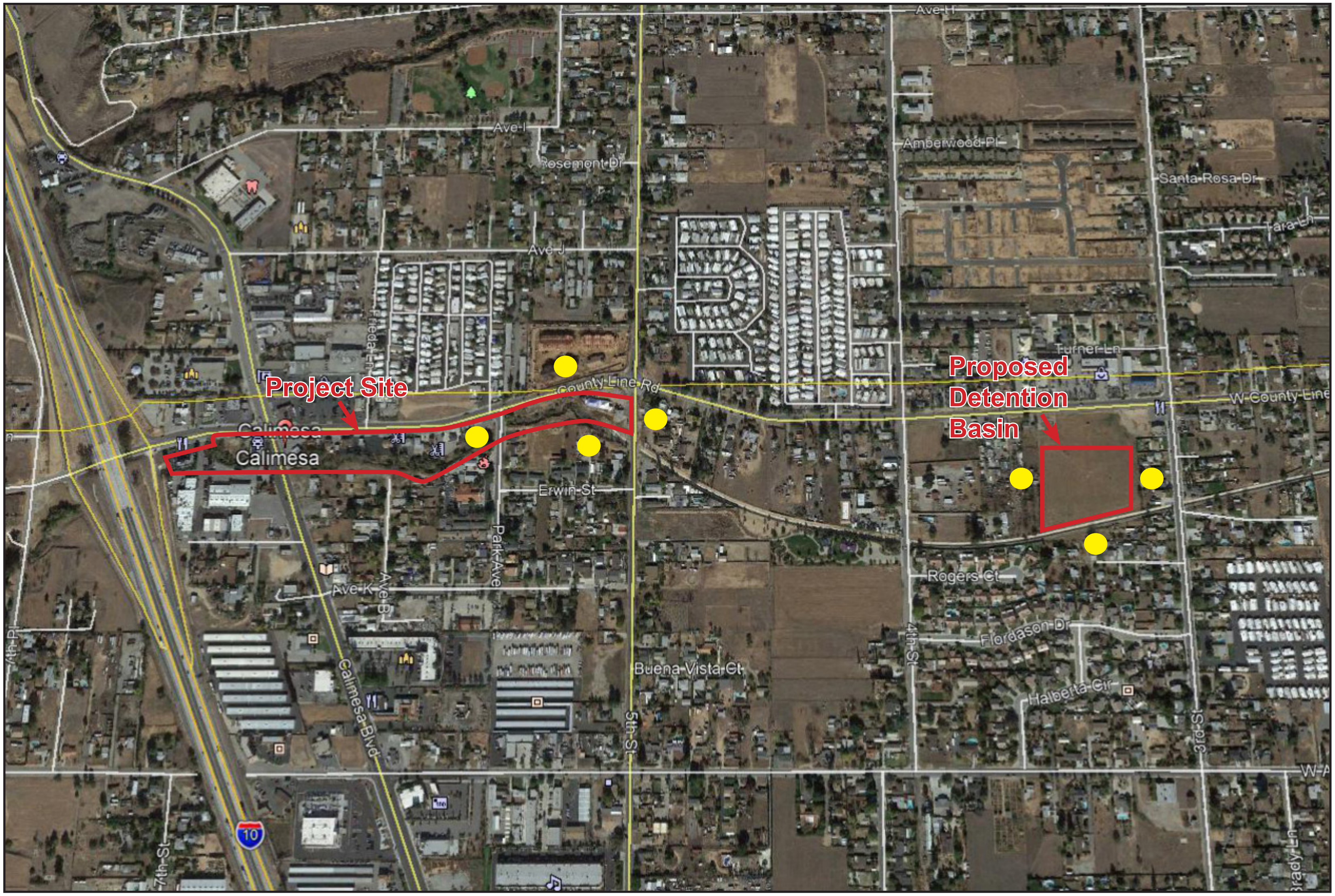
Construction noise levels would vary at any given receptor depending on the construction phase, the type of construction equipment in operation, the duration of use of the construction equipment, the distance the construction equipment is from the noise receptor, and the presence or absence of any barriers between the noise source and receptor that may reduce noise levels.

Noise measurements were taken September 3, 2019 to document the existing ambient baseline noise levels in the project area. No significant changes in land uses have occurred. Noise measurements were taken between 1:00 and 2:30 p.m. at locations representative of both the underground storm drain and detention basin activities. Figure 10 shows the three noise measurement locations. The results of the noise measurements are shown in Table 11.

Table 11
Baseline Noise Levels

Meter	Location	Leq	Lmax	Lmin
1	County Line Road by Holiday Rancho Mobile Home Park	62	74	41
2	NE Corner Proposed Basin Site by County Line Rd	54	68	47
3	NW Corner Proposed Basin Site by County Line Rd	56	79	40

Monitoring experience has shown that 24-hour weighted CNELs are typically 2 to 3 dB higher than mid-day Leq readings (Caltrans Technical Noise Supplement, 2009). This equates to existing CNELs in the 64-65 dBA range at the front of the noise sensitive land uses adjacent to the proposed underground storm drain proposed in County Line Road. The existing CNELs at the single-family detached residences adjacent to the proposed detention basin equates to 56-59 dBA CNEL.
Figure 9 Noise Sensitive Receptors



RESIDENTIAL

Figure 9

Noise Sensitive Receptors

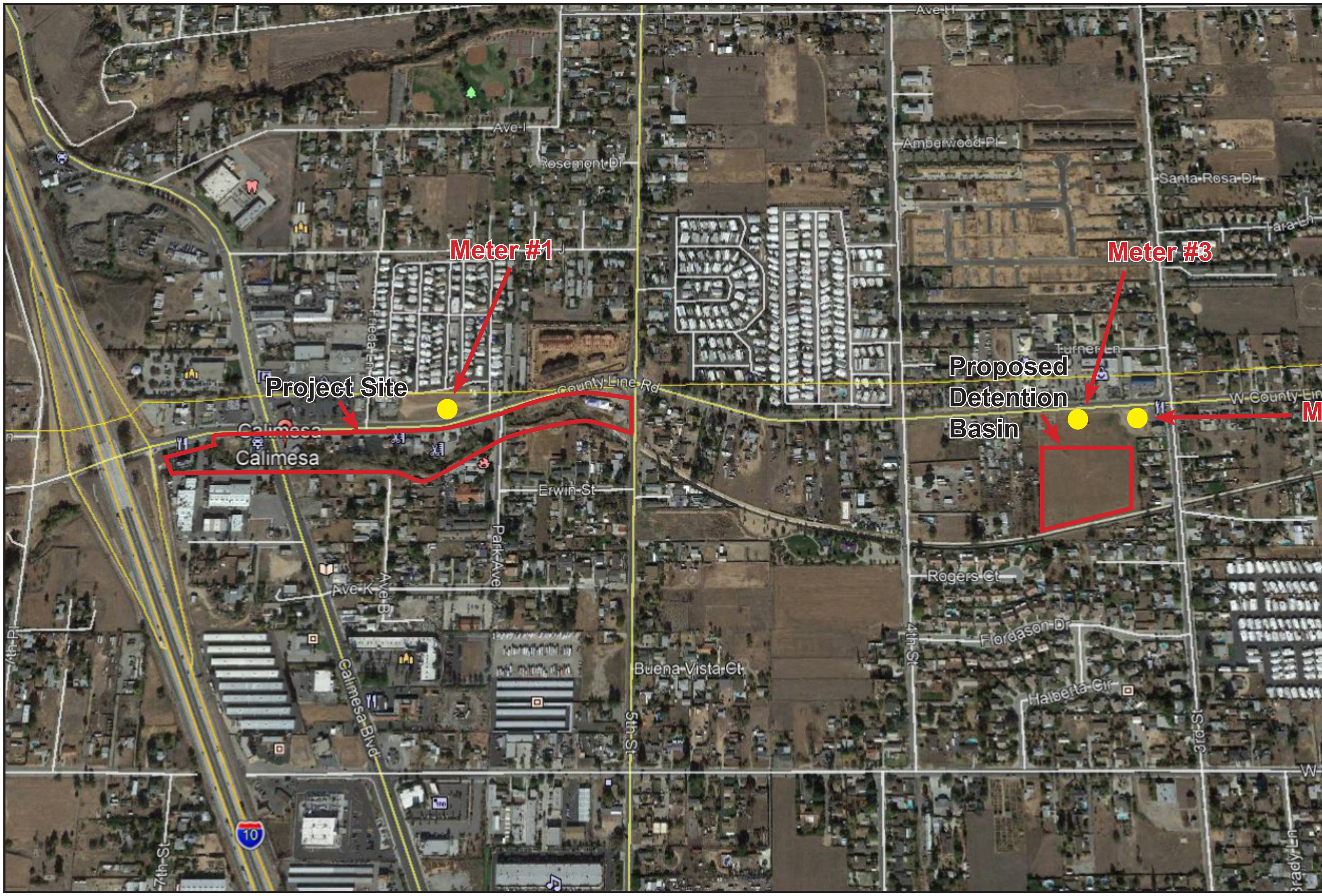


Figure 10

Noise Measurement Locations

The construction noise analysis shows that the residential units closest to construction would experience a temporary/periodic increase above the existing ambient noise levels. Construction noise would be temporary and limited to the hours of construction allowed by Calimesa Municipal Code Section 8.15.080 and Yucaipa Municipal Code Section 87.0905(e). The temporary construction noise impacts would cease upon the completion of construction of the detention basin, diversion structure and the underground storm drain.

In 2006, the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model that includes a national database of construction equipment reference noise emissions levels. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power during a construction phase. The usage factor is a key input variable that is used to calculate the average Leq noise levels.

Table 12 identifies the highest (L_{max}) noise levels associated with each type of equipment identified for use during project construction and the percentage of its use (Usage Factor), which is represented as L_{eq}, and then adjusts the noise level for a reference 50-foot distance, which is a distance to the closest sensitive receptors to the construction area.

Table 12
Construction Noise Impact
Reference Noise Levels

Equipment	Usage Factor	Reference Noise Level 50 ft (dBA)	Average Noise 50 ft (dBA)
Excavators	40%	81	77
Loader	40%	79	75
Backhoe	37%	78	74
Water Truck*	40%	76	72
Scraper	40%	84	80
Dozer	40%	82	78
Concrete Pump	20%	81	74
Concrete Mixer	40%	79	75

*Used noise levels for dump truck as no data for water truck available

Project noise impacts would be significant if they caused a violation of any adopted standards, which for the project is 75 dBA Leq. The calculated construction noise levels for the detention basin are shown in Table 13. As shown, construction equipment at the center of the detention basin with the understanding that some equipment may be farther from the center would not exceed the 75 dBA Leq noise standard even if 2-3 pieces of equipment were operating simultaneously. In addition, there would be a 3 to 3.5-foot masonry wall along the project perimeter that would attenuate construction noise. As construction of the detention basin progresses the construction equipment would be below ground level. The equipment operational height in conjunction with the 3 to 3.5-foot masonry wall along the detention basin boundary would provide an effective 28-foot height differential at the basin bottom. This would provide at minimum 15 dBA noise attenuation (reduction) for the adjacent residences. Therefore, at the start of construction, when the construction equipment would operate directly at the property line the noise levels could be slightly in excess of the 75 dBA Leq goal. However, as construction progresses, the noise attenuation due to the elevation differential would reduce to a noise level of 44-52 dBA Leq to the closest sensitive noise receptor.

Table 13
Construction Noise Impact
Detention Basin (Noise at Closest Receiver)

Equipment	Average Noise at Site Edge (dBA)	Average Noise at Center Site (dBA)*
Excavator	77	49
Dozer	78	50
Scraper	80	52
Loader	75	47
Water Truck	72	44

*Attenuated for distance and below grade elevation

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The low-flow diversion structure is approximately 75 feet from the closest noise sensitive land uses to the site, which are the two single-family residences to the south. The noise levels to these two residences associated with the construction of the low-flow diversion structure would not exceed the 75 dBA Leq goal as shown in Table 14. The multi-family units to the north, north of County Line Road, are approximately 150-feet from the proposed low-flow diversion structure. The noise levels to the residents of the multi-family units north of County Line Road would not experience and be impacted by noise levels greater than 75 dBA.

Table 14
Construction Noise Impact
Diversion Structure (Noise at Closest Receiver)

Equipment	Average Noise Closest Receptor (dBA)
Excavator	74
Concrete Pump	70
Concrete Mixer	71
Loader	71

At the closest residential setback of 50 feet, noise levels along the alignment of the underground storm drain and tie-ins are estimated to range between 72 and 78 dBA (Leq). The noisiest construction activities would occur during pavement excavation. The maximum noise levels are limited to the time it takes to remove the pavement, when necessary, and dig the storm drain trenches. The project engineer estimates the linear progress rate for the underground pipeline is approximately 100 feet per day. The operation of construction equipment in close proximity to a residence would be brief. In these brief periods while the noise levels would be noticeable, the exceedance would be sporadic (not continuous), limited in duration, and only occur when the construction equipment is typically operated within 50 feet of a receptor. At 75 feet the noise levels would be below 75 dBA Leq. Additionally, as shown in Table 8, the Calimesa Noise Code allows for upward adjustment of the noise standard when equipment operates less than 8 hours. Although it is difficult to estimate and speculative, any single piece of heavy equipment would only operate within 50 feet of a residence for a short period of time and would not operate for 8 straight hours. For example, for 2 hours of continuous noise, the construction threshold is adjusted upward by +6 dBA that results in a noise threshold increase to 81 dBA and construction noise by the project would not exceed that standard.

According to the City of Calimesa Municipal Code, permissible hours of construction are between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 10:00 a.m. and 5:00 p.m. on Saturdays or Sundays or holidays. The City of Yucaipa allows construction between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays with no construction on Sundays or holidays. Although the City of Yucaipa does not have any regulations on construction noise levels, compliance with the Calimesa requirements would provide assurance that construction noise levels in both the cities of Calimesa and Yucaipa are not intrusive.

Although no construction noise levels are anticipated or have been identified, the following measure is recommended to minimize construction noise levels to adjacent noise sensitive land uses.

Mitigation Measure No. 15 The following construction noise level reduction measures shall be implemented prior to and throughout project construction:

- All construction equipment shall use properly operating mufflers;
- Stockpiling and staging activities shall be located as far as practicable from dwellings; and
- All mobile equipment shall have properly operated and maintained mufflers.

b) ***Generation of excessive ground borne vibration or ground borne noise levels?*** **Less Than Significant Impact.** Vibration is an oscillatory motion through a solid medium and the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface move away from its original static position. The instantaneous speed that a point on a surface move is described as the velocity and the rate of change of the speed is described as the acceleration. Each of these descriptors can be used to correlate vibration to building damage, and acceptable equipment vibration levels.

During construction, the operation of construction equipment can cause groundborne vibration. This type of vibration is best measured in terms of velocity or acceleration. The peak particle velocity (PPV), or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. The units for PPV velocity are normally inches per second (in/sec). PPV is defined as the maximum instantaneous peak of the vibration signal and is considered appropriate for evaluating potential building damage. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration.

Vibration Impacts

Ground-borne vibration occurs when heavy equipment travels over unpaved surfaces or when it is engaged in soil movement. The effects of ground-borne vibration include discernable movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. Vibration related problems generally occur due to resonances in the structural components of a building because structures amplify groundborne vibration. Within the "soft" sedimentary surfaces of much of Southern California, ground vibration is quickly damped. Groundborne vibration is almost never annoying to people who are outdoors (FTA 2006).

Groundborne vibrations from construction activities rarely reach levels that can damage structures. Because vibration is typically not an issue, very few jurisdictions have adopted vibration significance thresholds. Vibration thresholds have been adopted for major public works construction projects, but these relate mostly to structural protection (cracking foundations or stucco) rather than to human annoyance.

The vibration descriptor commonly used to determine structural damage is the PPV, which is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in in/sec. The range of such vibration is shown in Table 15.

Table 15
Human Response To Transient Vibration

Average Human Response	ppv (in/sec)
Severe	2.000
Strongly perceptible	0.900
Distinctly perceptible	0.240
Barely perceptible	0.035

Source: Caltrans Transportation and Construction Vibration Guidance Manual, 2013.

According to Caltrans, the threshold for structural vibration damage for modern structures is 0.5 in/sec for intermittent sources, which include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment. The American Association of State Highway and Transportation Officials (AASHTO) (1990) identifies maximum vibration levels for preventing damage to structures from intermittent construction or maintenance activities for residential buildings in good repair with gypsum board walls to be 0.4–0.5 in/sec. Below this level there is virtually no risk of building damage. Table 16 shows the predicted vibration levels that are generated by various types of construction equipment.

Table 16
Estimated Vibration Levels During Project Construction

Equipment	PPV at 10 ft (in/sec)	PPV at 15 ft (in/sec)	PPV at 25 ft (in/sec)	PPV at 50 ft (in/sec)
Large bulldozer	0.352	0.191	0.089	0.031
Loaded trucks	0.300	0.152	0.076	0.027
Jackhammer	0.138	0.070	0.035	0.012
Small Bulldozer	0.012	0.006	0.003	0.001

Source: FHWA Transit Noise and Vibration Impact Assessment

As shown in Table 15, the construction equipment that would be operating on the project site near an adjacent residence would not cause damage although the vibration could be in the annoyance range. Regardless, is unlikely that a large bulldozer or loaded truck would ever operate 10 feet from an existing residential structure. Therefore, vibration levels generated by the project would not have any significant cosmetic damage or impacts.

The project would have less than significant ground borne or vibration impacts.

c) ***For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, would the project expose people residing or working in the project area to excessive noise levels?*** **No Impact.** There are no public airports within the immediate project vicinity. The Redlands Municipal Airport that is approximately twelve miles northwest of the project is the closest airport to the project. The project is not located within the land use plan of the Redlands Municipal Airport.[42] Because the project site is approximately twelve miles from the Redlands Municipal Airport and not within the land use plan of the airport, the project would not be impacted by noise levels at Redlands Municipal Airport.

XIV. POPULATION AND HOUSING: Would the project:

a) ***Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example through extension of roads or other infrastructure)? Less Than Significant*** **Impact.** The project does not propose the development of any residential units. Therefore, the project would not induce or increase a growth in the population of either Calimesa. It is speculative at this time to estimate the potential for future development that could directly or indirectly occur and increase population growth in the area due to the construction of the proposed detention basin and storm drain improvements. Any growth that may occur in the immediate area of the project would have to comply with and be consistent with the adopted general plan of the respective jurisdiction. Therefore, any growth that would occur due to that development would be consistent with the planned growth of that jurisdiction. The project would not directly or indirectly result in a substantial unplanned population growth in the project area and significantly impact unplanned population growth.

b) ***Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*** **No Impact.** There are no residential units within the project site that would be displaced by the project. The project would not impact any existing housing.

XV. PUBLIC SERVICES:

a) ***Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:***

i. ***Fire protection?*** **No Impact.** The Riverside County Fire Department provides fire protection services to the City of Calimesa. The fire station that serves the city is located at 906 S. Park Street and is located adjacent to and south of Calimesa Creek. Due to historical flooding in Calimesa Creek, soil erosion and flooding in Calimesa Creek adjacent to the fire station poses safety concerns for the fire station. The proposed storm drain improvements to Calimesa Creek adjacent to the fire station would significantly reduce on-going soil erosion in Calimesa Creek and future flooding at Park Street that impacts the fire station. Therefore, the project would have a positive impact to the Calimesa Fire Station by significantly reducing on-going soil erosion to the banks of Calimesa Creek adjacent to the fire station. The project would also eliminate flooding to Park Street, adjacent to the Calimesa Fire

[42] Redlands Municipal Airport Master Plan, November 18, 2008, Exhibit B,

Station that can impact emergency response times when Park Street and Calimesa Boulevard are flooded. The project would have a positive impact to fire protection services in Calimesa by eliminating soil erosion impacts adjacent to the Calimesa Fire Station and eliminate flooding to Park Street and Calimesa Boulevard that delay fire emergency response times.

ii. ***Police protection?*** **No Impact.** The City of Calimesa Police Department contracts with the Riverside County Sheriff's Department for police protection services. The project could require police protection services such as vandalism and/or theft of construction equipment and materials and traffic congestion during project construction. Once construction is completed the potential demand for these types of police protection services would cease. Eliminating the potential for future flooding at Park Street and Calimesa Boulevard would have a positive impact to police services by improving local access for the police to respond to calls for emergency and reduce or eliminate the need to close city roadways due to flooding. The project would not have any impact to the Calimesa Police Department.

iii. ***Schools?*** **No Impact.** The project does not propose any residential units. Therefore, the project would not generate any students to area schools and would not impact schools.

iv. ***Parks?*** **No Impact.** There are no existing or proposed parks either within or adjacent to the proposed project site that would be impacted by the project. The project would not impact any existing or proposed parks.

v. ***Other public facilities?*** **No Impact.** There are no public facilities or services that would be impacted by the project.

XVI. RECREATION

a) ***Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*** **No Impact.** The project would not impact any existing recreation facilities. Please see Public Services Section "XV.a.iv)" above.

b) ***Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?*** **No Impact.** As discussed in Section "XV.a.iv)" above, the project does not propose to construct or provide any on-site recreational or park facilities. The project would not impact recreational facilities.

XVII. TRANSPORTATION: Would the project:

a) ***Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*** **No Impact..**

The project could export up to approximately 31,000 cubic yards of dirt associated with the excavation of the detention basin and the trenches to install the underground storm drain line. All export material would be hauled to the San Timoteo Landfill that is located approximately 11 miles southwest of the project in the City of Redlands. The proposed truck haul route to haul excavated material from the project site to the landfill is shown in Figure 11.

The transportation of approximately 31,000 cubic yards of dirt from the project site to the San Timoteo Landfill would have no impact to any program plan, policy, ordinance or policy addressing the circulation system, including transit, roadway, bicycle or pedestrian facilities.

Figure 11 Proposed Truck Haul Route

b) **Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? No Impact.** CEQA Guidelines section 15064.3, subdivision (b) addresses project vehicle miles traveled (VMT). Consistent with CEQA Guidelines section 15064.3 a VMT analysis was prepared for the project.[43]

The project proposes to export dirt from the Calimesa Channel detention basin to the San Timoteo Landfill during a two- to three-month construction period. The proposed truck haul route from the project site to the landfill is approximately 11 miles roundtrip. SB 743 identifies VMT as the metric to identify CEQA transportation impacts. To comply with SB 743, the City of Calimesa has defined the conditions for conducting CEQA VMT analysis.[44] The City has identified project types that are local serving by nature as having the presumption of a less than significant traffic or transportation impact. The City uses VMT per service population for its impact threshold.

The project consists of truck trips to haul approximately 31,000 cubic yards of dirt from the detention basin to the San Timoteo Landfill during the construction period. The truck haul route would be active only during the estimated two- to three-month construction period. The approximately 11-mile roundtrip is considered to be local serving trips. A VMT analysis is not applicable to temporary construction traffic, including the project. Therefore, a VMT analysis is not required and the project would have no conflict with CEQA Guidelines section 15064.3.

c) **Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? Less Than Significant Impact.** The project does not propose the construction of any new roadways or intersections. All project traffic would use the local and regional circulation system for access to and from the construction area. Therefore, the project would not increase any hazards to area intersections or roadways.

Local traffic would be delayed and/or rerouted during the construction of the underground storm drain in County Line Road. The project contractor would be required to submit a traffic control plan to the City of Calimesa and the City of Yucaipa prior to the start of construction to show how local traffic would be controlled during construction of the underground storm drain in County Line Road. The project contractor would be required, based on the approved construction traffic control plan, to implement the approved construction traffic plan throughout construction to control and minimize short-term construction traffic impacts. Overall, the project would not have any significant traffic design or circulation hazards or impacts.

d) ***Result in inadequate emergency access?*** **Less Than Significant Impact.** The existing circulation system in the vicinity of the project would continue to provide adequate emergency vehicle access to the project site and the cities of Calimesa and Yucaipa for emergency purposes with the implementation of an approved traffic control plan by the Cities of Calimesa and Yucaipa prior to the start of construction.

[43] Truck Haul Route for Calimesa Channel Stage 3 Detention Basin Vehicles Traveled Assessment, Stantec, February 18, 2022.
[44] City of Calimesa, CA. May 2020. Final City of Calimesa Transportation Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment.

Police, fire, paramedic/ambulance and other emergency vehicles would continue to have adequate access throughout the immediate project area to respond to on- and off-site emergencies. The project would not significantly impact emergency access to the site.

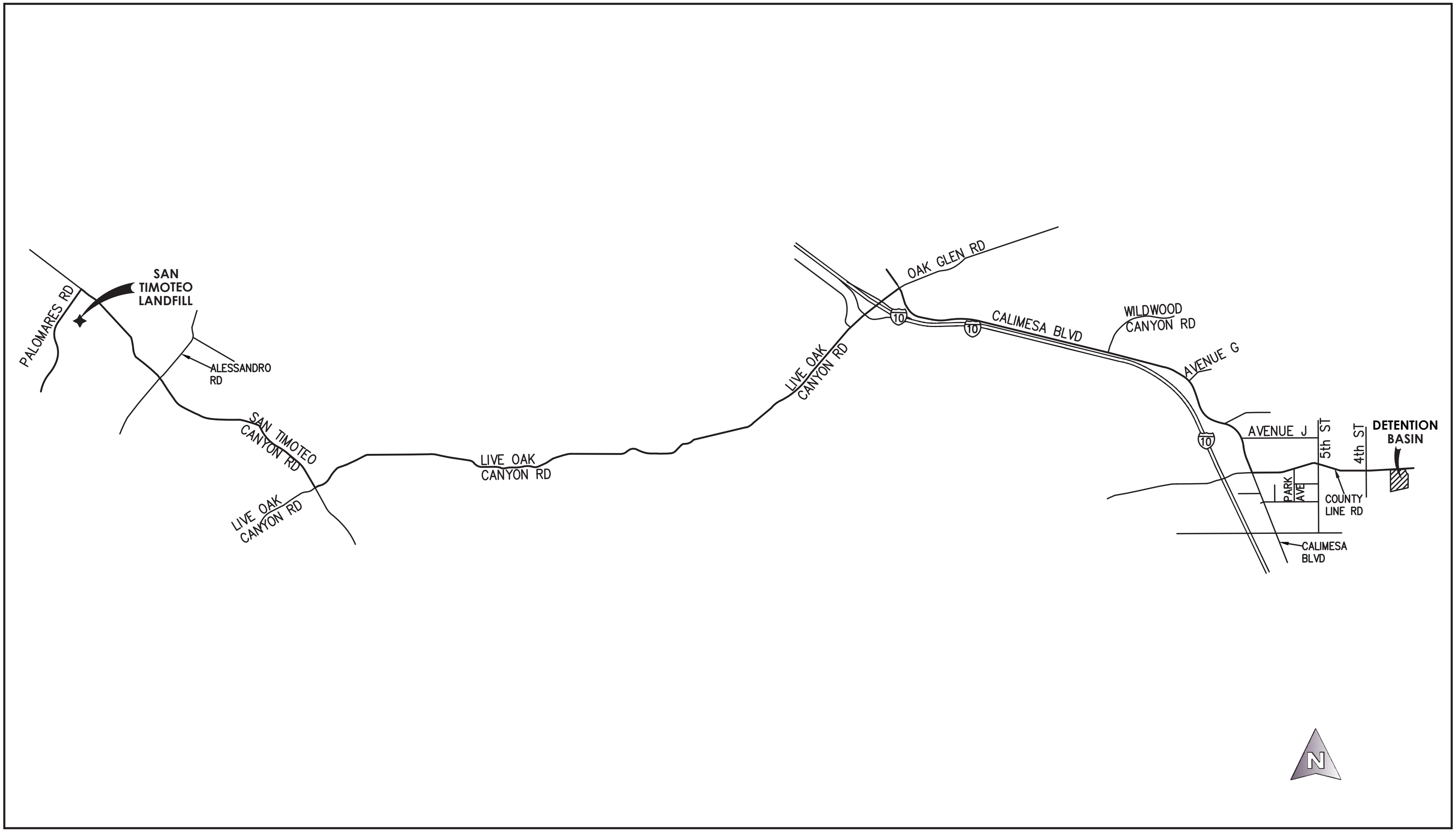

Figure 11
Proposed Truck Haul Route

XVIII. TRIBAL CULTURAL RESOURCES: Would the project:

a) **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1 (k). Potentially Significant Unless Mitigation Incorporated.** As required by AB 52, the City of Calimesa contacted five area Native American Indian Tribes that are on record with the city and may have tribal resources associated with the site. The San Manuel Band of Mission Indians formally invited consultation with the City in compliance with 21080.3.1 of the California Public Resources Code, Division 13, Environmental Quality. The San Manuel Band of Mission Indians identified the potential for tribal cultural resources to be located within the project site and if present, a potential for tribal cultural resources to be impacted during construction. The San Manuel Band of Mission Indians requested tribal monitoring prior to the start of any ground disturbance within the project boundary. As a result, the following cultural and tribal mitigation measures are recommended.

Mitigation Measure No. 16 Due to the heightened cultural sensitivity of the proposed project area, Tribal monitors representing the San Manuel Band of Mission Indians shall be present for all ground disturbing activities that occur within the proposed project area (which includes, but is not limited to, tree/shrub removal and planting, clearing/grubbing, grading, excavation, trenching, compaction, fence/gate removal and installation, drainage and irrigation removal and installation, hardscape installation [benches, signage, boulders, walls, seat walls, fountains, etc.], and archaeological work). A sufficient number of Tribal monitors shall be present each workday to ensure that simultaneously occurring ground disturbing activities receive thorough levels of monitoring coverage. A Monitoring and Treatment Plan that is reflective of the project mitigation (“Cultural Resources” and “Tribal Cultural Resources”) shall be completed by the archaeologist, as detailed within CUL-1, and submitted to the Lead Agency for dissemination to the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI). Once all parties review and agree to the plan, it shall be adopted by the Lead Agency – the plan must be adopted prior to permitting for the project. Any and all findings will be subject to the protocol detailed within the Monitoring and Treatment Plan.

Mitigation Measure No. 17 If a pre-contact cultural resource is discovered during project implementation, ground disturbing activities shall be suspended 60 feet around the resource(s) and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. A research design shall be developed by the archaeologist that shall include a plan to evaluate the resource for significance under CEQA criteria. Representatives from the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI), the archaeologist/applicant, and the Lead Agency shall confer regarding the research design, as well as any testing efforts needed to delineate the resource boundary. Following the completion of evaluation efforts, all parties shall confer regarding the archaeological significance of the resource, its potential as a Tribal Cultural Resource (TCR), and avoidance (or other appropriate treatment) of the discovered resource.

Should any significant resource and/or TCR not be a candidate for avoidance or preservation in place, and the removal of the resource(s) is necessary to mitigate impacts, the research design shall include a comprehensive discussion of sampling strategies, resource processing, analysis, and reporting protocols/obligations. Removal of any cultural resource(s) shall be conducted with the presence of a Tribal monitor representing the Tribe, unless otherwise decided by SMBMI. All plans for analysis shall be reviewed and approved by the applicant and SMBMI prior to implementation, and all removed material shall be temporarily curated on-site. It is the preference of SMBMI that removed cultural material be reburied as close to the original find location as possible. However, should reburial within/near the original find location during project implementation not be feasible, then a reburial location for future reburial shall be decided upon by SMBMI, the landowner, and the Lead Agency, and all finds shall be reburied within this location. Additionally, in this case, reburial shall not occur until all ground-disturbing activities associated with the project have been cataloguing and basic recordation of cultural resources have been completed, and a final monitoring report has been issued to Lead Agency, CHRIS, and SMBMI. All reburials are subject to a reburial agreement that shall be developed between the landowner and SMBMI outlining the determined reburial process/location, and shall include measures and provisions to protect the reburial area from any future impacts (vis a vis project plans, conservation/preservation easements, etc.).

Should it occur that avoidance, preservation in place, and on-site reburial are not an option for treatment, the landowner shall relinquish all ownership and rights to this material and confer with SMBMI to identify an American Association of Museums (AAM)-accredited facility within the County that can accession the materials into their permanent collections and provide for the proper care of these objects in accordance with the 1993 CA Curation Guidelines. A curation agreement with an appropriate qualified repository shall be developed between the landowner and museum that legally and physically transfers the collections and associated records to the facility. This agreement shall stipulate the payment of fees necessary for permanent curation of the collections and associated records and the obligation of the Project developer/applicant to pay for those fees.

All draft records/reports containing the significance and treatment findings and data recovery results shall be prepared by the archaeologist and submitted to the Lead Agency and SMBMI for their review and comment. After approval from all parties, the final reports and site/isolate records are to be submitted to the local CHRIS Information Center, the Lead Agency, and SMBMI.

Mitigation Measure No. 18 In the event that any human remains are discovered within the project area, ground disturbing activities shall be suspended 100 feet around the resource(s) and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. The on-site lead/foreman shall then immediately who shall notify SMBMI, the applicant/developer, and the Lead Agency. The Lead Agency and the applicant/developer shall then immediately contact the County Coroner regarding the discovery. If the Coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the NAHC within twenty-four (24) hours of the determination, as required by California Health and Safety Code § 7050.5 (c). The NAHC-identified Most Likely Descendant (MLD), shall be allowed, under California Public Resources Code § 5097.98 (a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and funerary objects shall be treated and disposed of with appropriate dignity. The MLD, Lead Agency, and landowner agree to discuss in good faith what constitutes "appropriate dignity" as that term is used in the applicable statutes. The MLD shall complete its inspection and make recommendations within forty-eight (48) hours of the site visit, as required by California Public Resources Code § 5097.98. human remains or funerary rites) shall be accomplished in compliance with the California Public Resources Code § 5097.98 (a) and (b). The MLD in consultation with the landowner, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains and funerary objects. All parties are aware that the MLD may wish to rebury the human remains and associated funerary objects on or near the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The applicant/developer/landowner should accommodate on-site reburial in a location mutually agreed upon by the Parties. It is understood by all Parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agencies, will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r).

Reburial of human remains and/or funerary objects (those artifacts associated with any human remains or funerary rites) shall be accomplished in compliance with the California Public Resources Code §

5097.98 (a) and (b). The MLD in consultation with the landowner, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains and funerary objects. All parties are aware that the MLD may wish to rebury the human remains and associated funerary objects on or near the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The applicant/developer/landowner should accommodate on-site reburial in a location mutually agreed upon by the Parties.

It is understood by all Parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agencies, will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r).

With implementation of the recommended mitigation measures would reduce potential tribal cultural resource impacts to less than significant.

b) **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. Potentially Significant Unless Mitigation Incorporated.** As discussed in Section XVII. a) above, the project could have significant impacts to Native American tribal cultural resources. Mitigation Measures No. 16-18 are recommended to reduce potential impacts to Native American tribal cultural resources, if found, to less than significant.

XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:

a) ***Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction of which could cause significant environmental effects?*** **Less Than Significant Impact.** The project proposes to construct a detention basin, diversion structure and underground storm drain. The project does not propose and would not require the construction of any new or the expansion of any other public utilities such as water lines, sewer lines, natural gas or electrical lines. The site for the detention basin is vacant and its construction would not require the expansion of any existing or the construction of any new public utilities other than storm drain facilities to connect with Calimesa Creek adjacent to and south of the basin. The construction of the underground storm drain and diversion structure would not require the expansion of any public utilities or the extension of any existing facilities. Therefore, the project would not have any significant public utility impacts.

b) ***Have sufficient water supplies available to serve the project and reasonable foreseeable future development during normal, dry and multiple dry years?*** **No Impact.** The project would require the consumption of potable water for dust control as required by SCAQMD Fugitive Dust Rule 403 during construction of the detention basin, diversion structure and underground storm drain. The amount of water that would be required to control dust would be minimal and cease once construction is completed. The project would not have an impact on future water supplies.

c) ***Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*** **Less Than Significant Impact.** The construction of the proposed storm drain improvements would indirectly generate minimal quantities of wastewater associated with on-site portable toilets for the construction workers. Once construction is complete the project would not generate any wastewater. The project would not have any wastewater treatment impacts.

d) ***Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? Le*****ss Than Significant Impact.** The project would generate solid waste due to various types of construction debris and waste during the construction of the proposed improvements. Concrete and/or asphalt that is removed from the site can either be ground and reused on the site as base material for the detention basin and/or storm drains, or sold to a recycler. Other types of debris such as rocks, metal, wood, etc. that cannot be recycled would be hauled to the Timoteo Landfill. Due to the small scale of the project the construction debris that would be hauled to the landfill would be minimal and not significantly impact the capacity and life expectancy of the landfill. Once construction is completed, the project would not generate any solid waste. The project will have less than significant solid waste impacts.

e) ***Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*** **No Impact.** The City of Calimesa would require the project contractor to comply with all applicable federal, state, and local statutes and regulations related to solid waste. The project would not have any solid waste impacts because the project would generate a small amount of construction debris and all development in Calimesa is required to comply would all applicable solid waste statues and regulations.

XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

Substantially impair an adopted emergency response plan or emergency evacuation plan? The project will not impact emergency response or evacuation plans. The project site is not within a designated Very High Fire Hazard Severity Zones in Local Responsibility Areas or State and Federal Responsibility Areas.[45] The closest designated Very High Fire Hazard Severity Zones in Local Responsibility Areas are more than a mile from the project site**.** The project site is adjacent to the southern border of the City of Yucaipa. The project site is not within a designated Very High Fire Hazard Severity Zones in Local Responsibility Areas or State and Federal Responsibility Areas of Yucaipa.[46] The closest designated Very High Fire Hazard Severity Zones in Local Responsibility Areas in the City of Yucaipa are generally along the perimeter of the city and approximately two miles from the project site.

The project would not impair or impact any emergency response or emergency evacuation plan associated with an emergency response to a wildfire in the cities of Calimesa and Yucaipa that are designated as Very High Fire Hazard Severity Zones or any other designated local, state or Federal fire hazard zones in the general project area.

[45] https://osfm.fire.ca.gov/media/5908/calimesa.pdf
[46] https://osfm.fire.ca.gov/media/5953/yucaipa.pdf

b) ***Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*** **Less Than Significant Impact.** As discussed in section "XX. a)" above, the project is not in a designated Very High Fire Hazard Severity Zones in Local Responsibility Areas or State and Federal Responsibility Areas. The project site and surrounding properties are generally flat with no significant topographic relief and expose project occupants to wildfire risks. Prevailing winds and Santa Ana winds could expose construction workers to smoke and wildfire pollutants associated with wildfires located locally and regionally, however, that exposure would not be site specific because much of the city and general geographic area would also be exposed to smoke and wildfire pollutants and not the project site specifically. Project construction workers would only be exposed to smoke and wildfire pollutants during the fire season and the time of project construction. Once project construction is completed the exposure by construction workers to smoke and wildfire pollutants would cease. The project would not significantly impact and expose project construction workers to smoke and wildfire pollutants or the uncontrolled spread of a wildfire due to slopes or other factors from a wildfire due to slope, prevailing winds or other factors.

c) ***Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*** **No Impact.** The construction of a detention basin, underground storm drain and diversion structure would not require the installation of any infrastructure, including roads, fuel breaks, emergency water sources, power lines or other utilities that could exacerbate a fire risk. The project would not construct any utilities that would result in temporary or ongoing impacts to the environment.

d) ***Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result or runoff, post-fire slope instability, or drainage changes?*** **No Impact.** As discussed in XX "a" above, the project is not located within a Very High Fire Hazard Zone. As also discussed in section XX "b" above, the project site and surrounding properties are generally flat with no significant topographic relief that would expose structures or project occupants to significant risks due to downslope or uncontrolled spread of a wildfire. Because the project is not located in a fire hazard zone or downstream of any hillsides of areas of topographic relief the project would not expose construction workers to significant risks due to downstream or downstream flooding or landslides due to post-fire slope instabilities.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE:

a) ***Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?*** **Less Than Significant Impact With Mitigation.** The project proposes to construct a detention basin, an underground storm drain and diversion structure to reduce flooding along Calimesa Creek from 3rd Street on the east to Interstate 10 on the west. As identified in the biology report, there are fish and wildlife habitats that would be impacted with the construction of the proposed storm drain improvements. Mitigation Measures No. 1-9 are recommended to reduce potential biological resource impacts to less than significant. The project would impact one intersection associated with trucks hauling export material from the site to the Timoteo Landfill.

The project would not demolish any buildings. Therefore, there are no examples of California history or prehistory on the site or suspected to be found on the site that would be impacted by the project. Mitigation Measures No. 10-11 are recommended to reduce potential cultural resources impacts uncovered during project construction to less than significant. The San Manuel Band of Mission Indians contacted the City of Calimesa and identified the potential for tribal cultural resources to be located within the project site and if present, a potential for tribal cultural resources to be impacted during construction. Mitigation measures No. 15-17 are recommended to reduce potential tribal cultural resources to less than significant.

b) ***Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)*** **No Impact.** Cumulative projects include local development as well as general growth within the project area that, along with the proposed project, could result in cumulative impacts. The Cities of Calimesa and Yucaipa has not identified any individual projects that, along with the proposed project, could have cumulatively considerable impacts. Therefore, the project would not have any cumulatively considerable impacts.

c) ***Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly? Less Than*** **Significant Impact.** There are no significant impacts associated with the project that would cause substantial adverse effects and significantly impact human beings either directly or indirectly that cannot be mitigated to less than significant with the implementation of the recommended mitigation measures.

Appendix A – Air Quality/Greenhouse Gas Report

AIR QUALITY AND GHG IMPACT ANALYSES

CALIMESA CREEK STAGE III PROJECT

CITY OF CALIMESA and YUCAIPA, CALIFORNIA

Prepared by:

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Prepared for:

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Attn: Phil Martin

Date:

February 15, 2022

Project No.: P22-006 AQ

ATMOSPHERIC SETTING

REGIONAL CLIMATE

The climate of the Calimesa area, as with all of Southern California, is governed largely by the strength and location of the semi-permanent high-pressure center over the Pacific Ocean and the moderating effects of the nearby vast oceanic heat reservoir. Local climatic conditions are characterized by very warm summers, mild winters, infrequent rainfall, moderate daytime on-shore breezes, and comfortable humidities. Unfortunately, the same climatic conditions that create such a desirable living climate combine to severely restrict the ability of the local atmosphere to disperse the large volumes of air pollution generated by the population and industry attracted in part by the climate. The City of Calimesa is located within Riverside County near the San Bernardino County line. The project is situated in an area where the pollutants generated in coastal portions of the Los Angeles basin undergo photochemical reactions and then move inland during the daily sea breeze cycle with limited regional meteorological dispersion potential.

Winds across the proposed Calimesa project site are an important meteorological parameter because they control both the initial rate of dilution of locally generated air pollutant emissions as well as controlling their regional trajectory. The wind patterns in this portion of Riverside County display a very unidirectional onshore flow from the west-southwest/west-northwest that is strongest in summer with a weaker offshore return flow from the north-northeast/east-northeast that is strongest on winter nights when the land is colder than the ocean. The onshore winds during the day average 6-10 mph while the offshore flow is often calm or drifts slowly westward at 1-3 mph. During the daytime, any locally generated air emissions are thus rapidly transported eastward toward the Banning Pass/Palm Springs, or upslope within the rising thermal chimneys on the south slopes of the San Bernardino Mountains without generating any localized air quality impacts. The nocturnal drainage winds which move slowly across the area have some potential for localized stagnation, but fortunately, these off-shore winds have their origin in the nearby mountains where background pollution levels are low such that any localized contributions do not create any unhealthful impacts.

In conjunction with the two characteristic wind regimes that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. The summer on-shore flow is capped by a massive dome of warm, sinking air which caps a shallow layer of cooler ocean air. These marine/ subsidence inversions act like a giant lid over the basin. They allow for local mixing of emissions, but they confine the entire polluted air mass within the basin until it escapes into the desert or along the thermal chimneys formed along heated mountain slopes. In winter, when the air near the ground cools while the air aloft remains warm, radiation inversions are formed that trap low-level emissions such as automobile exhaust near their source. As background levels of primary vehicular exhaust rise during the seaward return flow, the combination of rising non-local baseline levels plus emissions trapped locally by these radiation inversions creates micro-scale air pollution "hot spots" near freeways, shopping centers and other traffic concentrations in coastal areas of the Los Angeles Basin. The combination of winds and inversions are critical determinants in leading to the often degraded air quality in summer, and the generally good air quality in winter in the Calimesa area.

AIR QUALITY SETTING

AMBIENT AIR QUALITY STANDARDS (AAQS)

In order to gauge the significance of the air quality impacts of the proposed project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule, which extended and established a new attainment deadline for ozone for the year 2021. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their required attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to “non-attainment” for the 8-hour ozone standard.

Table 1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 $\mu g/m^3$)		0.070 ppm (137 $\mu g/m^3$)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	12.0 $\mu g/m^3$	15 $\mu g/m^3$	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Gas Phase Chemiluminescence	100 ppb (188 $\mu g/m^3$)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)		0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Ultraviolet Fluorescence	75 ppb (196 $\mu g/m^3$)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 $\mu g/m^3$)	
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 $\mu g/m^3$ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 $\mu g/m^3$		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

See footnotes on next page …

For more information please call ARB-PIO at (916) 322-2990

California Air Resources Board (5/4/16)

Table 1 (continued)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA.

8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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Table 2
Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Respirable Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the exposure period for the federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the ARB adopted an annual state standard for nitrogen dioxide (NO_2) that is more stringent than the corresponding federal standard and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5-to-10-micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted. In December 2012, the federal annual standard for PM-2.5 was reduced from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ which matches the California AAQS. The severity of the basin's non-attainment status for PM-2.5 may be increased by this action and thus require accelerated planning for future PM-2.5 attainment.

In response to continuing evidence that ozone exposure at levels just meeting federal clean air standards is demonstrably unhealthful, EPA had proposed a further strengthening of the 8-hour standard. A new 8-hour ozone standard was adopted in 2015 after extensive analysis and public input. The adopted national 8-hour ozone standard is 0.07 ppm which matches the current California standard. It will require three years of ambient data collection, then 2 years of non-attainment findings and planning protocol adoption, then several years of plan development and approval. Final air quality plans for the new standard are likely to be adopted around 2022. Ultimate attainment of the new standard in ozone problem areas such as Southern California might be after 2025.

In 2010 a new federal one-hour primary standard for nitrogen dioxide (NO_2) was adopted. This standard is more stringent than the existing state standard. Based upon air quality monitoring data in the South Coast Air Basin, the California Air Resources Board has requested the EPA to designate the basin as being in attainment for this standard. The federal standard for sulfur dioxide (SO_2) was also recently revised. However, with minimal combustion of coal and mandatory use of low sulfur fuels in California, SO_2 is typically not a problem pollutant.

BASELINE AIR QUALITY

Existing and probable future levels of air quality in the project area can be best inferred from ambient air quality measurements conducted by the South Coast Air Quality Management District (SCAQMD) at its Redlands air monitoring station located less than one mile west of the proposed site. That station, however, only monitors ozone and large particulates. The closest data resource for a more comprehensive spectrum of monitored pollutants is the Central San Bernardino monitoring station. Table 3 summarizes the last four years of published data from the Redlands and Central San Bernardino monitoring stations.

Ozone and particulates are seen to be the two most significant air quality concerns. Ozone is the primary ingredient in photochemical smog. Slightly more than 21 percent of all days exceed the California one-hour standard. The 8-hour state ozone standard has been exceeded an average of 31 percent of all days in the past four years. The federal 8-hour standard is exceeded 23 percent of all days. For the last four years, ozone levels have neither improved nor gotten noticeably worse. While ozone levels are still high, they are much lower than 10 to 20 years ago. Attainment of all clean air standards in the project vicinity is not likely to occur soon, but the severity and frequency of violations is expected to continue to slowly decline during the current decade.

In addition to gaseous air pollution concerns, Riverside experiences frequent violations of standards for 10-micron diameter respirable particulate matter (PM-10). High dust levels occur during Santa Ana wind conditions, as well as from the trapped accumulation of soot, roadway dust and byproducts of atmospheric chemical reactions during warm season days with poor visibility. Table 3 shows that two percent of all days in the last four years experienced a violation of the State PM-10 standard. However, the three-times less stringent federal standard has not been exceeded in the same time period.

A substantial fraction of PM-10 is comprised of ultra-small diameter particulates capable of being inhaled into deep lung tissue (PM-2.5). Peak annual PM-2.5 levels are sometimes almost as high as PM-10, which includes PM-2.5 as a sub-set. Only one day of all measurement days in the last four years experienced a violation of the 24-hour standard of 35 $\mu g/m^3$.

While many of the major ozone precursor emissions (automobiles, solvents, paints, etc.) have been substantially reduced, most major PM-10 sources (construction dust, vehicular turbulence along roadway shoulders, truck exhaust, etc.) have not been as effectively reduced. Prospects of ultimate attainment of ozone standards are better than for particulate matter.

More localized pollutants such as carbon monoxide, nitrogen oxides, etc. are very low near the project site because background levels, never approach allowable levels. There is substantial excess dispersive capacity to accommodate localized vehicular air pollutants such as NOx or CO without any threat of violating applicable AAQS.

Table 3
Air Quality Monitoring Summary (2017-2020)
(Number of Days Standards Were Exceeded, and
Maximum Levels During Such Violations)
(Entries shown as ratios = samples exceeding standard/samples taken)

Pollutant/Standard	**2017**	**2018**	**2019**	**2020**
Ozone				
1-Hour > 0.09 ppm (S)	79	53	73	104
8-Hour > 0.07 ppm (S)	114	94	109	141
8- Hour > 0.075 ppm (F)	60	66	88	127
Max. 1-Hour Conc. (ppm)	0.156	0.136	0.137	0.173
Max. 8-Hour Conc. (ppm)	0.135	0.114	0.117	0.136
Carbon Monoxide				
8- Hour > 9. ppm (S,F)	0	0	0	0
Max 8-hour Conc. (ppm)	2.3	2.5	1.1	1.4
Nitrogen Dioxide				
1-Hour > 0.18 ppm (S)	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.065	0.057	0.059	0.054
Inhalable Particulates (PM-10)				
24-hour > 50 $\mu g/m^3$ (S)	2/59	2/59	0/59	1/40
24-hour > 150 $\mu g/m^3$ (F)	0/59	0/59	0/59	0/40
Max. 24-Hr. Conc. ($\mu g/m^3$)	77.	74.	44.	57.
Ultra-Fine Particulates (PM-2.5)				
24-Hour > 35 $\mu g/m^3$ (F)	1/116	0/114	0/97	0/115
Max. 24-Hr. Conc. ($\mu g/m^3$)	38.2	30.1	34.8	25.7

Source: South Coast AQMD Air Monitoring Station Data Summary
Redland Monitoring Station: Ozone, PM-10
San Bernardino 4th Street Monitoring Station: CO, NOx, PM-2.5

AIR QUALITY PLANNING

The Federal Clean Air Act (1977 Amendments) required that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards. The SCAB could not meet the deadlines for ozone, nitrogen dioxide, carbon monoxide, or PM-10. In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and revised it several times as earlier attainment forecasts were shown to be overly optimistic.

The 1990 Federal Clean Air Act Amendment (CAAA) required that all states with air-sheds with "serious" or worse ozone problems submit a revision to the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised and approved over the past decade. The most current regional attainment emissions forecast for ozone precursors (ROG and NOx) and for carbon monoxide (CO) and for particulate matter are shown in Table 4. Substantial reductions in emissions of ROG, NOx and CO are forecast to continue throughout the next several decades. Unless new particulate control programs are implemented, PM-10 and PM-2.5 are forecast to slightly increase.

The Air Quality Management District (AQMD) adopted an updated clean air "blueprint" in August 2003. The 2003 Air Quality Management Plan (AQMP) was approved by the EPA in 2004. The AQMP outlined the air pollution measures needed to meet federal health-based standards for ozone by 2010 and for particulates (PM-10) by 2006. The 2003 AQMP was based upon the federal one-hour ozone standard which was revoked late in 2005 and replaced by an 8-hour federal standard. Because of the revocation of the hourly standard, a new air quality planning cycle was initiated.

With re-designation of the air basin as non-attainment for the 8-hour ozone standard, a new attainment plan was developed. This plan shifted most of the one-hour ozone standard attainment strategies to the 8-hour standard. As previously noted, the attainment date was to "slip" from 2010 to 2021. The updated attainment plan also includes strategies for ultimately meeting the federal PM-2.5 standard.

Because projected attainment by 2021 required control technologies that did not exist yet, the SCAQMD requested a voluntary "bump-up" from a "severe non-attainment" area to an "extreme non-attainment" designation for ozone. The extreme designation was to allow a longer time period for these technologies to develop. If attainment cannot be demonstrated within the specified deadline without relying on "black-box" measures, EPA would have been required to impose sanctions on the region had the bump-up request not been approved. In April 2010, the EPA approved the change in the non-attainment designation from "severe-17" to "extreme." This reclassification set a later attainment deadline (2024), but also required the air basin to adopt even more stringent emissions controls.

Table 4
South Coast Air Basin Emissions Forecasts (Emissions in tons/day)

Pollutant	2015[a]	2020[b]	2025[b]	2030[b]
NOx	357	289	266	257
VOC	400	393	393	391
PM-10	161	165	170	172
PM-2.5	67	68	70	71

[a]2015 Base Year.
[b]With current emissions reduction programs and adopted growth forecasts.
Source: California Air Resources Board, 2013 Almanac of Air Quality

In other air quality attainment plan reviews, EPA had disapproved part of the SCAB PM-2.5 attainment plan included in the AQMP. EPA stated that the current attainment plan relied on PM-2.5 control regulations that had not yet been approved or implemented. It was expected that a number of rules that were pending approval would remove the identified deficiencies. If these issues were not resolved within the next several years, federal funding sanctions for transportation projects could result. The 2012 AQMP included in the current California State Implementation Plan (SIP) was expected to remedy identified PM-2.5 planning deficiencies.

The federal Clean Air Act requires that non-attainment air basins have EPA approved attainment plans in place. This requirement includes the federal one-hour ozone standard even though that standard was revoked almost ten years ago. There was no approved attainment plan for the one-hour federal standard at the time of revocation. Through a legal quirk, the SCAQMD is now required to develop an AQMP for the long since revoked one-hour federal ozone standard. Because the current SIP for the basin contains a number of control measures for the 8-hour ozone standard that are equally effective for one-hour levels, the 2012 AQMP was believed to satisfy hourly attainment planning requirements.

AQMPs are required to be updated every three years. The 2012 AQMP was adopted in early 2013. An updated AQMP was required for completion in 2016. The 2016 AQMP was adopted by the SCAQMD Board in March, 2017, and has been submitted the California Air Resources Board for forwarding to the EPA. The 2016 AQMP acknowledges that motor vehicle emissions have been effectively controlled and that reductions in NOx, the continuing ozone problem pollutant, may need to come from major stationary sources (power plants, refineries, landfill flares, etc.) The current attainment deadlines for all federal non-attainment pollutants are now as follows:

8-hour ozone (70 ppb)	2032
Annual PM-2.5 (12 $\mu g/m^3$)	2025
8-hour ozone (75 ppb)	2024 (old standard)
1-hour ozone (120 ppb)	2023 (rescinded standard)

24-hour PM-2.5 (35 μg/m^3) 2019

The key challenge is that NOx emission levels, as a critical ozone precursor pollutant, are forecast to continue to exceed the levels that would allow the above deadlines to be met. Unless additional stringent NOx control measures are adopted and implemented, ozone attainment goals may not be met.

The proposed project does not directly relate to the AQMP in that there are no specific air quality programs or regulations governing storm water improvement projects. Conformity with adopted plans, forecasts and programs relative to population, housing, employment and land use is the primary yardstick by which impact significance of planned growth is determined. The SCAQMD, however, while acknowledging that the AQMP is a growth-accommodating document, does not favor designating regional impacts as less-than-significant just because the proposed development is consistent with regional growth projections. Air quality impact significance for the proposed project has therefore been analyzed on a project-specific basis.

AIR QUALITY IMPACT

STANDARDS OF SIGNIFICANCE

Air quality impacts are considered "significant" if they cause clean air standards to be violated where they are currently met, or if they "substantially" contribute to an existing violation of standards. Any substantial emissions of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, would also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following four tests of air quality impact significance. A project would have a potentially significant impact if it would:

a) Conflicts with or obstructs implementation of the applicable air quality plan.

b) Results in a cumulatively considerable net increase of any criteria pollutants for which the Project region is non-attainment under an applicable federal or state ambient air quality standard.

c) Exposes sensitive receptors to substantial pollutant concentrations.

d) Creates objectionable odors affecting a substantial number of people.

Primary Pollutants

Air quality impacts generally occur on two scales of motion. Near an individual source of emissions or a collection of sources such as a crowded intersection or parking lot, levels of those pollutants that are emitted in their already unhealthful form will be highest. Carbon monoxide (CO) is an example of such a pollutant. Primary pollutant impacts can generally be evaluated directly in comparison to appropriate clean air standards. Violations of these standards where they are currently met, or a measurable worsening of an existing or future violation, would be considered a significant impact. Many particulates, especially fugitive dust emissions, are also primary pollutants. Because of the non-attainment status of the South Coast Air Basin (SCAB) for PM-10, an aggressive dust control program is required to control fugitive dust during project construction.

Secondary Pollutants

Many pollutants, however, require time to transform from a more benign form to a more unhealthful contaminant. Their impact occurs regionally far from the source. Their incremental regional impact is minute on an individual basis and cannot be quantified except through complex photochemical computer models. Analysis of significance of such emissions is based upon a specified amount of emissions (pounds, tons, etc.) even though there is no way to translate those emissions directly into a corresponding ambient air quality impact.

Because of the chemical complexity of primary versus secondary pollutants, the SCAQMD has designated significant emissions levels as surrogates for evaluating regional air quality impact significance independent of chemical transformation processes. Projects with daily emissions that exceed any of the following emission thresholds are recommended by the SCAQMD to be considered significant under CEQA guidelines.

Table 5
Daily Emissions Thresholds

Pollutant	Construction	Operations
ROG	75	55
NOx	100	55
CO	550	550
PM-10	150	150
PM-2.5	55	55
SOx	150	150
Lead	3	3

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

SENSITIVE RECEPTORS

There are residences surrounding the proposed detention basin site County Line Road near 3rd Street. The closest homes are immediately adjacent to the eastern site perimeter and take access from 3rd Street. The existing land uses adjacent to the proposed storm drain improvements from include vacant land and single-family detached residential units to the south and multi-family to the north in the City of Yucaipa. The closest residence is approximately 50 feet from the roadway centerline.

CONSTRUCTION ACTIVITY IMPACTS

CalEEMod was developed by the SCAQMD to provide a model by which to calculate both construction emissions and operational emissions from a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or annual greenhouse gas (GHG) emissions.

The project entails construction of a 53 acre-foot detention basin at County Line Road near 3rd Street. Additionally, a storm drain system will run from between 5th Street and I-10. Tie-Ins will connect the new storm drain lines to the creek. A low-flow water diversion structure is proposed within Calimesa Creek. This concrete structure would allow low flow water in Calimesa Creek to be diverted west into the Calimesa Creek to maintain existing low water flows in the creek.

Estimated construction emissions were modeled using CalEEMod2020.4.0 to identify maximum daily emissions for each pollutant during project construction. The construction schedule and equipment list was provided by the project engineer and is shown in Table 6.

Table 6
Construction Activity Equipment Fleet

Detention Basin 120 days Export 31,000 CY earthworks	1 Excavator 1 Dozer 1 Scraper 1 Loader 1 Water Truck
Storm Drain Installation 60 days	2 Excavators 1 Loader 1 Backhoe 1 Water Truck
Tie-Ins 30 days	1 Excavator 1 Loader 1 Backhoe
Low-Flow Diversion Structures 60 days	1 Mixer 1 Pump 1 Excavator 1 Loader/Backhoe

CEQA Thresholds

Utilizing the indicated equipment fleet and durations shown in Table 6 the following worst-case daily construction emissions are calculated by CalEEMod and are listed in Table 7.

Table 7
Construction Activity Emissions
Maximum Daily Emissions (pounds/day)

Maximal Construction Emissions	ROG	NOx	CO	SO_2	PM-10	PM-2.5
2022						
Detention Basin	2.4	25.9	18.0	0.1	4.0	2.4
Storm Drain	1.2	10.7	12.3	0.0	0.5	0.4
Tie-Ins	0.5	1.7	5.8	0.0	0.2	0.2
Diversion Structures	0.6	1.7	6.9	0.0	0.3	0.3
Total	**4.7**	**40.0**	**43.0**	**0.1**	**5.0**	**3.3**
SCAQMD Thresholds	75	100	550	150	150	55

Peak daily construction activity emissions are estimated be below SCAQMD CEQA thresholds even if the worst-case days for all activities were to overlap.

Construction equipment exhaust contains carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24-hour per day, 365 days per year, 70-year lifetime exposure. The SCAQMD does not generally require the analysis of construction-related diesel emissions relative to health risk due to the short period for which the majority of diesel exhaust would occur. Health risk analyses are typically assessed over a 9-, 30-, or 70-year timeframe and not over a relatively brief construction period due to the lack of health risk associated with such a brief exposure.

LOCALIZED SIGNIFICANCE THRESHOLDS

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Localized Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005.

Use of an LST analysis for a project is optional. For the proposed project, the only possible LST impact would be during construction. LSTs are applicable for a sensitive receptor where it is possible that an individual could remain for 24 hours such as a residence, hospital or convalescent facility.

LSTs are applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

LST screening tables are available for 25, 50, 100, 200 and 500 meter source-receptor distances. For this project, there are residences adjacent to most project components such that the most conservative and restrictive 25-meter distance was modeled.

LST pollutant screening level concentration data is currently published for 1, 2 and 5 acre sites for varying distances. Because construction of a storm drain is linear, equipment only operates in front of any single residence for a short period of time (progress rate is estimated to be 100 linear feet per day). The most stringent thresholds for a 1 acre site were applied for storm drain activity. However, the detention basin is larger such that thresholds for a 4-acre site were interpolated from available data. One acre-sites were used for other ancillary activities.

The following thresholds and emissions in Table 8 are therefore determined (pounds per day):

Table 8
LST and Project Emissions (pounds/day)

Storm Drain LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	12	11	1	1

Detention Basin LST

LST 4 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	1,677	325	11	7
Max On-Site Emissions	18	26	4	2

Tie-Ins LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	6	2	1	1

Diversion Structures LST

LST 1 acre/25 meters Hemet/San Jacinto Valley	CO	NOx	PM-10	PM-2.5
LST Threshold	750	162	4	3
Max On-Site Emissions	7	2	1	1

LSTs were compared to the maximum daily construction activities. Emissions are below the LST construction thresholds. LST impacts are less-than-significant.

OPERATIONAL IMPACTS

Because a detention basin is a passive structure requiring negligible long-term access, there are no operational air quality impacts associated with the proposed project. There should be a requirement for periodic desilting or vegetation removal, but the frequency and intensity of such actions is purely conjectural. There are no operational emissions associated with the project.

ODORS

The proposed detention pond is designed to not have a significant pool of water remaining after a storm event. Periodic cleaning of both vegetation and trash will ensure no smells arise because of rotting vegetation or other organic material.

CONSTRUCTION EMISSIONS MINIMIZATION

Construction activities are not anticipated to cause dust emissions to exceed SCAQMD CEQA thresholds. Nevertheless, emissions minimization through enhanced dust control measures is recommended for use because of the non-attainment status of the air and proximity of residential uses. Recommended measures include:

Fugitive Dust Control

- Apply soil stabilizers or moisten inactive areas.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically 2-3 times/day).
- Cover all stock piles with tarps at the end of each day or as needed.
- Provide water spray during loading and unloading of earthen materials.
- Minimize in-out traffic from construction zone
- Cover all trucks hauling dirt, sand, or loose material and require all trucks to maintain at least two feet of freeboard
- Sweep streets daily if visible soil material is carried out from the construction site

Similarly, ozone precursor emissions (ROG and NOx) are calculated to be below SCAQMD CEQA thresholds. However, because of the regional non-attainment for photochemical smog, the use of reasonably available control measures for diesel exhaust is recommended. Combustion emissions control options include:

Exhaust Emissions Control

- Utilize well-tuned off-road construction equipment.
- Establish a preference for contractors using Tier 3 or better rated heavy equipment.
- Enforce 5-minute idling limits for both on-road trucks and off-road equipment.

GREENHOUSE GAS EMISSIONS

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Require the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual, to be achieved by 2020.
- Must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Maximum GHG reductions are expected to derive from increased vehicle fuel efficiency, from greater use of renewable energy and from increased structural energy efficiency. Additionally, through the California Climate Action Registry (CCAR now called the Climate Action Reserve), general and industry-specific protocols for assessing and reporting GHG emissions have been developed. GHG sources are categorized into direct sources (i.e. company owned) and indirect sources (i.e. not company owned). Direct sources include combustion emissions from on-and off-road mobile sources, and fugitive emissions. Indirect sources include off-site electricity generation and non-company owned mobile sources.

THRESHOLDS OF SIGNIFICANCE

In response to the requirements of SB97, the State Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The CEQA Appendix G guidelines were modified to include GHG as a required analysis element. A project would have a potentially significant impact if it:

- Generates GHG emissions, directly or indirectly, that may have a significant impact on the environment, or,

- Conflicts with an applicable plan, policy or regulation adopted to reduce GHG emissions.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate." The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

The significance of those emissions then must be evaluated; the selection of a threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The guidelines are clear that they do not support a zero net emissions threshold. If the lead agency does not have sufficient expertise in evaluating GHG impacts, it may rely on thresholds adopted by an agency with greater expertise.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons (MT) CO_2 equivalent/year. In September 2010, the SCAQMD CEQA Significance Thresholds GHG Working Group released revisions which recommended a threshold of 3,000 MT CO_2e for all land use projects. This 3,000 MT/year recommendation has been used as a guideline for this analysis. In the absence of an adopted numerical threshold of significance, project related GHG emissions in excess of the guideline level are presumed to trigger a requirement for enhanced GHG reduction at the project level.

PROJECT RELATED GHG EMISSIONS GENERATION

Construction Activity GHG Emissions

The project is assumed to require less than one year for construction. During project construction, the CalEEMod2020.4.0 computer model predicts that the construction activities will generate the annual CO_2e emissions identified in Table 9.

Table 9
Construction Emissions (Metric Tons CO_2e)

Year 2022	CO_2e
Detention Basin	304.3
Storm Drain	78.6
Tie-Ins	15.6
Diversion Structures	28.9
Total	**427.4**
Amortized	**14.2**

CalEEMod Output provided in appendix

SCAQMD GHG emissions policy from construction activities is to amortize emissions over a 30-year lifetime. The amortized level is provided. GHG impacts from construction are considered less-than-significant.

CONSISTENCY WITH GHG PLANS, PROGRAMS AND POLICIES

The City of Calimesa prepared a Climate Action Plan in September 2014. The purpose was to integrate local planning efforts to reduce GHG emissions and improve the quality of life in the community. The Western Riverside Energy Leader Partnership (WRELP) Program builds upon the existing policies and programs in the region to analyze energy-sector emissions and propose energy conservation and renewable energy measures that reduce GHG emissions within Energy Action Plans for 11 jurisdictions served by SCE. The WRELP partners include Calimesa. The City of Yucaipa has not yet completed a finalized Greenhouse Gas Reduction Plan. The applicable GHG planning document is AB-32.

No recommendations or action items would apply to the proposed storm water project. Except for construction impacts there are no associated operational emissions. Therefore, since the project results in GHG emissions below the SCAQMD 3,000 ton threshold, the project would not conflict with any applicable plan, policy, or regulation to reduce GHG emissions.

CALEEMOD2020.4.0 COMPUTER MODEL OUTPUT

DETENTION BASIN

- DAILY EMISISONS
- ANNUAL EMISSIONS

STORM DRAIN

- DAILY EMISISONS
- ANNUAL EMISSIONS

DIVERTION STRUCTURE

- DAILY EMISISONS
- ANNUAL EMISSIONS

TIE-INS

- DAILY EMISISONS
- ANNUAL EMISSIONS

Appendix B – Biology and Aquatic Resources Delineation Reports

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October 18, 2019 12200

Mr. Steve Ledbetter, P.E.
TKE Engineering Inc.
2305 Chicago Avenue
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Subject: ***Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project, City of Calimesa, Riverside County, California***

Dear Mr. Ledbetter:

This biological resources habitat assessment and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) consistency analysis letter report describes the existing biological conditions of the proposed Calimesa Creek Stage III Project (project) site. The proposed project is analyzed in the context of the California Environmental Quality Act (CEQA) and the MSHCP. This report is intended to describe the existing conditions of the project site and the existing conditions within 500 feet of the project site where access was granted, which is referred to in this report as the study area. This report also describes the general biological reconnaissance survey methods and results, special-status biological resources present or potentially present on site, and potential constraints to development that may be posed by biological resources on the project site. This report also provides an MSHCP consistency assessment including the following requirements of the MSHCP (relevant MSHCP sections are identified in parentheses):

- Riparian/riverine, vernal pool, and fairy shrimp requirements (Section 6.1.2)
- Urban/wildlife interface guidelines (Section 6.1.4)

The proposed project design is in the process of being finalized; therefore, this report does not analyze potential impacts to special-status biological resources in the context of CEQA or the MSHCP. An impacts analysis will be added to this report once the project design has been finalized.

1 Introduction

1.1 Project Location and Description

The 18.5-acre project site is located south of County Line Road, east of Interstate 10 (I-10) and west of 3rd Street, in the City of Calimesa in Riverside County (Figure 1, Project Location; figures can be found in Attachment A, Figures). The project site occurs within U.S. Geological Survey (USGS) 7.5-minute Yucaipa quadrangle map, Sections 11, 12, 13, and 14 of Township 2 South, Range 2 West. The approximate center of the property is at longitude 117°03′19.83″W and latitude 33°00′11.94″N.

The proposed project is considered a continuation of the Calimesa Channel "Stage I" and Stage II" projects completed by the Riverside County Flood Control and Water Conservation District. The proposed project is a component of a storm drain system that will provide 100-year flood protection to existing developments along

County Line Road and would consist of a detention basin and a storm drain system for the Calimesa Channel watershed upstream from the existing storm drain system at I-10 Freeway. The proposed project will provide the following benefits: (1) reduce peak 100-year flow rate to downstream facilities; (2) reduce storm drain infrastructure cost; (3) eliminate flooding at Park Avenue and Calimesa Boulevard; (4) alleviate flooding along the County Line Road and I-10 Freeway underpass; and (5) provide flood protection for the Fire Station, City Hall, and City of Calimesa proposed Downtown Business District.

1.2 Applicable Regulations

This section outlines the federal, state, and local regulations pertinent to the biological resources located in the proposed project area.

1.2.1 Federal

Federal Endangered Species Act

The federal Endangered Species Act (FESA) of 1973 (16 USC 1531 et seq.), as amended, is administered by the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration, and National Marine Fisheries Service. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend, and to provide programs for the conservation of those species, thus preventing extinction of plants and wildlife. Under provisions of FESA Section 9(a)(1)(B), it is unlawful to "take" any listed species. "Take" is defined in FESA Section 3(19) as, "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. In 2017, the Department of Interior Deputy Solicitor's Opinion M-37050 stated that the Migratory Bird Treaty Act applies to "affirmative actions" that have "take" as their purpose. Projects may not "take" migratory birds if the action's intent is to take or kill a migratory bird. Under the Migratory Bird Treaty Act, "take" is defined as pursuing, hunting, shooting, capturing, collecting, or killing, or attempting to do so (16 USC 703 et seq.). Additionally, Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," requires that any project with federal involvement address impacts of federal actions on migratory birds with the purpose of promoting conservation of migratory bird populations (66 FR 3853–3856). Nests are considered "active" if they currently support viable eggs, chicks, or young that are dependent on the nest and have not been abandoned by the parents.

1.2.2 State

California Endangered Species Act

The California Department of Fish and Wildlife (CDFW) administers the California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.), which prohibits the "take" of plant and animal species designated by the Fish and Game Commission as endangered or threatened in the State of California. Under CESA Section 86, "take" is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA Section 2053 stipulates that state agencies may not approve projects that will "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy."

CESA Sections 2080 through 2085 address the taking of threatened, endangered, or candidate species by stating, "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided in this chapter, the Native Plant Protection Act (Fish and Game Code, Sections 1900–1913), or the California Desert Native Plants Act (Food and Agricultural Code, Section 80001)."

Fish and Game Code Section 2081(b) and (c) authorizes take of endangered, threatened, or candidate species if take is incidental to otherwise lawful activity and if specific criteria are met. These provisions also require CDFW to coordinate consultations with USFWS for actions involving federally listed species that are also state-listed species. In certain circumstances, CESA Section 2080.1 allows CDFW to adopt a federal incidental take statement, or a 10(a) permit as its own, based on its findings that the federal permit adequately protects the species and is consistent with state law. A Section 2081(b) permit may not authorize the take of "fully protected" species and "specified birds" (California Fish and Game Code, Sections 3505, 3511, 4700, 5050, 5515, and 5517). If a project is planned in an area where a fully protected species or a specified bird occurs, an applicant must design the project to avoid take.

Fish and Game Code

Pursuant to Fish and Game Code Section 3503.5, it is unlawful to take, possess, or destroy any birds of prey; or to take, possess, or destroy any nest or eggs of such birds. Birds of prey refer to species in the orders Falconiformes and Strigiformes. Nests of all other birds (except English sparrow [house sparrow; *Passer domesticus*] and European starling [*Sturnus vulgaris*]) are protected under Fish and Game Code Sections 3503 and 3513.

According to Fish and Game Code Sections 3511 and 4700, which regulate birds and mammals, respectively, a "fully protected" species may not be taken or possessed without a permit from the Fish and Game Commission, and "incidental takes" of these species are not authorized.

1.2.3 Local

City of Calimesa Municipal Code

Chapter 18.80, Tree Preservation, of the City of Calimesa Municipal Code, sets forth the policy of the City to regulate the cutting, pruning, removal, relocation, or replacement of oak trees unless reasonable and conforming use of the property justifies the removal, cutting, pruning, and/or encroachment into the protected zone of an oak tree, heritage tree, or protected stand of oak trees.

3 Methods

For this biological resources letter report, "special-status" species are those that are (1) listed, proposed for listing, or candidates for listing as threatened or endangered under FESA; (2) listed or candidates for listing as threatened or endangered under CESA; (3) a state fully protected species; (4) a CDFW Species of Special Concern; (5) a species listed on the California Native Plant Society's Inventory of Rare and Endangered Plants with a California Rare Plant Rank of 1B or 2B; or (6) an MSHCP covered species not adequately conserved and species for which the MSHCP has additional surveys requirements for the project site. Special-status vegetation communities are those identified as high priority for inventory in the Natural Communities List (CDFW 2018) by a state rarity ranking of S1, S2, or S3 or identified as a protected resource by the City's Municipal Code.

3.1 Literature Review

Special-status biological resources present or potentially present on the study area were identified through a literature search using the following sources: USFWS's Critical Habitat and Occurrence Data (USFWS 2019a); CDFW's California Natural Diversity Database (CDFW 2019b); the California Native Plant Society's online Inventory of Rare and Endangered Plants (CNPS 2019); the Calflora database, which compiles observation and plant data from both private and public institutions, including the Consortium of California herbaria (Calflora 2019); a Natural Resources Conservation Service soil map (USDA 2019a); the USGS 7.5-minute topographic quadrangle (USGS 2019); U.S. Environmental Protection Agency Watershed Assessment, Tracking & Environmental Results System (EPA 2019), which includes the National Hydrography Dataset; and the National Wetland Inventory (USFWS 2019b). Searches were completed for the following USGSy quadrangles (which include the quadrangle within which the study area is located and the eight surrounding quadrangles): Harrison Mountain, Keller Peak, Big Bear Lake, Redlands, Yucaipa, Forest Falls, Sunnymead, El Casco, and Beaumont.

Additionally, previous reports prepared for the study area were reviewed including the Draft Biological Resources Letter Report (CALIFAUNA 2013) and Biological Field Report/Follow-Up (Froke 2016).

3.2 Field Reconnaissance

Dudek Biologist Britney Strittmater conducted a general biological survey of the study area on September 20, 2019, from 9:45 a.m. to 2:45 p.m. Private properties within the study area were surveyed visually with binoculars from the project site boundary or public roads. The survey was conducted when weather conditions were favorable, with no cloud cover, wind speeds from 1 to 3 miles per hour, and temperatures ranging from 65°F to 79°F. All native and naturalized plant species encountered within the study area were identified and recorded. The potential for special-status plant and wildlife species to occur within the study area was evaluated based on the vegetation communities, soils present, and surrounding features. Vegetation communities and land covers on site were mapped directly in the field onto a 200-foot-scale (1 foot = 200 feet) aerial photograph-based field map of the study area. A formal jurisdictional delineation was conducted on September 20, 2019. The methodology and results are provided under a separate cover; therefore, they are not further discussed within this report.

Latin and common names for plant species with a California Rare Plant Rank follow the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2019). For plant species without a California Rare Plant

Rank, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2019), and common names follow the U.S. Department of Agriculture's Natural Resources Conservation Service Plants Database (USDA 2019b). Natural vegetation communities were mapped in the field using the Vegetation Alliances of Western Riverside County (Klein and Evens 2006). Land cover types (i.e., areas that lack vegetation communities) were described in accordance with Draft Vegetation Communities of San Diego County (Oberbauer et al. 2008). Latin and common names of animals follow Crother (2012) for reptiles and amphibians, the American Ornithologists' Union (AOU 2018) for birds, Wilson and Reeder (2005) for mammals, the North American Butterfly Association (NABA 2016) for butterflies, and Moyle (2002) for fish.

Geographic information system (GIS) analysts digitized the mapped biological resources from field maps to create the baseline biological conditions.

3.3 Survey Limitations

Access was not available within the 500-foot buffer from the project site because some of the properties are private and access was not granted. The 500-buffer was surveyed visually using binoculars. Therefore, vegetation mapping and habitat assessments were conducted from the project site or other public roads, in addition to being complimented with the use of aerial signatures of vegetation communities occurring within the study area.

The reconnaissance survey was conducted during the late summer/early fall season, which resulted in detection and identification of most perennial plant species that may potentially occur in the area. Due to the timing of the surveys, spring and summer annual and cryptic perennials may not have been detectable. Conditions were suitable for detection of most wildlife species (i.e., no cloud cover, 65°F–79°F temperatures, and light winds). However, timing of the survey limited the observations of neotropical breeding birds.

4 Results

4.1 Site Description

The study area is characterized as a mix of residential and commercial development, and vacant lots. The majority of the study area has been developed for over 50 years and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019; NETRonline 2019). Based on aerial imagery (Google Earth 2019), vacant lots have been frequently disced, as recently as December 2018. This is presumed to be for weed abatement and fire prevention. One ephemeral drainage feature (Calimesa Creek) bisects the study area east to west. Elevations range from approximately 2,380 to 2,500 feet above mean sea level. A mix of developed and undeveloped lands (i.e., vacant lots) to the north, south, east, and west surrounds the study area. Representative photographs of the project site are included in Attachment B, Site Photographs.

4.2 Soils

Four soil types are mapped within the study area: Ramona sandy loam (2% to 5% slopes; eroded); Ramona sandy loam (2% to 9% slopes); Ramona very fine sandy loam (0% to 8% slopes; eroded), and San Timoteo (25% to 50% slopes; eroded) (USDA 2019a). The spatial distribution of these soils is depicted in Figure 2, Soils.

- **Ramona Series** consists of well-drained soils formed in alluvium derived mostly from granitic and related rock sources. These soils typically occur on terraces and fans (USDA 2019b). This soil series occurs in the northern, eastern, and southern portions of the study area.
- **San Timoteo Series** consists of moderately deep, well to somewhat excessively drained soils formed in material weathered from shale, sandstone, and calcified weathered granite. These soils typically occur on upland slopes (USDA 2019b). This soil series occurs in the western portion of the study area in between the Ramona Series.

4.3 Vegetation Communities and Land Covers

Two vegetation communities and three non-natural land cover types were documented within the study area: eucalyptus/tree of heaven/black locust groves, Fremont cottonwood, disturbed habitat, non-vegetated channel or floodway, and urban/developed. Figure 3, Biological Resources, illustrates the distribution of vegetation communities and land covers, and Table 1 provides a summary of each vegetation community and land cover's extent within the study area.

Table 1. Vegetation Communities and Land Covers within the Study Area

Vegetation Community/Land Cover	Acreage
Vegetation Communities	
Eucalyptus/Tree of Heaven/Black Locust Groves Semi-Natural Stand	2.38
Fremont Cottonwood Forest Association[1]	0.37
Non-Natural Land Covers	
Disturbed Habitat	21.33
Non-vegetated Channel or Floodway[1]	1.36
Urban/Developed	118.56
Total[2]	**144.02**

Notes:
1 Considered special status by CDFW (CDFW 2018), MSHCP (County of Riverside 2003), or are riparian habitats.
2 Acreage may not total due to rounding.

4.3.1 Eucalyptus/Tree of Heaven/Black Locust Groves Semi-Natural Stands

The eucalyptus/tree of heaven/black locust grove semi-natural stand is dominated by eucalyptus (*Eucalyptus* spp.), tree of heaven (*Ailanthus altissima*), or black locust (*Robinia pseudoacacia*) in the tree canopy, forming an open-to-continuous tree layer less than 60 meters tall with a sparse to intermittent shrub and herbaceous layer (Sawyer et al 2009).

Within the study area, this semi-natural stand occurs along the banks of Calimesa Creek within the western portion of the study area and is co-dominated by tree of heaven and black locust with a few scattered eucalyptus trees present. Scattered giant reed (*Arundo donax*), mulefat (*Baccharis salicifolia*), coast live oak (*Quercus agrifolia*), and Fremont cottonwood (*Populus fremontii*) were present, but did not create a continuous canopy or high enough cover to warrant their own community. This community contained a moderate amount of trash, debris, and litter resulting from homeless encampments and adjacent residential and commercial developments.

The eucalyptus/tree of heaven/black locust grove semi-natural stand does not have a rank in CDFW (2018); therefore, this semi-natural stand is not considered special status under CEQA.

4.3.2 Fremont Cottonwood Forest Association

Fremont cottonwood forest association is dominated or co-dominated by Fremont cottonwood with a continuous to open tree canopy less than 25 meters tall. The shrub layer is intermittent to open, and the herbaceous layer is variable (Sawyer et al. 2009). This community is found rivers, streams, lower canyons, alluvial fans and valleys with a subsurface water supply that various throughout the year (Sawyer et al. 2009).

Fremont cottonwood forest occurs along the downstream banks of Calimesa Creek within the western portion of the study area. This vegetation community contains greater than 5% absolute cover of Fremont cottonwood warranting a community; however, this community does include a high cover of tree of heaven. Scattered emergent coast live oaks and eucalyptus are present at lower covers. The understory is sparse and includes non-native grasses including brome species (*Bromus* spp.).

The Fremont cottonwood forest alliance is ranked by CDFW (2018) as a G3S3 alliance. This ranking indicates that globally and within California the alliance is considered vulnerable and at moderate risk (and is also considered rare and of high priority); therefore, it is considered special status under CEQA. All Fremont cottonwood associations are listed as a high priority for inventory (CDFW 2018) and are considered special status under CEQA.

4.3.3 Disturbed Habitat

The classification of disturbed habitat is due to the predominance of bare ground, non-native plant species, and other disturbance-tolerant plant species. Oberbauer et al. (2008) describes disturbed habitat as areas that have been physically disturbed by previous human activity and are no longer recognizable as a native or naturalized vegetation association, but that continue to retain a soil substrate. Typically, vegetation, if present, is nearly exclusively composed of non-native annual plant species.

Within the study area, disturbed land includes vacant lots that contain a mix of non-native and ruderal species including dove weed (*Croton setiger*), prickly Russian thistle (*Salsola tragus*), and common sunflower (*Helianthus annuus*).

Disturbed habitat is not recognized by CDFW (2018); therefore, this non-natural land cover is not considered special status under CEQA.

4.3.4 Non-Vegetated Floodplain or Channel

Oberbauer et al. (2008) describes non-vegetated floodplain or channel as waterways or flood channels that are unvegetated on a relatively permanent basis that contain sandy, gravelly, or rocky substrates. Vegetation may be present, but is typically less than 10% total cover (Oberbauer et al. 2008).

Within the study area, non-vegetated floodplain or channel encompasses Calimesa Creek. The upstream portion of Calimesa Creek, east of 5th Street, includes a concrete-lined trapezoidal channel. The downstream portion of Calimesa Creek, west of 5th Street, includes a sandy bottom earthen-lined channel that is subject to frequent scouring associated with annual storm events. While the non-vegetated floodplain or channel within the study area was composed primarily of bare ground and a sandy substrate, a low cover of plant species observed in the study area within this land cover type include sacred thorn-apple (*Datura wrightii*), and bromes.

Non-vegetated floodplain or channel is not recognized by CDFW (2018); however, non-vegetated floodplain or channel may be jurisdictional by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act, Regional Water Quality Control Board pursuant to Section 401 of the Clean Water Act or Porter Cologne Act, CDFW pursuant to Section 1602 of the California Fish and Game Code, or considered a special-status resource under the MSHCP. Thus, non-vegetated floodplain or channel may be afforded protection under CEQA.

4.3.5 Urban/Developed

Urban/developed is defined by Oberbauer et al. (2008) as areas that have been constructed on or disturbed so severely that native vegetation is no longer supported. Urban/developed lands includes areas with permanent or semi-permanent structures, pavement or hardscape, landscaped areas, and areas with a large amount of debris or other materials.

Urban/developed land takes the form of residential and commercial development with landscaped ornamentals present, and paved roads.

Urban/Developed is not recognized by CDFW (2018); therefore, this non-natural land cover is not considered special status under CEQA.

4.4 Floral Diversity

A total of 34 species of native or naturalized plants, 13 native (38%) and 21 non-native (62%), were recorded within the study area. This relatively low plant diversity reflects the study area location in an urbanized area and the timing of the site visit, which was conducted in late summer/early fall, which would have precluded the detection of spring and summer blooming annuals. In addition, a majority of the study area was surveyed from public roads, which inherently constrains the ability to inventory all plant species. Plant species observed within the study area are listed in Attachment C, Vascular Plant Species.

4.5 Wildlife

A total of five bird species were detected within the study area, including house finch (*Haemorhous mexicanus*), California scrub-jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), and mourning dove (*Zenaida macroura*). No active bird nests were observed within the study area during the reconnaissance survey; however, the ornamental vegetation and native vegetation (i.e., Fremont cottonwood forest) within the study area provides habitat for nesting birds and raptors. No amphibian species were observed, and no amphibian species are expected to occur. One reptile species was observed during the survey: common side-blotched lizard (*Uta stansburiana*). Three mammal species were detected during the survey: California ground squirrel (*Spermophilus* (*Otospermophilus*) *beecheyi*), desert cottontail (*Sylvilagus audubonii*), and domestic dog (*Canis lupus familiaris*). Wildlife species observed within the study area are listed in Attachment D, Wildlife Species.

4.6 Special-Status Plant Species

Attachment E, Special-Status Plant Species Detected or Potentially Occurring in the Study Area, lists special-status plant species that have been documented in the USGS 7.5-minute Yucaipa quadrangle and the eight surrounding quadrangles (CDFW 2019; CNPS 2019). For each species listed, a determination was made regarding the potential for the species to occur in the study area based on information gathered during the field reconnaissance, including the location of the site, habitats present, current site conditions, and past and present land use. Listed species with a potential to occur and non-listed special-status species with a moderate or higher potential to occur are discussed herein.

Focused special-status plant surveys were not conducted. No federally or state listed special-status plant species were incidentally detected within the study area. One non-listed special-status species, southern California black walnut (*Juglans californica*), which has a California Rare Plant Rank of 1B.1, was observed within the study area along the banks of Calimesa Creek; however, this species is a covered species under the MSHCP (County of Riverside 2003). No federally or state listed or other special-status species have a moderate or high potential to occur within the study area (Attachment E).

4.7 Special-Status Wildlife Species

Attachment F, Special-Status Wildlife Species Detected or Potentially Occurring in the Study Area, lists special-status wildlife species that have been documented in the USGS 7.5-minute Yucaipa quadrangle and the eight surrounding quadrangles (CDFW 2019). For each special-status wildlife species, a determination was made regarding potential use of the study area based on information gathered during the field reconnaissance, known habitat preferences, and knowledge of the species' relative distributions in the area. There are no federally or state listed wildlife species and other special-status wildlife species with a moderate or higher potential to occur in the study area.

Thirteen special-status wildlife species have a low potential to occur within the study area (Attachment F), including the state fully protected white-tailed kite (*Elanus leucurus*). White-tailed kite has a low potential to nest and forage within the study area, and this species is covered under the MSCHP.

4.8 Nesting Birds

The reconnaissance survey was conducted outside of nesting season; however, the study area provides potential nesting habitat for commonly occurring birds such as Anna's hummingbird (*Calypte anna*) or house finch. The study area does contain large trees (e.g., eucalyptus, tree of heaven, black locust, coast live oak) suitable for raptor nesting.

4.9 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping stones for wildlife dispersal. The study area is not within any designated wildlife corridors and/or habitat linkages identified in the South Coast Missing Linkages analysis project (South Coast Wildlands 2008), California Essential Habitat Connectivity project (Spencer et al. 2010), or as recognized by the MSHCP. The study area is isolated from designated wildlife corridors/habitat linkages and other open spaces by substantial developed areas and heavily traversed roadways, including I-10. Waters from Calimesa Creek flow into San Timoteo Creek, but Calimesa Creek is an ephemeral drainage, with a relatively small watershed (890 acres) that is highly developed, so native fish species are not expected to be present or use the creek within the study area for upstream or downstream movement.

On a local level, the study area is dominated by developed areas that support minimal vegetation (particularly native vegetation). Calimesa Creek bisects the study area; however, the natural portions of the creek west of I-10 are primarily limited to the study area. Waters from Calimesa Creek flow downstream from the study area into underground culverts beneath Calimesa Boulevard and then for approximately 500 feet beneath I-10 (Google Earth 2019). Calimesa Creek is within a concrete channel in the eastern portion of the study, and its waters are conveyed through underground culverts approximately 0.5 miles to the east of the study area (Google Earth 2019). The study area may provide local movement for some urban-adapted wildlife species (i.e., coyote, striped skunk, raccoon, opossum), but these species would be expected to be able to use similar urban habitat that is adjacent to the study area.

5 Western Riverside County MSHCP Consistency Analysis

The study area is located in the MSHCP Pass Area Plan and must comply with relevant sections of the MSHCP. The study area is not within an MSHCP Criteria Cell (Figure 4, Western Riverside MSHCP Plan Area); therefore, no Reserve Assembly requirements would apply to the project. The study area is not located within MSCHP Section 6.1.3 Narrow Endemic Species Survey Area or MSHCP Section 6.3.2 Additional Survey Needs and Procedures for Criteria Area Plant Species, Burrowing Owl, Mammals, or Amphibians; therefore, additional survey requirements for these biological resources would not apply to the project and are not further discussed. The project's compliance with the relevant sections of the MSHCP is discussed below.

5.1 MSHCP Section 6.1.2 Riparian/Riverine Resources

The MSHCP defines riparian/riverine areas as "lands which contain habitat dominated by trees, shrubs, persistent emergent, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year." The MSHCP further clarifies those areas "demonstrating characteristics as described above which are artificially created are not included in these definitions" (County of Riverside 2003).

There are approximately 3.31 acres of MSHCP riparian/resources within the study area, specifically 2.94 acres of riverine resources and 0.37 acres of riparian habitat (Figure 5, Western Riverside MSHCP Biological Resources). The study area contains one ephemeral drainage (Calimesa Creek) and associated riparian vegetation (Fremont cottonwood forest). Calimesa Creek conveys water ultimately connecting to Temescal Canyon Wash, which has surface connection ultimately flowing to the Santa Ana River. Because this feature conveys water to downstream resources, Calimesa Creek would be considered riverine resources as defined by the MSHCP. Additionally, the associated Fremont cottonwood forest would be considered a riparian resource as defined by the MSHCP.

5.1.1 Vernal Pools and Fairy Shrimp Habitat

The MSHCP defines vernal pools as the following (County of Riverside 2003):

> [S]easonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records.

Fairy shrimp habitat also includes ephemeral pools and other features such as road ruts or stock ponds.

No vernal pool–indicator plant species were identified within the area, and no vernal pools were observed within the study area. Soils mapped in the region are Ramona sandy loam, Ramona very fine sandy loam, and San Timoteo soils. These series are all considered well to moderately well draining and therefore are not known to retain ponded water. However, based on historic aerial imagery (Google Earth 2019), a topographic low point southwest of the intersection of 3rd Street and County Line Road contained standing water as recently as December 2018. This area is consists of a dirt vacant lot that has been graded and lacks vegetation. This topographic low point has contained standing water over the years with standing water also observed in February 2016 and April 2014 (Google Earth 2019). Therefore, based on the fact that this area does hold water, this area was determined to potentially support habitat for Riverside fairy shrimp (*Streptocephalus woottoni*) (Figure 5, Western Riverside MSHCP Biological Resources).

5.1.2 Riparian Birds

The study area supports a few scattered individuals of mulefat, Fremont cottonwood, and giant reed along the central portion of Calimesa Creek as observed during the September 2019 field visit. These scattered individuals are not considered a riparian resource as defined by the MSHCP as they did not create a continuous canopy or high enough cover to warrant their own community. The study area also supports Fremont cottonwood forest at the downstream portion of Calimesa Creek, and this community is considered a riparian resource as defined by the MSHCP. This riparian vegetation is narrow and small in its extent, lacks understory or closed-canopy features, lacks continuity with higher quality habitat, and is not contiguous; therefore, it is not sufficient to support riparian bird species such as least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), or yellow-billed cuckoo (*Coccyzus americanus*).

5.2 MSHCP Section 6.1.4 Urban/Wildlife Interface Guidelines

According to the MSHCP, the Urban/Wildlands Interface Guidelines are intended to address indirect effects associated with locating development in proximity to the MSHCP Conservation Area (County of Riverside 2003, pp. 6–42). The study area is not within any conserved areas; however, Calimesa Creek flows to San Timoteo Creek, which ultimately flows to the Santa Ana River. Due to the proposed project having connectivity to areas described for conservation, the Urban/Wildlife Interface Guidelines are applicable.

6 Conclusions

The study area includes the following special-status biological resources: southern California black walnut, coast live oak, MSHCP riparian/riverine habitat, and potential fairy shrimp habitat. If these resources are impacted as a result of project implementation, avoidance, minimization, and mitigation measures are recommended for the project to be consistent with the MSHCP and that would result in less-than-significant impacts to biological resources under CEQA.

California black walnut is a covered species under the MSHCP; therefore, compliance with the MSHCP as well as payment of the applicable MSHCP Development Mitigation Fee offsets potential direct and indirect impacts to this species. Coast live oaks are a protected resource under the City of Calimesa Municipal Code; therefore, impacts to this species would require appropriate mitigation to offset potential direct and indirect impacts to this species. Impacts to MSHCP Section 6.1.2 Riparian/Riverine resources would require preparation of a Determination of Biologically Equivalent or Superior Preservation identifying avoidance, minimization, and mitigation measures for impacts to riparian and riverine resources. If the proposed project would result in impacts to potential fairy shrimp habitat, two seasons of fairy shrimp surveys would be required. If the proposed project cannot avoid at least 90% of the long-term conservation value of the habitat, a Determination of Biologically Equivalent or Superior Preservation Report would be required.

The results of the formal jurisdictional delineation are provided under a separate cover; however, the proposed project would result in potential impacts to non-wetland waters of the United States and streambeds under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and CDFW. Therefore, the proposed project is expected to require a permit pursuant to Section 404 of the Clean Water Act from the U.S. Army

Corps of Engineers, a Water Quality Certification pursuant to Section 401 of the Clean Water Act from the Regional Water Quality Control Board, and a Streambed Alteration Agreement from CDFW pursuant to Sections 1600–1616 of the California Fish and Game Code, collectively referred to as waters permits.

If you have any questions regarding this biological resources letter report, please feel free to contact me at bstrittmater@dudek.com or at 760.601.3416.

Sincerely,

Britney Strittmater
Biologist

Att.: Attachment A – Figures
Attachment B – Site Photographs
Attachment C – Vascular Plant Species
Attachment D – Wildlife Species
Attachment E – Special-Status Plant Species Detected or Potentially Occurring in the Study Area
Attachment F – Special-Status Wildlife Species Detected or Potentially Occurring in the Study Area

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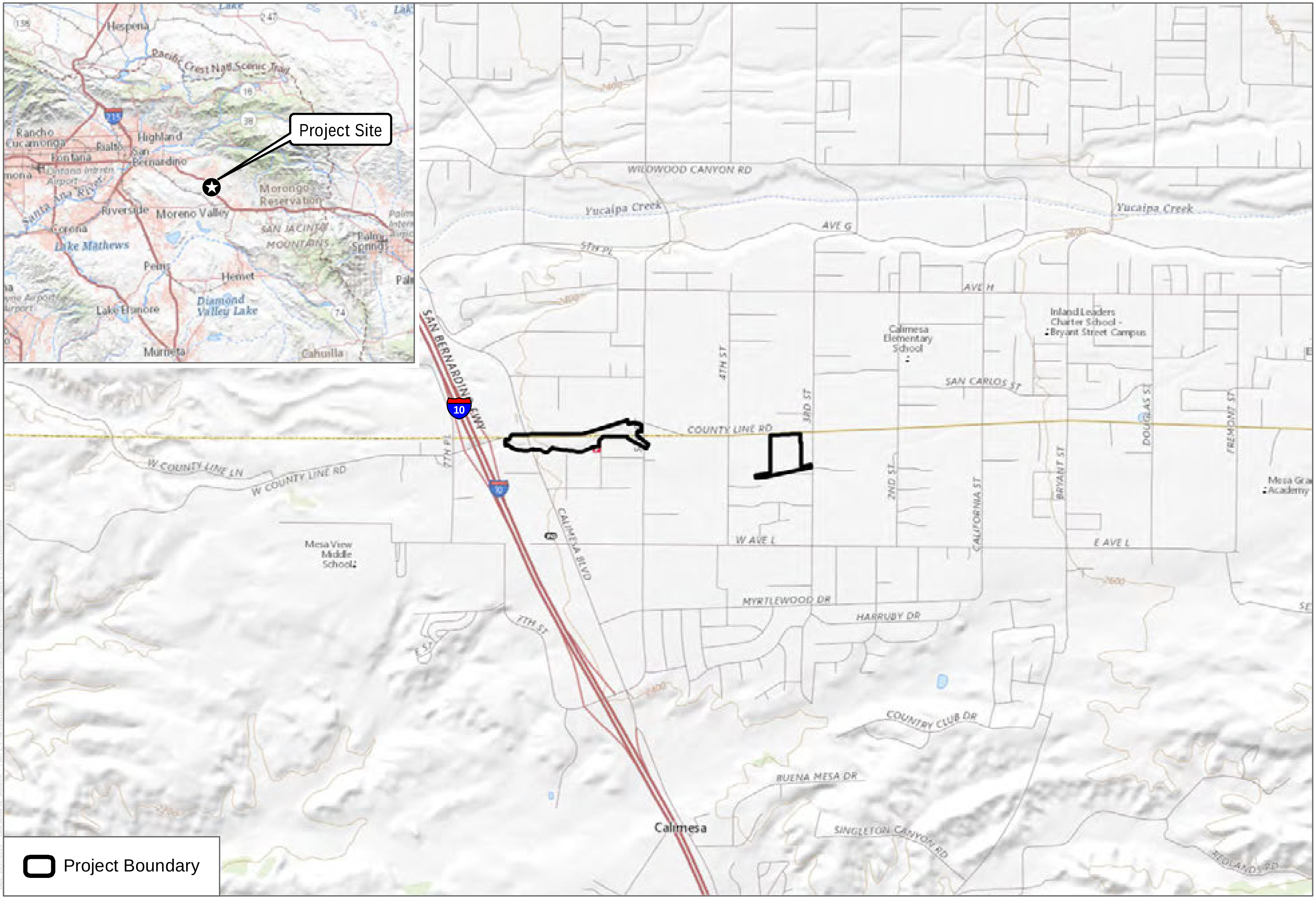
Attachment A

Figures



SOURCE: USGS National Map 2019

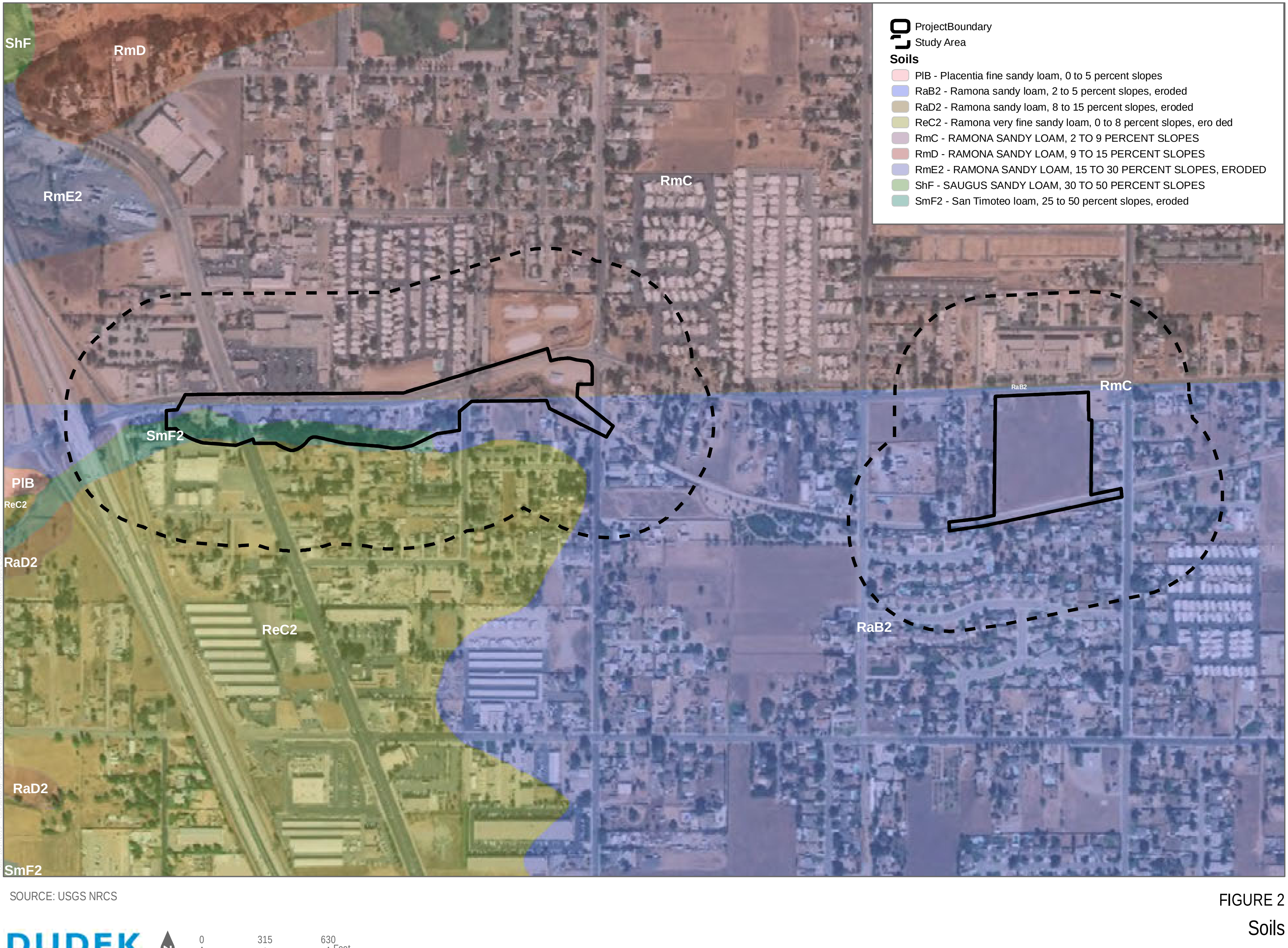
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project



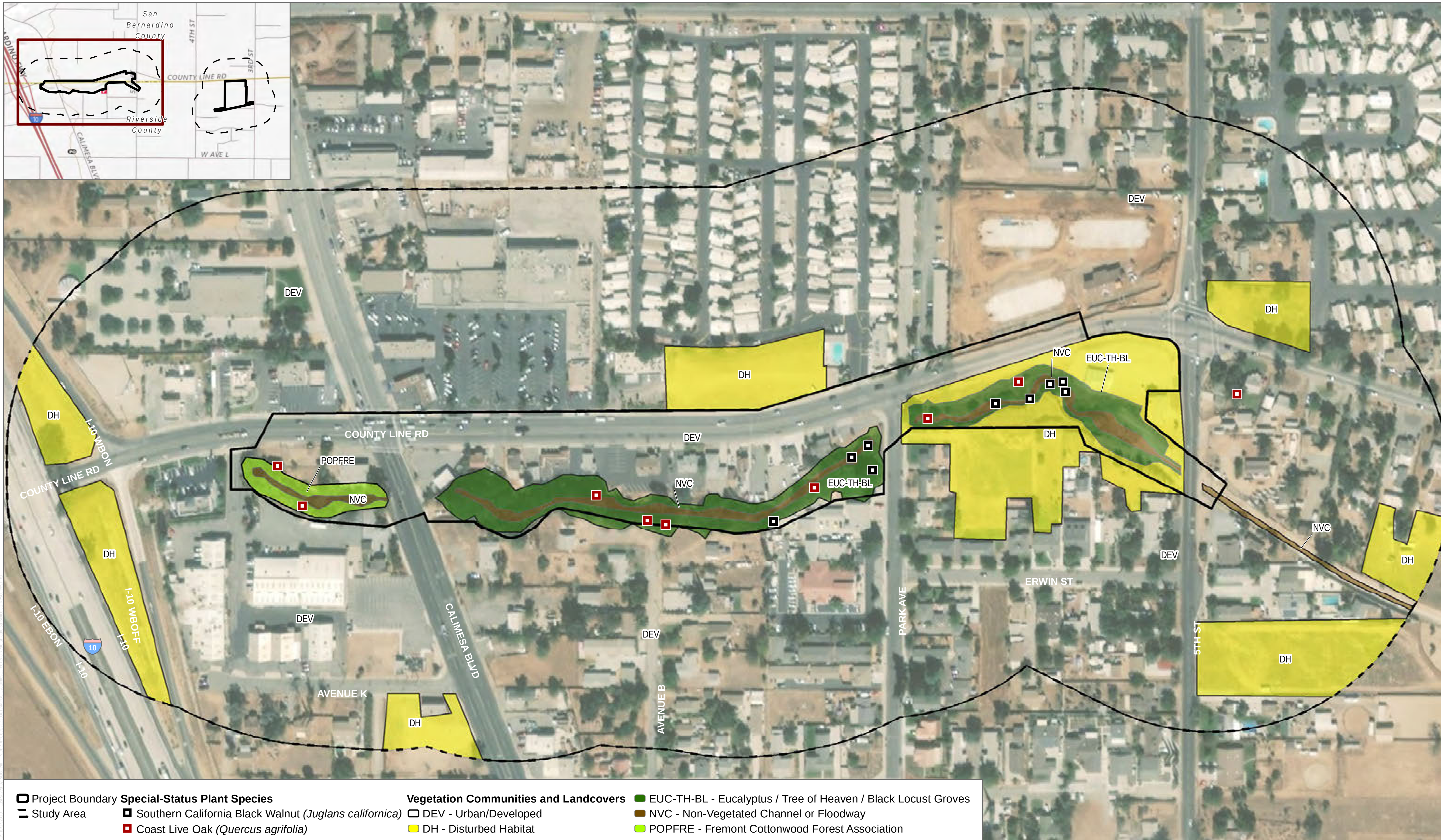
SOURCE: USGS NRCS

DUDEK

FIGURE 2

Soils

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project



SOURCE: DigitalGlobe 2018

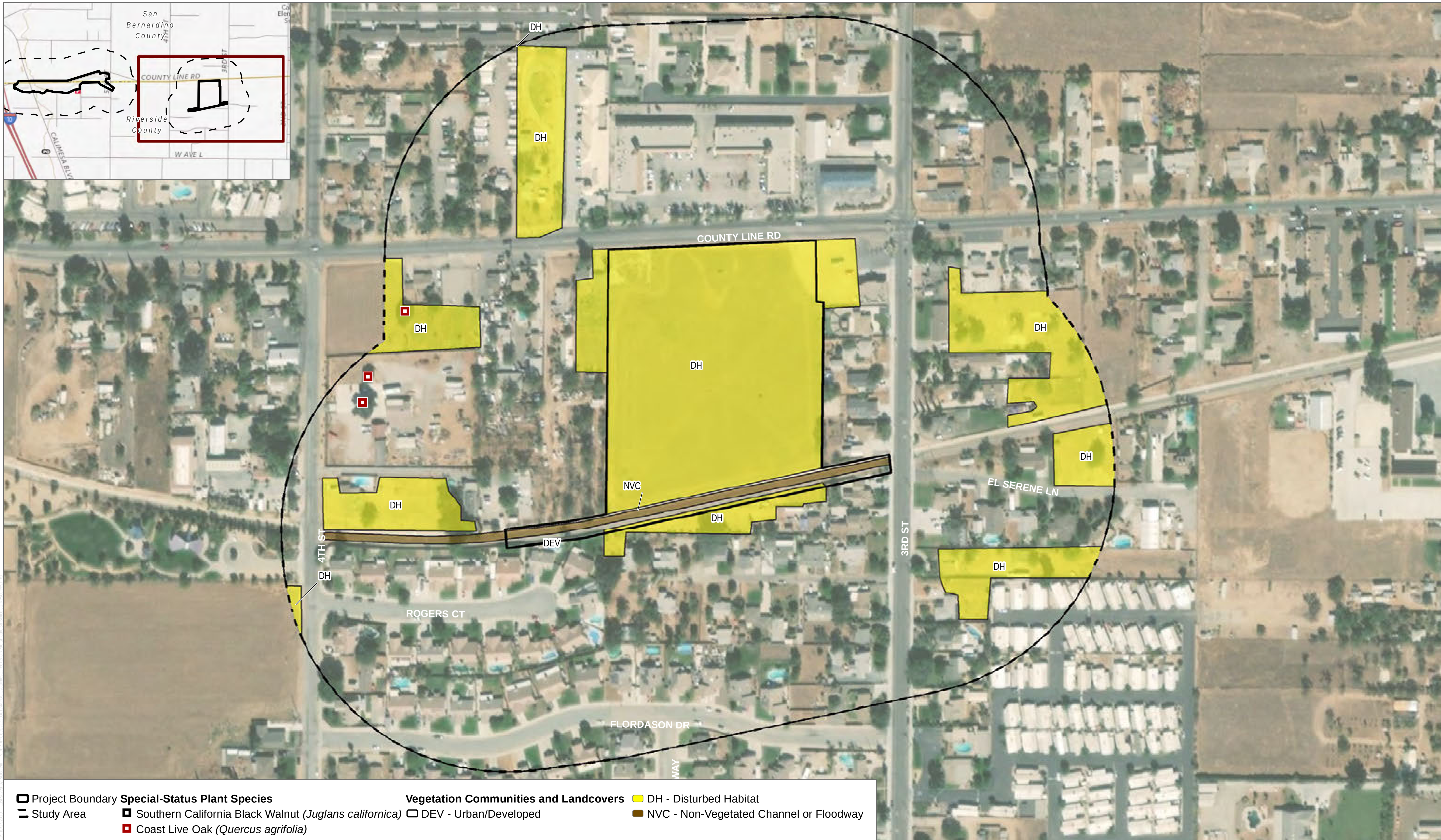
DUDEK

0 100 200 Feet

FIGURE 3A

Biological Resources

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project



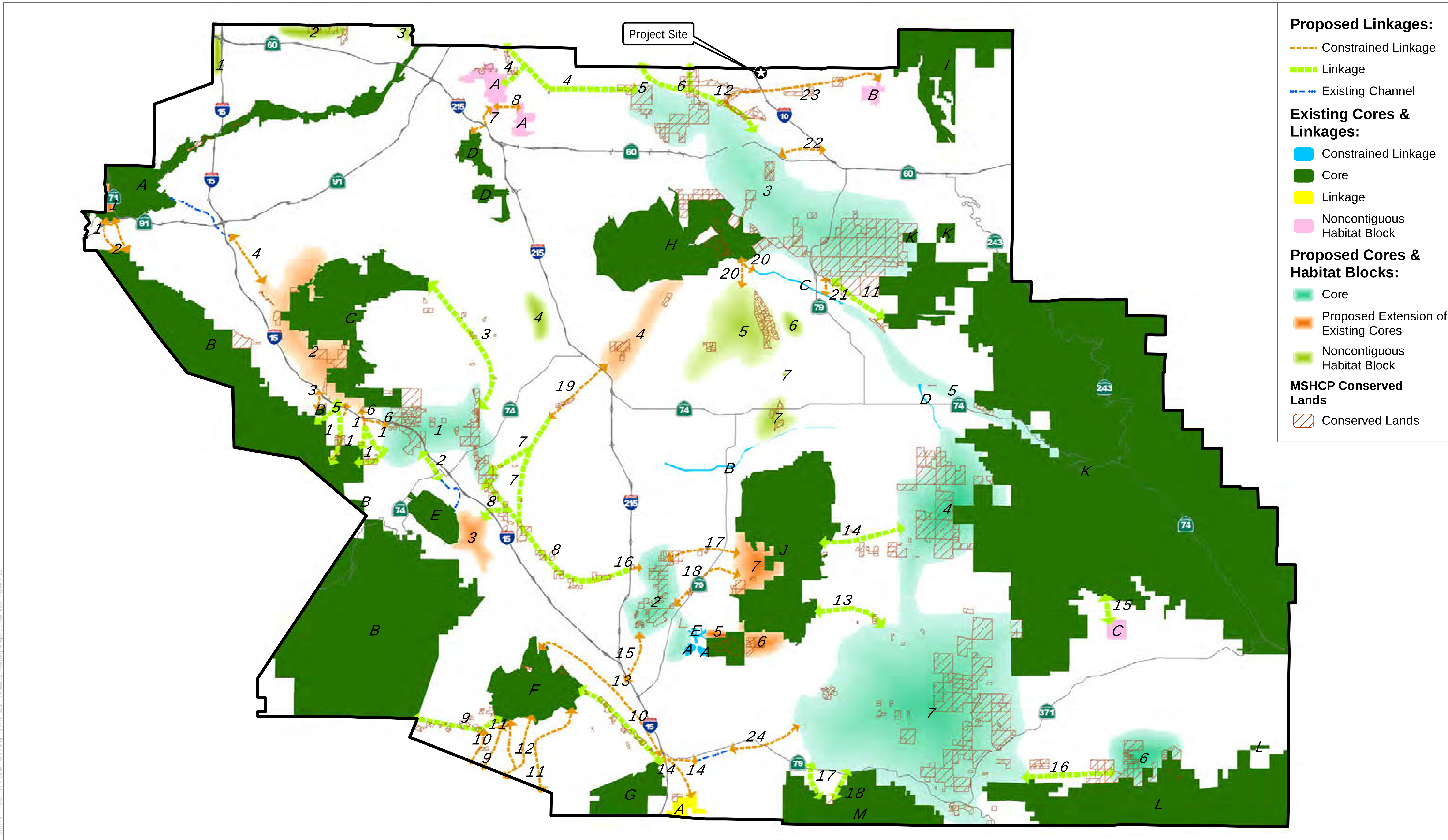
SOURCE: DigitalGlobe 2018

DUDEK 0 100 200 Feet

FIGURE 3B

Biological Resources

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project



SOURCE: Western Riverside County Regional Conservation Authority 2015; County of Riverside 2015

DUDEK

0 12,500 25,000 Feet

FIGURE 4

Western Riverside County MSHCP

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project

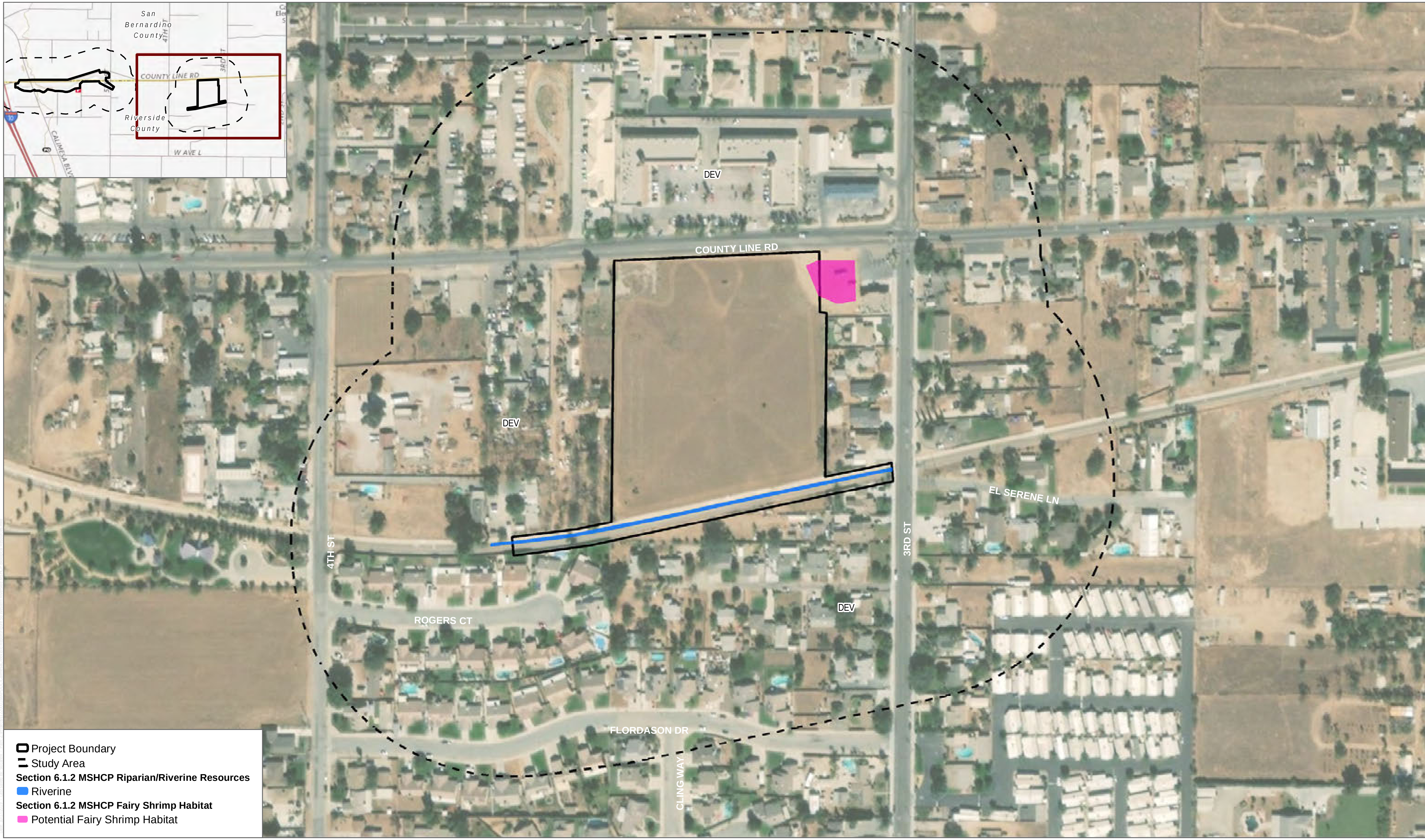
SOURCE: DigitalGlobe 2018

DUDEK

FIGURE 5A

Western Riverside MSHCP Biological Resources

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project



SOURCE: DigitalGlobe 2018

DUDEK

FIGURE 5B

Western Riverside MSHCP Biological Resources

Biological Resources Letter Report and MSHCP Consistency for the Calimesa Creek Stage III Project

Attachment B

Photo Documentation

	
Location 1: View of disturbed habitat and potential fairy shrimp habitat within eastern portion of the project site west of 3rd Street, facing west.	**Location 2:** View of disturbed habitat within the within eastern portion of the project site west of 3rd Street, facing north.
	
Location 3: View of disturbed habitat and California ground squirrel burrows within eastern portion of the project site, facing west.	**Location 4:** View of non-vegetated floodplain or channel within eastern portion of project site west of 3rd Street, facing west.

Location 5: View of non-vegetated floodplain or channel within eastern portion of study area east of 3rd[rd] Street, facing east.

Location 6: View of eucalyptus/tree of heaven/black locust groves within the project site west of 5th Street, facing east.

Location 7: View of non-vegetated floodplain or channel and eucalyptus/tree of heaven/black locust groves west of 5th Street, facing east.

Location 8: View of eucalyptus/tree of heaven/black locust groves within the project site west of Park Avenue, facing east.

	
Location 9: View of eucalyptus/tree of heaven/black locust groves within the project site west of Park Avenue, facing west.	**Location 10:** View of non-vegetated floodplain or channel west of Park Avenue, facing south.
	
Location 11: View of Fremont cottonwood forest within the project site west of Calimesa Boulevard, facing east.	**Location 12**: View of Fremont cottonwood forest within the project site west of Calimesa Boulevard, facing west.

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Attachment C

Vascular Plant Species

EUDICOTS

VASCULAR SPECIES

APOCYNACEAE—DOGBANE FAMILY

* *Nerium oleander*—oleander

ASTERACEAE—SUNFLOWER FAMILY

Ambrosia acanthicarpa—flatspine bur ragweed
Baccharis salicifolia—mulefat
Helianthus annuus—common sunflower
Xanthium strumarium—cocklebur

BRASSICACEAE—MUSTARD FAMILY

* *Hirschfeldia incana*—shortpod mustard

CHENOPODIACEAE—GOOSEFOOT FAMILY

* *Salsola tragus*—prickly Russian thistle

CUCURBITACEAE—GOURD FAMILY

Cucurbita foetidissima—Missouri gourd

EUPHORBIACEAE—SPURGE FAMILY

Croton setiger—dove weed

FABACEAE—LEGUME FAMILY

* *Albizia julibrissin*—silktree
* *Parkinsonia aculeata*—Jerusalem thorn
* *Robinia pseudoacacia*—black locust

FAGACEAE—OAK FAMILY

Quercus agrifolia—coast live oak

JUGLANDACEAE—WALNUT FAMILY

Juglans californica—Southern California black walnut
* *Juglans regia*—English walnut

LAMIACEAE—MINT FAMILY

Trichostema lanceolatum—vinegarweed

MYRTACEAE—MYRTLE FAMILY

* *Eucalyptus globulus*—Tasmanian bluegum
* *Eucalyptus polyanthemos*—redbox

OLEACEAE—OLIVE FAMILY

* *Fraxinus* spp.—ash

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum fasciculatum—California buckwheat

* *Polygonum aviculare*—prostrate knotweed

ROSACEAE—ROSE FAMILY

* *Rubus armeniacus*—Himalayan blackberry

SALICACEAE—WILLOW FAMILY

Populus fremontii ssp. *fremontii*—Fremont cottonwood

SIMAROUBACEAE—QUASSIA OR SIMAROUBA FAMILY

* *Ailanthus altissima*—tree of heaven

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple

ULMACEAE—ELM FAMILY

* *Ulmus parvifolia*—Chinese elm

ZYGOPHYLLACEAE—CALTROP FAMILY

* *Tribulus terrestris*—puncturevine]

MONOCOTS

VASCULAR SPECIES

ARECACEAE—PALM FAMILY

* *Washingtonia robusta*—Washington fan palm

POACEAE—GRASS FAMILY

* *Arundo donax*—giant reed

* *Avena barbata*—slender oat

* *Bromus diandrus*—ripgut brome

* *Bromus madritensis*—compact brome

Distichlis spicata—salt grass

* *Stipa miliacea* var. *miliacea*—smilograss

* signifies introduced (non-native) species

Attachment D

Wildlife Species

BIRD

FINCHES

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus—house finch

JAYS, MAGPIES AND CROWS

CORVIDAE—CROWS AND JAYS

Aphelocoma californica—California scrub-jay

Corvus brachyrhynchos—American crow

MOCKINGBIRDS AND THRASHERS

MIMIDAE—MOCKINGBIRDS AND THRASHERS

Mimus polyglottos—mockingbird

PIGEONS AND DOVES

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

MAMMAL

DOMESTIC

CANIDAE—WOLVES AND FOXES

* *Canis lupus familiaris*—domestic dog

HARES AND RABBITS

LEPORIDAE—HARES AND RABBITS

Sylvilagus audubonii—desert cottontail

SQUIRRELS

SCIURIDAE—SQUIRRELS

Spermophilus (Otospermophilus) beecheyi—California ground squirrel

REPTILE

LIZARDS

PHRYNOSOMATIDAE—IGUANID LIZARDS

Uta stansburiana—common side-blotched lizard

Attachment E

Special-Status Plant Species Detected or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Abronia villosa var. *aurita*	chaparral sand-verbena	None/None/1B.1	None	Chaparral, Coastal scrub, Desert dunes; sandy/annual herb/(Jan)Mar–Sep/245–5,250	Not expected to occur. No suitable vegetation present.
Allium howellii var. *clokeyi*	Mt. Pinos onion	None/None/1B.3	None	Great Basin scrub, Meadows and seeps (edges), Pinyon and juniper woodland/perennial bulbiferous herb/Apr–June/4,265–6,070	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Allium marvinii	Yucaipa onion	None/None/1B.2	Narrow Endemic Plant Species	Chaparral (clay, openings)/perennial bulbiferous herb/Apr–May/2,490–3,495	Not expected to occur. No suitable chaparral or clay soils present.
Arenaria lanuginosa var. *saxosa*	rock sandwort	None/None/2B.3	None	Subalpine coniferous forest, Upper montane coniferous forest; mesic, sandy/perennial herb/July–Aug/4,770–8,530	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Arenaria paludicola	marsh sandwort	FE/SE/1B.1	None	Marshes and swamps (freshwater or brackish); sandy, openings/perennial stoloniferous herb/May–Aug/5–560	Not expected to occur. The study area is located outside of the species' known elevation range and there is no suitable vegetation present. The nearest known occurrence is approximately 10 miles west of the study area (CDFW 2019).
Astragalus lentiginosus var. *coachellae*	Coachella Valley milk-vetch	FE/None/1B.2	None	Desert dunes, Sonoran desert scrub (sandy)/annual/perennial herb/Feb–May/130–2,150	Not expected to occur. The study area is located outside of the species' known elevation range and there is no suitable vegetation present. The nearest known occurrence is approximately 10 miles southeast of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Astragalus lentiginosus var. *sierrae*	Big Bear Valley milk-vetch	None/None/1B.2	None	Mojavean desert scrub, Meadows and seeps, Pinyon and juniper woodland, Upper montane coniferous forest; gravelly or rocky/perennial herb/Apr–Aug/5,905–8,530	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Astragalus leucolobus	Big Bear Valley woollypod	None/None/1B.2	None	Lower montane coniferous forest, Pebble (Pavement) plain, Pinyon and juniper woodland, Upper montane coniferous forest; rocky/perennial herb/May–July/3,605–9,465	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Astragalus pachypus var. *jaegeri*	Jaeger's bush milk-vetch	None/None/1B.1	Covered	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland; sandy or rocky/perennial shrub/Dec–June/1,195–3,200	Not expected to occur. The study area is located within this species' known elevation range; however, there is no suitable vegetation to support this species.
Atriplex coronata var. *notatior*	San Jacinto Valley crownscale	FE/None/1B.1	Criteria Area Survey Plant Species	Playas, Valley and foothill grassland (mesic), Vernal pools; alkaline/annual herb/Apr–Aug/455–1,640	Not expected to occur. The study area is located outside of the species' known elevation range. The nearest known occurrence is approximately 7.5 miles south of the study area (CDFW 2019).
Atriplex serenana var. *davidsonii*	Davidson's saltscale	None/None/1B.2	Criteria Area Survey Plant Species	Coastal bluff scrub, Coastal scrub; alkaline/annual herb/Apr–Oct/30–655	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Berberis nevinii	Nevin's barberry	FE/SE/1B.1	Criteria Area Survey Plant Species	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub; sandy or gravelly/perennial evergreen shrub/(Feb)Mar–June/225–2,705	Low potential to occur. The study area is located within the species' known elevation range, and sandy soils are present; however, this species is known to occur in coarse soils and rocky slopes in chaparral and gravelly wash margins in alluvial scrub (County of Riverside 2003), which are absent. The nearest known occurrence is approximately 7.6 miles west of the study area (CDFW 2019).
Boechera parishii	Parish's rockcress	None/None/1B.2	None	Pebble (Pavement) plain, Pinyon and juniper woodland, Upper montane coniferous forest; rocky, quartzite on clay, or sometimes carbonate/perennial herb/Apr–May/5,805–9,810	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Botrychium crenulatum	scalloped moonwort	None/None/2B.2	None	Bogs and fens, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps (freshwater), Upper montane coniferous forest/perennial rhizomatous herb/June–Sep/4,160–10,760	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Calochortus palmeri var. *palmeri*	Palmer's mariposa lily	None/None/1B.2	None	Chaparral, Lower montane coniferous forest, Meadows and seeps; mesic/perennial bulbiferous herb/Apr–July/2,325–7,840	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Calyptridium pygmaeum	pygmy pussypaws	None/None/1B.2	None	Subalpine coniferous forest, Upper montane coniferous forest; sandy or gravelly/annual herb/June–Aug/6,495–10,205	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Carex occidentalis	western sedge	None/None/2B.3	None	Lower montane coniferous forest, Meadows and seeps/perennial rhizomatous herb/June–Aug/5,395–10,285	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Castilleja cinerea	ash-gray paintbrush	FT/None/1B.2	None	Mojavean desert scrub, Meadows and seeps, Pebble (Pavement) plain, Pinyon and juniper woodland, Upper montane coniferous forest (clay openings)/perennial herb (hemiparasitic)/June–Aug/5,905–9,710	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 14 miles northeast of the study area (CDFW 2019).
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	None/None/1B.2	None	Chaparral, Meadows and seeps, Pebble (Pavement) plain, Riparian woodland, Upper montane coniferous forest; mesic/annual herb (hemiparasitic)/May–Aug/4,265–7,840	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Centromadia pungens ssp. *laevis*	smooth tarplant	None/None/1B.1	Criteria Area Survey Plant Species	Chenopod scrub, Meadows and seeps, Playas, Riparian woodland, Valley and foothill grassland; alkaline/annual herb/Apr–Sep/0–2,100	Not expected to occur. The study area is located outside of the species' known elevation range.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Chloropyron maritimum ssp. *maritimum*	salt marsh bird's-beak	FE/SE/1B.2	None	Coastal dunes, Marshes and swamps (coastal salt)/annual herb (hemiparasitic)/May–Oct(Nov)/0–100	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 10 miles west of the study area (CDFW 2019).
Chorizanthe parryi var. *parryi*	Parry's spineflower	None/None/1B.1	Covered	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland; sandy or rocky, openings/annual herb/Apr–June/900–4,005	Low potential to occur. The study area is located within the species' known elevation range, and sandy soils and terraces are present within Calimesa Creek; however, the study area lacks suitable vegetation to support this species. This species is known to occur within alluvial chaparral and scrub habitats (County of Riverside 2003). The nearest known occurrence is approximately 2.8 miles northeast of the study area (CDFW 2019).
Chorizanthe xanti var. *leucotheca*	white-bracted spineflower	None/None/1B.2	None	Coastal scrub (alluvial fans), Mojavean desert scrub, Pinyon and juniper woodland; sandy or gravelly/annual herb/Apr–June/980–3,935	Not expected to occur. No suitable vegetation present.
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder	None/None/2B.2	None	Marshes and swamps (freshwater)/annual vine (parasitic)/July–Oct/45–920	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Deinandra mohavensis	Mojave tarplant	None/SE/1B.3	Covered	Chaparral, Coastal scrub, Riparian scrub; mesic/annual herb/(May)June–Oct(Jan)/2,095–5,250	Not expected to occur. The study area is located within the species' known elevation range, and mesic conditions are present within Calimesa Creek. However, this species is known to occur within the San Jacinto Mountains. The nearest known occurrence is approximately 11 miles southeast of the study area (CDFW 2019).
Dodecahema leptoceras	slender-horned spineflower	FE/SE/1B.1	Narrow Endemic Plant Species	Chaparral, Cismontane woodland, Coastal scrub (alluvial fan); sandy/annual herb/Apr–June/655–2,495	Not expected to occur. The study area is located within this species' known elevation range, and there are suitable sandy soils present; however, there is no suitable vegetation present to support this species. The nearest known occurrence is approximately 1 mile north of the study area and is possibly extirpated (CDFW 2019).
Drymocallis cuneifolia var. *cuneifolia*	wedgeleaf woodbeauty	None/None/1B.1	None	Riparian scrub, Upper montane coniferous forest; Sometimes carbonate/perennial herb/June–Aug/5,905–7,925	Not expected to occur. The study area is located outside of the species' known elevation range.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Eremogone ursina	Big Bear Valley sandwort	FT/None/1B.2	None	Meadows and seeps, Pebble (Pavement) plain, Pinyon and juniper woodland; mesic, rocky/perennial herb/May–Aug/5,905–9,515	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. This species is endemic to the San Bernardino Mountains, and the nearest known occurrence is approximately 17 miles northeast of the study area (CDFW 2019).
Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woollystar	FE/SE/1B.1	Covered	Chaparral, Coastal scrub (alluvial fan); sandy or gravelly/perennial herb/Apr–Sep/295–2,000	Not expected to occur. The study area is located slightly outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is from 1923 and is approximately 1 mile northeast of the study area (CDFW 2019).
Eriogonum kennedyi var. *alpigenum*	southern alpine buckwheat	None/None/1B.3	None	Alpine boulder and rock field, Subalpine coniferous forest; granitic, gravelly/perennial herb/July–Sep/8,530–11,485	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Eriogonum kennedyi var. *austromontanum*	southern mountain buckwheat	FT/None/1B.2	None	Lower montane coniferous forest (gravelly), Pebble (Pavement) plain/perennial herb/June–Sep/5,805–9,480	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 19 miles northeast of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Eriogonum microthecum var. *lacus-ursi*	Bear Lake buckwheat	None/None/1B.1	None	Great Basin scrub, Lower montane coniferous forest; clay outcrops/perennial shrub/July–Aug/6,560–6,890	Not expected to occur. The study area is located outside of the species' known elevation range,, and there is no suitable vegetation present.
Erythranthe exigua	San Bernardino Mountains monkeyflower	None/None/1B.2	None	Meadows and seeps, Pebble (Pavement) plain, Upper montane coniferous forest; mesic, clay/annual herb/May–July/5,905–7,595	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Erythranthe purpurea	little purple monkeyflower	None/None/1B.2	None	Meadows and seeps, Pebble (Pavement) plain, Upper montane coniferous forest/annual herb/May–June/6,230–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Gilia leptantha ssp. *leptantha*	San Bernardino gilia	None/None/1B.3	None	Lower montane coniferous forest (sandy or gravelly)/annual herb/June–Aug/4,920–8,400	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Heuchera parishii	Parish's alumroot	None/None/1B.3	None	Alpine boulder and rock field, Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest; rocky, sometimes carbonate/perennial rhizomatous herb/June–Aug/4,920–12,465	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Horkelia cuneata var. *puberula*	mesa horkelia	None/None/1B.1	None	Chaparral (maritime), Cismontane woodland, Coastal scrub; sandy or gravelly/perennial herb/Feb–July(Sep)/225–2,655	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Horkelia wilderae	Barton Flats horkelia	None/None/1B.1	None	Chaparral (edges), Lower montane coniferous forest, Upper montane coniferous forest/perennial herb/May–Sep/5,495–9,595	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Hulsea vestita ssp. *pygmaea*	pygmy hulsea	None/None/1B.3	None	Alpine boulder and rock field, Subalpine coniferous forest; granitic, gravelly/perennial herb/June–Oct/9,300–12,795	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Imperata brevifolia	California satintail	None/None/2B.1	None	Chaparral, Coastal scrub, Mojavean desert scrub, Meadows and seeps (often alkali), Riparian scrub; mesic/perennial rhizomatous herb/Sep–May/0–3,985	Low potential to occur. The study area is located within the species' known elevation range and mesic conditions are present within Calimesa Creek; however, the site lacks alkali conditions to support this species. The nearest known occurrence is approximately 5 miles northwest of the study area (CDFW 2019).
Ivesia argyrocoma var. *argyrocoma*	silver-haired ivesia	None/None/1B.2	None	Meadows and seeps (alkaline), Pebble (Pavement) plain, Upper montane coniferous forest/perennial herb/(May)June–Aug/4,795–9,710	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Juglans californica	Southern California black walnut	None/None/4.2	Covered	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland; alluvial/perennial deciduous tree/Mar–Aug/160–2,955	Observed. This species was observed along the banks of Calimesa Creek east of Park Avenue and west of 5th Street.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/None/1B.1	Criteria Area Survey Plant Species	Marshes and swamps (coastal salt), Playas, Vernal pools/annual herb/Feb–June/0–4,005	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Lewisia brachycalyx	short-sepaled lewisia	None/None/2B.2	None	Lower montane coniferous forest, Meadows and seeps; mesic/perennial herb/(Feb)Apr–June(July)/4,490–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Lilium parryi	lemon lily	None/None/1B.2	Covered	Lower montane coniferous forest, Meadows and seeps, Riparian forest, Upper montane coniferous forest; mesic/perennial bulbiferous herb/July–Aug/4,000–9,005	Not expected to occur. The study area is located outside of the species' known elevation range.
Malacothamnus parishii	Parish's bush-mallow	None/None/1A	None	Chaparral, Coastal scrub/perennial deciduous shrub/June–July/1,000–1,495	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Mentzelia tricuspis	spiny-hair blazing star	None/None/2B.1	None	Mojavean desert scrub; sandy, gravelly, slopes, and washes/annual herb/Mar–May/490–4,200	Not expected to occur. No suitable vegetation present.
Monardella macrantha ssp. *hallii*	Hall's monardella	None/None/1B.3	Covered	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland/perennial rhizomatous herb/June–Oct/2,395–7,200	Not expected to occur. The study area is located within the species' known elevation range; however, no suitable is present.
Nama stenocarpa	mud nama	None/None/2B.2	Criteria Area Survey Plant Species	Marshes and swamps (lake margins, riverbanks)/annual / perennial herb/Jan–July/15–1,640	Not expected to occur. The study area is located outside of the species' known elevation range and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Navarretia peninsularis	Baja navarretia	None/None/1B.2	None	Chaparral (openings), Lower montane coniferous forest, Meadows and seeps, Pinyon and juniper woodland; mesic/annual herb/(May)June–Aug/4,920–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Oxytropis oreophila var. *oreophila*	rock-loving oxytrope	None/None/2B.3	None	Alpine boulder and rock field, Subalpine coniferous forest; gravelly or rocky/perennial herb/June–Sep/11,150–12,465	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Packera bernardina	San Bernardino ragwort	None/None/1B.2	None	Meadows and seeps (mesic, sometimes alkaline), Pebble (Pavement) plain, Upper montane coniferous forest/perennial herb/May–July/5,905–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Parnassia cirrata var. *cirrata*	San Bernardino grass-of-Parnassus	None/None/1B.3	None	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest; mesic, streamsides, sometimes calcareous/perennial herb/Aug–Sep/4,100–8,005	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Perideridia parishii ssp. *parishii*	Parish's yampah	None/None/2B.2	None	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest/perennial herb/June–Aug/4,805–9,845	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Petalonyx linearis	narrow-leaf sandpaper-plant	None/None/2B.3	None	Mojavean desert scrub, Sonoran desert scrub; Sandy or rocky canyons/perennial shrub/(Jan–Feb)Mar–May(June–Dec)/-80–3,660	Not expected to occur. No suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Phlox dolichantha	Big Bear Valley phlox	None/None/1B.2	None	Pebble (Pavement) plain, Upper montane coniferous forest (openings)/perennial herb/May–July/6,000–9,745	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Physaria kingii ssp. *bernardina*	San Bernardino Mountains bladderpod	FE/None/1B.1	None	Lower montane coniferous forest, Pinyon and juniper woodland, Subalpine coniferous forest; usually carbonate/perennial herb/May–June/6,065–8,860	Not expected to occur. The study area is located outside of the species' known elevation range and there is no suitable vegetation present. The nearest known occurrence is approximately 20 miles northeast of the study area (CDFW 2019).
Poa atropurpurea	San Bernardino blue grass	FE/None/1B.2	None	Meadows and seeps (mesic)/perennial rhizomatous herb/(Apr)May–July(Aug)/4,460–8,055	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 15.5 miles northeast of the study area (CDFW 2019).
Pyrrocoma uniflora var. *gossypina*	Bear Valley pyrrocoma	None/None/1B.2	None	Meadows and seeps, Pebble (Pavement) plain/perennial herb/July–Sep/5,245–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Ribes divaricatum var. *parishii*	Parish's gooseberry	None/None/1A	None	Riparian woodland/perennial deciduous shrub/Feb–Apr/210–985	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Sidalcea hickmanii ssp. *parishii*	Parish's checkerbloom	None/SR/1B.2	None	Chaparral, Cismontane woodland, Lower montane coniferous forest/perennial herb/(May)June–Aug/3,280–8,200	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Sidalcea malviflora ssp. *dolosa*	Bear Valley checkerbloom	None/None/1B.2	None	Lower montane coniferous forest (meadows and seeps), Meadows and seeps, Riparian woodland, Upper montane coniferous forest (meadows and seeps)/perennial herb/May–Aug/4,900–8,810	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Sidalcea neomexicana	salt spring checkerbloom	None/None/2B.2	None	Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Playas; alkaline, mesic/perennial herb/Mar–June/45–5,020	Not expected to occur. No suitable vegetation present.
Sidalcea pedata	bird-foot checkerbloom	FE/SE/1B.1	None	Meadows and seeps (mesic), Pebble (Pavement) plain/perennial herb/May–Aug/5,245–8,200	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 13 miles north of the study area (CDFW 2019).
Streptanthus campestris	southern jewelflower	None/None/1B.3	None	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland; rocky/perennial herb/(Apr)May–July/2,950–7,545	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Symphyotrichum defoliatum	San Bernardino aster	None/None/1B.2	None	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Valley and foothill grassland (vernally mesic); near ditches, streams, springs/perennial rhizomatous herb/July–Nov(Dec)/5–6,695	Low potential to occur. The study area is located within the species' known elevation range, and mesic conditions are present within Calimesa Creek. However, the study area is located within a highly urbanized setting containing a high cover of ornamental plantings and anthropogenic disturbances within Calimesa Creek (i.e., trash, debris, litter, homeless encampments). The nearest known occurrence is approximately 3.2 miles west of the study area within San Timoteo Canyon (CDFW 2019).
Taraxacum californicum	California dandelion	FE/None/1B.1	None	Meadows and seeps (mesic)/perennial herb/May–Aug/5,310–9,185	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 14.6 miles northeast of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State/ CRPR)	MSHCP	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Thelypodium stenopetalum	slender-petaled thelypodium	FE/SE/1B.1	None	Meadows and seeps (mesic, alkaline)/perennial herb/May–Sep/5,245–8,200	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present. The nearest known occurrence is approximately 18.5 miles northeast of the study area (CDFW 2019).
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern	None/None/2B.2	None	Meadows and seeps (seeps and streams)/perennial rhizomatous herb/Jan–Sep/160–2,000	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	None/None/2B.1	Narrow Endemic Plant Species	Meadows and seeps, Marshes and swamps, Riparian forest, Vernal pools; alkaline/annual herb/May–Sep/15–1,425	Not expected to occur. The study area is located outside of the species' known elevation range.
Viola pinetorum ssp. *grisea*	grey-leaved violet	None/None/1B.2	None	Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest/perennial herb/Apr–July/4,920–11,155	Not expected to occur. The study area is located outside of the species' known elevation range, and there is no suitable vegetation present.

Federal
FE: Federally listed as endangered
FT: Federally listed as threatened
State
SE: State listed as endangered
SR: State listed as rare

CRPR: California Rare Plant Rank
1A: Plants presumed extirpated in California and either rare or extinct elsewhere
1B: Plants rare, threatened, or endangered in California and elsewhere
2B: Plants rare, threatened, or endangered in California, but more common elsewhere
4: Plants of Limited Distribution – A Watch List

Threat Rank
0.1 – Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
0.2 – Moderately threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
0.3 – Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

MSHCP: Western Riverside County Multiple Species Habitat Conservation Plan

Attachment F

Special-Status Wildlife Species Detected or Potentially Occurring in the Study Area

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Amphibians					
Rana draytonii	California red-legged frog	FT/SSC	Covered	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands.	Not expected to occur. The study area contains an ephemeral drainage (Calimesa Creek); however, this feature does not contain perennial waters to support this species. The nearest known occurrence is approximately 14 miles northwest of the study area (CDFW 2019).
Rana muscosa	mountain yellow-legged frog	FE/SE, WL	Covered	Lakes, ponds, meadow streams, isolated pools, and open riverbanks; rocky canyons in narrow canyons and in chaparral.	Not expected to occur. The study area does not support suitable aquatic habitat in rocky canyons to support this species. The nearest known occurrence is approximately 8.6 miles northeast of the study area (CDFW 2019).
Spea hammondii	western spadefoot	None/SSC	Covered	Primarily grassland and vernal pools, but also in ephemeral wetlands that persist at least 3 weeks in chaparral, coastal scrub, valley–foothill woodlands, pastures, and other agriculture.	Not expected to occur. The study area does not support grasslands and coastal scrub and lacks vernal pools to support this species. The majority of the study area has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 4 miles west of the site (CDFW 2019).
Reptiles					
Actinemys marmorata	northwestern pond turtle	None/SSC	Covered	Slow-moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter.	Not expected to occur. The study area does not support permanent or intermittent aquatic habitat for this species. Calimesa Creek bisects the study area; however, it is an ephemeral drainage that lacks slow-moving permanent or intermittent flows.
Anniella stebbinsi	southern California legless lizard	None/SSC	None	Coastal dunes, stabilized dunes, beaches, dry washes, valley–foothill, chaparral, and scrubs; pine, oak, and riparian woodlands; associated with sparse vegetation and moist sandy or loose, loamy soils.	Low potential to occur. Sparse vegetation and loamy soils are present. A known occurrence overlaps the study area; however, it is described as occurring north of the study area near Yucaipa Boulevard and 5th Street. There are numerous other occurrences within 5 miles of the study area (CDFW 2019); however, the majority of the study area has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Arizona elegans occidentalis	California glossy snake	None/SSC	None	Commonly occurs in desert regions throughout Southern California. Prefers open sandy areas with scattered brush. Also found in rocky areas.	Not expected to occur. Open areas with scattered brush and rocky areas are present; however, this species commonly occur in desert regions. The nearest occurrence is approximately 7.6 miles northwest of the study area (CDFW 2019).
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	None/SSC	Covered	Hot and dry areas with sparse foliage, including chaparral, woodland, and riparian areas.	Low potential to occur. Suitable woodland habitat with sparse understory is present; however, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 4.2 miles west of the study area (CDFW 2019).
Charina umbratica	southern rubber boa	None/ST	Covered	Montane oak–conifer and mixed-conifer forests, montane chaparral, wet meadows; usually in vicinity of streams or wet meadows.	Not expected to occur. The study area is outside of the elevation range of the species; the species is known from the San Bernardino and San Jacinto Mountains. The nearest known occurrence is approximately 2.7 miles east of the study area (CDFW 2019).
Crotalus ruber	red diamondback rattlesnake	None/SSC	Covered	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats.	Not expected to occur. The study area is located in a highly urbanized area, and lacks suitable rocky substrate, and open habitat to support this species. The nearest known occurrence is approximately 4.7 miles west of the study area (CDFW 2019).
Phrynosoma blainvillii	Blainville's horned lizard	None/SSC	Covered	Open areas of sandy soil in valleys, foothills, and semi-arid mountains including coastal scrub, chaparral, valley–foothill hardwood, conifer, riparian, pine–cypress, juniper, and annual grassland habitats.	Low potential to occur. The study area supports a minimal amount of potentially suitable habitat (i.e., open sandy areas within Calimesa Creek); however, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest known occurrence is approximately 4.8 miles southeast of the study area (CDFW 2019).
Salvadora hexalepis virgultea	coast patch-nosed snake	None/SSC	None	Brushy or shrubby vegetation; requires small mammal burrows for refuge and overwintering sites.	Not expected to occur. The study area supports a minimal amount of brushy or shrubby vegetation to support this species; however, no small mammal burrows were observed during the September 2019 site visit. The nearest known occurrence is approximately 4.8 miles northeast of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Thamnophis hammondii	two-striped gartersnake	None/SSC	None	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools.	Not expected to occur. While Calimesa Creek does flow through the study area, this feature does not support a rocky bed or perennial waters to support this species. The nearest known occurrence is approximately 6.8 miles north and west of the study area within the San Bernardino National Forest (CDFW 2019).
			Birds		
Agelaius tricolor (nesting colony)	tricolored blackbird	BCC/SSC, ST	Covered	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture.	Not expected to nest due to lack of suitable wetland and marsh habitat. The nearest known occurrence is approximately 2.3 miles southwest of the study area (CDFW 2019).
Aquila chrysaetos (nesting & wintering)	golden eagle	BCC/FP, WL	Covered	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees in open areas and on cliffs in open areas and forages in open habitats.	Not expected to nest. Low potential to forage. The study area lacks suitable nesting habitat (i.e., large trees in open areas and on cliffs in open areas). The study area has limited suitable open areas for foraging. The nearest occurrence is approximately 1.5 miles south of the study area from San Timoteo Creek (CDFW 2019).
Athene cunicularia (burrow sites & some wintering sites)	burrowing owl	BCC/SSC	Covered	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows.	Low potential to occur. Vacant lots within the eastern portion of the study area contain open habitat providing line-of-sight, and California ground squirrels and potentially suitable burrows were present. However, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest known occurrence is approximately 8.7 miles south of the study area (CDFW 2019).
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST	Covered	Nests in open woodland and savanna, riparian, and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture.	Not expected to nest. Low potential to forage. The study area is outside the nesting range of the species; however, the species may roost and forage in the study area during migration. The nearest known occurrence is from 1900, considered possibly extirpated, and is approximately 1 mile south of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Coccyzus americanus occidentalis (nesting)	western yellow-billed cuckoo	FT, BCC/SE	Covered	Nests in dense, wide riparian woodlands and forest with well-developed understories.	Not expected to nest or forage. The study area does not support dense or wide riparian woodlands with well-developed understories to nest and/or winter. The nearest known occurrence is approximately 11.1 miles west of the study area (CDFW 2019).
Cypseloides niger (nesting)	black swift	BCC/SSC	Covered	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats.	Not expected to nest or forage. The study area does not contain caves or cliffs within canyons and the nearest known occurrence is approximately 10.2 miles northeast of the study area (CDFW 2019).
Elanus leucurus (nesting)	white-tailed kite	None/FP	Covered	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands.	Low potential to nest and forage. The study area supports a minor amount of woodlands (i.e., eucalyptus/tree of heaven/black locust groves and Fremont cottonwood forest) for this species to nest; however, the woodland lacks adjacent foraging habitat. There are three known occurrences within 2 miles of the study area within San Timoteo Canyon (CDFW 2019).
Empidonax traillii extimus (nesting)	southwestern willow flycatcher	FE/SE	Covered	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration.	Not expected to occur. The study area does not contain dense riparian habitats that would support this species. The nearest known occurrence is approximately 5.2 miles south of the study area (CDFW 2019).
Haliaeetus leucocephalus (nesting & wintering)	bald eagle	FD, BCC/FP, SE	Covered	Nests in forested areas adjacent to large bodies of water, including seacoasts, rivers, swamps, large lakes; winters near large bodies of water in lowlands and mountains.	Not expected to nest or winter. The study area does not contain large bodies of water, dense riparian, or other suitable habitats that would support this species. The nearest known occurrence is approximately 17 miles north of the study area within the San Bernardino National Forest (CDFW 2019).
Icteria virens (nesting)	yellow-breasted chat	None/SSC	Covered	Nests and forages in dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush.	Not expected to nest or forage. The study area does not contain dense, wide, riparian thickets that would support this species. The nearest known occurrence is approximately 2.6 miles south of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Lanius ludovicianus (nesting)	loggerhead shrike	BCC/SSC	Covered	Nests and forages in open habitats with scattered shrubs, trees, or other perches.	Low potential to occur. The study area supports scattered shrubs and trees to support this species; however, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed (Google Earth 2019 and NETROnline 2019). The nearest known occurrence is approximately 5.8 miles west of the study area (CDFW 2019).
Polioptila californica californica	coastal California gnatcatcher	FT/SSC	Covered	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%; majority of nesting at less than 1,000 feet above mean sea level.	Not expected to occur. The study area does not contain suitable coastal scrub to support this species, and the study area is located outside of the species' known elevation range. The nearest known occurrence is approximately 7.5 miles north of the study area (CDFW 2019).
Progne subis (nesting)	purple martin	None/SSC	Covered	Nests and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways.	Not expected to nest. Low potential to forage. The study area is outside the nesting range of the species; however, the species may roost and forage in the study area during migration. The nearest known occurrence is from 1910 and is approximately 5.3 miles south of the study area (CDFW 2019).
Setophaga petechia (nesting)	yellow warbler	BCC/SSC	Covered	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine, and mixed-conifer habitats.	Low potential to occur. The study area supports a minor amount of woodlands (i.e., eucalyptus/tree of heaven/black locust groves and Fremont cottonwood forest that contain scattered oaks; however, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years (Google Earth 2019 and NETROnline 2019). The nearest known occurrence is approximately 2.5 miles south of the study area within San Timoteo Creek (CDFW 2019).
Vireo bellii pusillus (nesting)	least Bell's vireo	FE/SE	Covered	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season.	Not expected to nest or forage. The study area does not contain dense, wide, riparian thickets that would support this species. The nearest known occurrence is approximately 2.5 miles south of the study area within San Timoteo Creek (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Fishes					
Catostomus santaanae	Santa Ana sucker	FT/None	Covered	Small, shallow, cool, clear streams less than 7 meters (23 feet) in width and a few centimeters to more than a meter (1.5 inches to more than 3 feet) in depth; substrates are generally coarse gravel, rubble, and boulder.	Not expected to occur. The study area does not support perennial aquatic habitat for this species. The nearest known occurrence is approximately 14 miles north of the study area (CDFW 2019).
Oncorhynchus mykiss irideus pop. *10*	southern steelhead - southern California DPS	FE/None	None	Clean, clear, cool, well-oxygenated streams; needs relatively deep pools in migration and gravelly substrate to spawn.	Not expected to occur. The study area does not support perennial aquatic habitat for this species. The nearest known occurrence is possibly extirpated and approximately 7.4 miles north of the study area within the Santa Ana River (CDFW 2019).
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None/SSC	None	Headwaters of the Santa Ana and San Gabriel Rivers; may be extirpated from the Los Angeles River system.	Not expected to occur. The study area does not support perennial aquatic habitat for this species. The nearest known occurrence is approximately 5.2 miles north of the study area (CDFW 2019).
Mammals					
Antrozous pallidus	pallid bat	None/SSC	None	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees.	Low potential to roost and forage. The study area supports man-made structures and trees for roosting and a minor amount of open habitat (i.e., vacant ruderal lots) are present for foraging; however, the nearest known occurrence is approximately 6.7 miles northwest of the study area (CDFW 2019).
Chaetodipus californicus femoralis	Dulzura pocket mouse	None/SSC	None	Open habitat, coastal scrub, chaparral, oak woodland, chamise chaparral, mixed-conifer habitats; disturbance specialist; 0 to 3,000 feet above mean sea level.	Low potential to occur. The study area is within the elevation range for this species, and marginal habitat is present. However, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 10.2 miles southeast of the site (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	None/SSC	Covered	Coastal scrub, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon–juniper, and annual grassland.	Low potential to occur. Sparse habitat and stream terraces are present along Calimesa Creek and there are numerous occurrences within 5 miles of the study area (CDFW 2018). However, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019).
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE/SSC	Covered	Sparse scrub habitat, alluvial scrub/coastal scrub habitats on gravelly and sandy soils near river and stream terraces.	Not expected to occur. The study area contains stream terraces within Calimesa Creek. However, the study area lacks suitable coastal scrub habitats to support this species, and it is located within a highly urbanized area. The nearest known occurrence is approximately 4.9 miles north of the study area (CDFW 2019).
Dipodomys stephensi	Stephens' kangaroo rat	FE/ST	Covered	Annual and perennial grassland habitats, coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas.	Not expected to occur. The study area contains disturbed areas; however, it lacks suitable coastal scrub habitats to support this species and is located within a highly urbanized area. The nearest known occurrence is approximately 4.8 miles north of the study area (CDFW 2019).
Eumops perotis californicus	western mastiff bat	None/SSC	None	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees, and tunnels.	Not expected to roost, low potential to forage. The study does not canyons or cliffs for roosting, but does contain a minor amount of woodlands for foraging. However, the nearest known occurrence is approximately 9.6 miles southwest of the study area (CDFW 2019).
Glaucomys oregonensis californicus	San Bernardino flying squirrel	None/SSC	Covered	Coniferous and deciduous forests, including riparian forests	Not expected to occur. The study area is outside of the species range; this species is known from the San Bernardino Mountains with the nearest occurrence is 9.6 miles northeast of the study area (CDFW 2019).
Lasiurus xanthinus	western yellow bat	None/SSC	None	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	Low potential to roost and forage. The study area supports Fremont cottonwood forest and scattered palms for roosting. However, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 1 mile north of the site (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Leptonycteris yerbabuenae	lesser long-nosed bat	FD/None	None	Sonoran desert scrub, semi-desert grasslands, lower oak woodlands	Low potential to roost and forage. The study area supports a minimal amount of scattered oaks to support this species however, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 1 mile north of the site (CDFW 2019).
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/SSC	Covered	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed areas, and rangelands.	Not expected to occur. The study area supports disturbed areas and some open habitats (i.e., Calimesa Creek and vacant lots); however, the study area is located in a highly urbanized area. The nearest occurrence is approximately 5.2 miles south of the study area (CDFW 2019).
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC	Covered	Coastal scrub, desert scrub, chaparral, cacti, rocky areas.	Not expected to occur. The study area does not contain suitable habitat to support this species and is located in a highly urbanized area. The nearest occurrence is approximately 3.9 miles north of the study area (CDFW 2019).
Nyctinomops femorosaccus	pocketed free-tailed bat	None/SSC	None	Pinyon–juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oases; roosts in high cliffs or rock outcrops with drop-offs, caverns, and buildings.	Not expected to roost or forage. The study area does not contain suitable desert habitat or dense palm oasis to support foraging and does not contain rock outcrops or caverns for roosting. The nearest occurrence is approximately 10.4 miles northwest of the study area (CDFW 2019).
Onychomys torridus ramona	southern grasshopper mouse	None/SSC	None	Grassland and sparse coastal scrub.	Low potential to occur. The study area does not support coastal scrub, but does contain open areas with some cover of grasses (i.e., Calimesa Creek and vacant lots); However, this small patch of habitat in the study area is isolated within an area that has been developed for over 50 years, and the non-developed areas have been substantially disturbed by mowing and tilling (Google Earth 2019 and NETROnline 2019). The nearest occurrence is approximately 4.8 miles northwest of the study area (CDFW 2019).
Perognathus alticolus alticolus	white-eared pocket mouse	None/SSC	None	Arid ponderosa pine communities	Not expected to occur. The study area lacks suitable ponderosa pine communities to support this species. The nearest occurrence is approximately 17 miles northwest of the study area (CDFW 2019).

Scientific Name	Common Name	Status (Federal/State)	MSHCP	Habitat	Potential to Occur
Perognathus longimembris brevinasus	Los Angeles pocket mouse	None/SSC	Covered	Lower-elevation grassland, alluvial sage scrub, and coastal scrub.	Not expected to occur. The study area lack suitable habitat to support this species and is located in a highly urbanized area. The nearest occurrence is approximately 5.3 miles east of the study area (CDFW 2019).
Taxidea taxus	American badger	None/SSC	None	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils.	Not expected to occur. The study area is located in a highly urbanized area and does not contain adequate open habitat to support this species. The nearest occurrence is approximately 7.3 miles northeast of the study area (CDFW 2019).

Status Legend
Federal
BCC: USFWS – Birds of Conservation Concern
FD: Federally delisted; monitored for 5 years
FE: Federally listed as endangered
FT: Federally listed as threatened
State
FP: CDFW Fully Protected Species
SE: State listed as endangered
ST: State listed as threatened
SSC: California Species of Special Concern
MSHCP: Western Riverside County Multiple Species Conservation Plan

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Calimesa Creek Stage III Project
Aquatics Resources Delineation Report

Prepared for:

TKE Engineering Inc.
2305 Chicago Avenue
Riverside, California 92507
Contact: Steve Ledbetter, PE

Prepared by:

DUDEK
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Encinitas, California 92501
Contact: Megan Enright

NOVEMBER 2020

Printed on 30% post-consumer recycled material.

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APPENDICES

TABLES

This Aquatic Resources Delineation Report is being provided to the U.S. Army Corps of Engineers (ACOE) in accordance with the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (ACOE 2016). This report and supporting appendices provide the 20 items listed in the Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (ACOE 2016).

Item 1: Request for a Jurisdictional Determination

Appendix A contains the ACOE Regulatory Program Approved Jurisdictional Determination Form (Interim) Navigable Waters Protection Rule (July 2020).

Item 2: Contact Information

Applicant	City of Calimesa	**Agent**	Dudek
Contact Name	Kelly Lucia, Planning Director	**Contact Name**	Megan Enright
Address	908 Park Avenue Calimesa, California 92320	**Address**	605 Third Street Encinitas, California 92024
Phone	909.809.8778	**Phone**	760.420.7833
Fax	NA	**Fax**	NA
Email	klucia@cityofcalimesa.net	**Email**	menright@dudek.com

Item 3: Site Access

The project applicant or agent will accompany ACOE staff to the Calimesa Creek Stage III Project (project) if site visits are deemed necessary.

Item 4: Directions to the Project Site

The 28.2-acre review area is located south of County Line Road, east of Interstate 10, and west of 3rd Street in the City of Calimesa in Riverside County (Figure 1; Figures included in Appendix B). The review area is within U.S. Geological Survey 7.5-minute Yucaipa quadrangle map, Sections 11, 12, 13, and 14 of Township 2 South, Range 2 West (Figure 2 of Appendix B). The review area consists of two discontinuous polygons separated by approximately 1,640 feet. The approximate center of the western polygon of the review area is longitude 117°03'35″W and latitude 33°00'14″N, and the approximate center of the of the eastern polygon of the review area is longitude 117°02'56″W and latitude 33°00'12″N.

To drive to the western polygon of the review area, take Interstate 10, exit on County Line Road, and head east. Take Calimesa Boulevard and head south. Calimesa Creek is approximately 150 feet south of the intersection of County Line Road and Calimesa Boulevard on Calimesa Boulevard. The downstream portion of the western polygon of the review area starts approximately 380 feet west of Calimesa Boulevard. The remainder of the western polygon is approximately 135 feet west of the intersection of Calimesa Creek and 5th Street. To drive to the eastern polygon of the review area, head east on County Line Road from its intersection with Calimesa Boulevard. The eastern polygon of the review area is approximately 2,000 feet east of the intersection of 5th Street and County Line Road.

Item 5: Jurisdictional Delineation Methods

The ACOE wetlands delineation was performed in accordance with the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (ACOE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008a), A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual (ACOE 2008b), and guidance provided by ACOE and the U.S. Environmental Protection Agency on the geographic extent of jurisdiction based on the U.S. Supreme Court's interpretation of the Clean Water Act (ACOE and EPA 2008).

Item 6: Aquatic Resources Narrative

The review area contains one ephemeral drainage (Calimesa Creek). Calimesa Creek conveys water that connects to Temescal Canyon Wash approximately 7 miles downstream, which ultimately flows to the Santa Ana River. Within the review area, the drainage includes a concrete-lined trapezoidal channel containing Calimesa Creek. The downstream portion of Calimesa Creek, west of 5th Street, includes a sandy bottom earthen-lined channel that is subject to frequent scouring associated with annual storm events. While the unvegetated channel within the review area was composed primarily of bare ground and a sandy substrate, a low percent cover of plant species was observed in the review area and include sacred thorn-apple (*Datura wrightii*) and bromes (*Bromus* spp.).There are approximately 0.89 acres of ephemeral drainage within the review area identified in Figure 3 of Appendix B. This 0.89 acres of ephemeral drainage is not ACOE-jurisdictional because it is a (b)(3) non-jurisdictional waters per Title 33, Part 328.3 of the Code of Federal Regulations.

Wetland determination data forms were completed at one sampling point (WPD-1) to determine the status of three wetland criteria (vegetation, soils, and hydrology) within representative potential jurisdictional aquatic resources within the review area. Four OHWM datasheets (ODP-1 through ODP-4) were recorded at potential non-wetland waters within the review area to determine the status of OHWM indicators within those features. Wetland determination data forms and OHWM datasheets are included as Appendix C, Wetland Determination Data Forms and Ordinary High Water Mark Forms.

Waters of the State

See Appendix D for a discussion of area under the jurisdiction of the California Department of Fish and Wildlife and Regional Water Quality Control Board.

Item 7: Delineation Maps

All maps of delineated aquatic resources are provided in Appendix B.

Item 8: Dates of Field Work

On September 20, 2019, Dudek Biologist Britney Strittmater conducted a jurisdictional delineation for the review area was (Table 1).

Table 1. Schedule of the Jurisdictional Delineation Conducted for the Calimesa Creek Stage III Project

Date	Hours	Personnel	Conditions
September 20, 2019	9:45 a.m. to 2:45 p.m.	Britney Strittmater	no cloud cover; wind speeds from 1 to 3 mph; temperatures ranging from 65°F to 79°F

Item 9: Table of Aquatic Resources

Table 2 includes a description of each non-jurisdictional ephemeral waters identified within the review area, its Cowardin type, any OHWM indicators present, the location, and the acreage/linear feet.

Table 2. U.S. Army Corps of Engineers – Jurisdictional Aquatic Resource Summary

Feature Name	Linear Feet	Acreage	Latitude	Longitude	OHMW Indicators	Cowardin
NWW1a	314	0.12	34° 00' 13" N	117° 03' 46" W	• Changes in vegetation cover • Change in average sediment texture • Change in vegetation species	R4SBC/ Riverine
NWW1b	1,033	0.36	34° 00' 13" N	117° 03' 36" W		
NWW1c	716	0.27	34° 00' 15" N	117° 03' 26" W		
NWW1d	84	0.03	34° 00' 13" N	117° 03' 22" W	• Changes in vegetation cover	
NWW1e	917	0.12	34° 00' 9 " N	117° 02' 57" W		
Total	**3,035**	**0.89**	–	–	–	–

Notes: OHWM = ordinary high water mark.
Totals may not sum due to rounding.

Item 10: Review Area Description

The review area is characterized as a mix of residential and commercial development, and vacant lots. One ephemeral drainage feature (Calimesa Creek) bisects the review area east to west. Based on aerial imagery (Google Earth 2019), vacant lots have been frequently disced, as recently as December 2018. This is presumed to be for weed abatement and fire prevention. Elevations range from approximately 2,380 to 2,500 feet above mean sea level. A mix of developed and undeveloped lands (i.e., vacant lots) to the north, south, east, and west surrounds the review area.

A WETS table is provided in Appendix E for the Yucaipa Station, 4.1 SE. There was climatological data available for June, July, and September 2019. However, there was no data available for August 2019 (NRCS and NWCC 2019).

Item 11: Hydrology

The review area is located within the Santa Ana Hydrologic Unit, San Timoteo Hydrologic Area, and South Mesa Hydrologic Subarea (HSA 801.67). The review area contains one ephemeral drainage (Calimesa Creek). Calimesa Creek conveys water that connects to Temescal Canyon Wash, which has surface connection ultimately flowing to the Santa Ana River (Figure 4 of Appendix B).

Item 12: Remote Sensing

No remote sensing was used for this aquatics resources delineation.

Item 13: Soils

Soil types within the project area are shown on Figure 5 of Appendix B and in Table 3. There are no hydric soils within the review area (USDA 2019).

Table 3. Soils within the Calimesa Creek Stage III Project Review Area

Soil Code	Soil Name	Hydric Rating	Acreage
RaB2	Ramona sandy loam, 2%–5 % slopes, eroded	Not Hydric	16.3
ReC2	Ramona very fine sandy loam, 0%–8% slopes, eroded	Not Hydric	1.2
RmC	Ramona Sandy Loam, 2%–9% slopes	Not Hydric	7.2
SmF2	San Timoteo loam, 25%–50% slopes, eroded	Not Hydric	3.5
		Total	**28.3**

Sources: USDA 2019.
Note: Totals may not sum due to rounding.

Item 14: Site Location Maps

All maps are provided in Appendix B.

Item 15: Aquatic Features Spreadsheet

A copy of the ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is not submitted with this report because Table 2 provides the information requested and there is only one feature.

Item 16: Delineation Maps

All maps are provided in Appendix B.

Item 17: Photographs

Photos of the project site are provided in Appendix F, and the photo point locations are on Figure 3 of Appendix B.

Item 18: Data Forms

Wetland determination data forms and OHWM datasheets along with a summary table are provided in Appendix C.

Item 19: Methods

Jurisdictional boundaries were mapped in the field using a Trimble GeoXT GPS with submeter accuracy and aerial imagery from Digital Globe dated 2018. Following the field work, Ms. Strittmater digitized the aquatic resources using ArcGIS and project-specific, 1-foot contour topography.

Additionally, the delineation defined areas under the jurisdiction of California Department of Fish and Wildlife, pursuant to Sections 1600–1603 of the California Fish and Game Code, and the Regional Water Quality Control Board, pursuant to Clean Water Act Section 401 and the Porter-Cologne Water Quality Control Act. See Appendix D for additional detail regarding California Department of Fish and Wildlife and Regional Water Quality Control Board jurisdictional areas.

Item 20: Digital Data

Geographic information system (GIS) data of the review area and non-jurisdictional ephemeral drainage are located on a CD in Appendix G.

References Cited

ACOE (U.S. Army Corps of Engineers). 1987. *Corps of Engineers Wetlands Delineation Manual*. Online ed. Environmental Laboratory, Wetlands Research Program Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. January 1987. http://www.cpe.rutgers.edu/Wetlands/1987-Army-Corps-Wetlands-Delineation-Manual.pdf.

ACOE. 2008a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* Environmental Laboratory, ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center. September 2008. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046489.pdf.

ACOE. 2008b. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual.* ERDC/CRREL TR-08-12. Prepared by R.W. Lichvar and S.M. McColley. Hanover, New Hampshire: U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory. August 2008. https://apps.dtic.mil/dtic/tr/fulltext/u2/a486603.pdf.

ACOE. 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports.* https://www.spk.usace.army.mil/Portals/12/documents/regulatory/jd/minimum-standards/Minimum_Standards_for_Delineation_with_Template-final.pdf

ACOE and EPA (U.S. Environmental Protection Agency). 2008. *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*. December 2, 2008. https://www.epa.gov/sites/production/files/2016-02/documents/cwa_jurisdiction_following_ rapanos120208.pdf.

Google Earth. 2019. Aerial photograph. 1:200 scale.

NRCS and NWCC (Natural Resources Conservation Services and National Water and Climate Center). 2019. Navigating to Climate Data and Products from the FOTG County Locator. Data downloaded: Climatological data for June, July, and September 2019. Accessed October 15, 2019. https://www.wcc.nrcs.usda.gov/ climate/navigate_wets.htm.

USDA (U.S. Department of Agriculture). 2019. Web Soil Survey. Accessed October 2019. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Appendix A

ACOE Regulatory Program Approved Jurisdictional Determination Form (Interim) Navigable Waters Protection Rule

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): Select.
ORM Number: (e.g. HQS-2020-00001-MSW).
Associated JDs: N/A or ORM numbers and identifiers (e.g. HQS-2020-00001-MSW-MITSITE).
Review Area Location[1]: State/Territory: CA City: Calimesa County/Parish/Borough: Riverside
Center Coordinates of Review Area: Latitude 34.00359665 Longitude 117.0626693

II. FINDINGS

A. Summary: Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

☐ The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.

☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in Section II.B).

☐ There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in Section II.C).

☒ There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in Section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)[2]

§ 10 Name	§ 10 Size		§ 10 Criteria	Rationale for § 10 Determination
N/A.	N/A.	N/A	N/A.	N/A.

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters):[3]				
(a)(1) Name	(a)(1) Size		(a)(1) Criteria	Rationale for (a)(1) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Tributaries ((a)(2) waters):				
(a)(2) Name	(a)(2) Size		(a)(2) Criteria	Rationale for (a)(2) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):				
(a)(3) Name	(a)(3) Size		(a)(3) Criteria	Rationale for (a)(3) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

Adjacent wetlands ((a)(4) waters):				
(a)(4) Name	(a)(4) Size		(a)(4) Criteria	Rationale for (a)(4) Determination
N/A.	N/A.	N/A.	N/A.	N/A.

[1] Map(s)/figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD Form.

D. Excluded Waters or Features

Excluded waters ((b)(1) – (b)(12)):[4]

Exclusion Name	Exclusion Size		Exclusion[5]	Rationale for Exclusion Determination
NWW1a	0.12	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This is an ephemeral portion of Calimesa Creek
NWW1b	0.36	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This is an ephemeral portion of Calimesa Creek
NWW1c	0.27	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This is an ephemeral portion of Calimesa Creek
NWW1d	0.03	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This is an ephemeral portion of Calimesa Creek
NWW1e	0.12	acre(s)	(b)(3) Ephemeral feature, including an ephemeral stream, swale, gully, rill, or pool.	This is an ephemeral portion of Calimesa Creek

III. SUPPORTING INFORMATION

A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

☒ Information submitted by, or on behalf of, the applicant/consultant: Calimesa Creek Stage III Project Aquatics Resources Delineation Report (Dudek 2020)
This information is sufficient for purposes of this AJD.
Rationale: N/A

☐ Data sheets prepared by the Corps: Title(s) and/or date(s).

☒ Photographs: Other: Appendix F of the Aquatics Resources Delineation Report (Dudek 2020)

☐ Corps site visit(s) conducted on: Date(s).

☐ Previous Jurisdictional Determinations (AJDs or PJDs): ORM Number(s) and date(s).

☐ Antecedent Precipitation Tool: *provide detailed discussion in Section III.B*.

☐ USDA NRCS Soil Survey: Title(s) and/or date(s).

☒ USFWS NWI maps: Appendix B, Figure 4 of the Aquatics Resources Delineation Report (Dudek 2020)

[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

☒ USGS topographic maps: Appendix B, Figure 2 of the Aquatics Resources Delineation Report (Dudek 2020)

Other data sources used to aid in this determination:

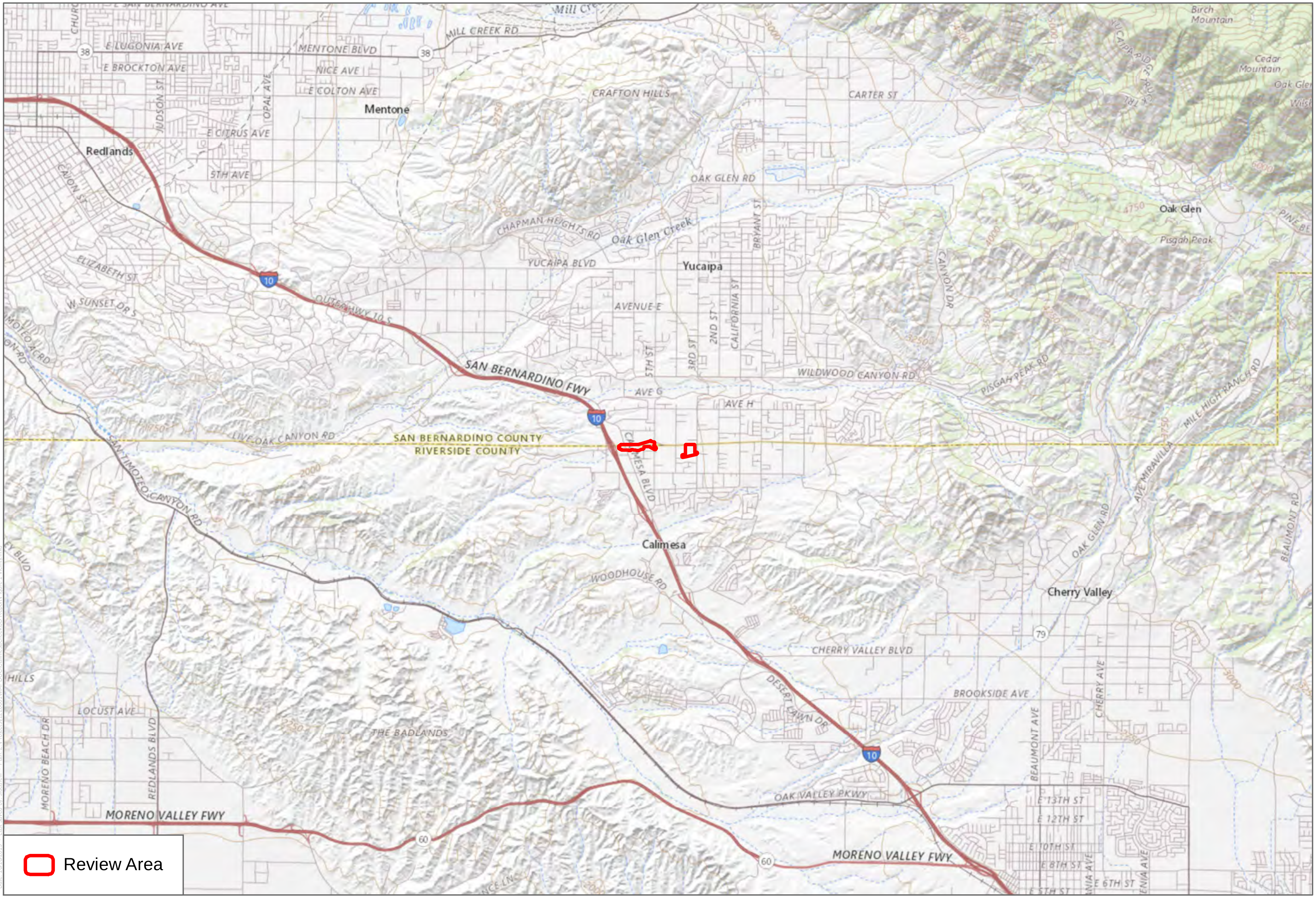
Data Source (select)	Name and/or date and other relevant information
USGS Sources	National Hydrography Data Set. GIS data downloaded January 2020 from https://viewer.nationalmap.gov/basic/?basemap=b1&category=nhd&title=NHD%20View
USDA Sources	USDA (U.S. Department of Agriculture). 2019. Web Soil Survey. Accessed October 2019. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	Dudek. 2020. Calimesa Creek Stage III Project Aquatics Resources Delineation Report. November 2020. Google Earth. 2019. Aerial photograph. 1:200 scale.

B. Typical year assessment(s): N/A

C. Additional comments to support AJD: N/A

Appendix B

Figures



USGS National Map 2019, Yucaipa Quadrangle
Township 2S Range 2W Sections 11-14
NAD83 California Zone VI US Foot

DUDEK

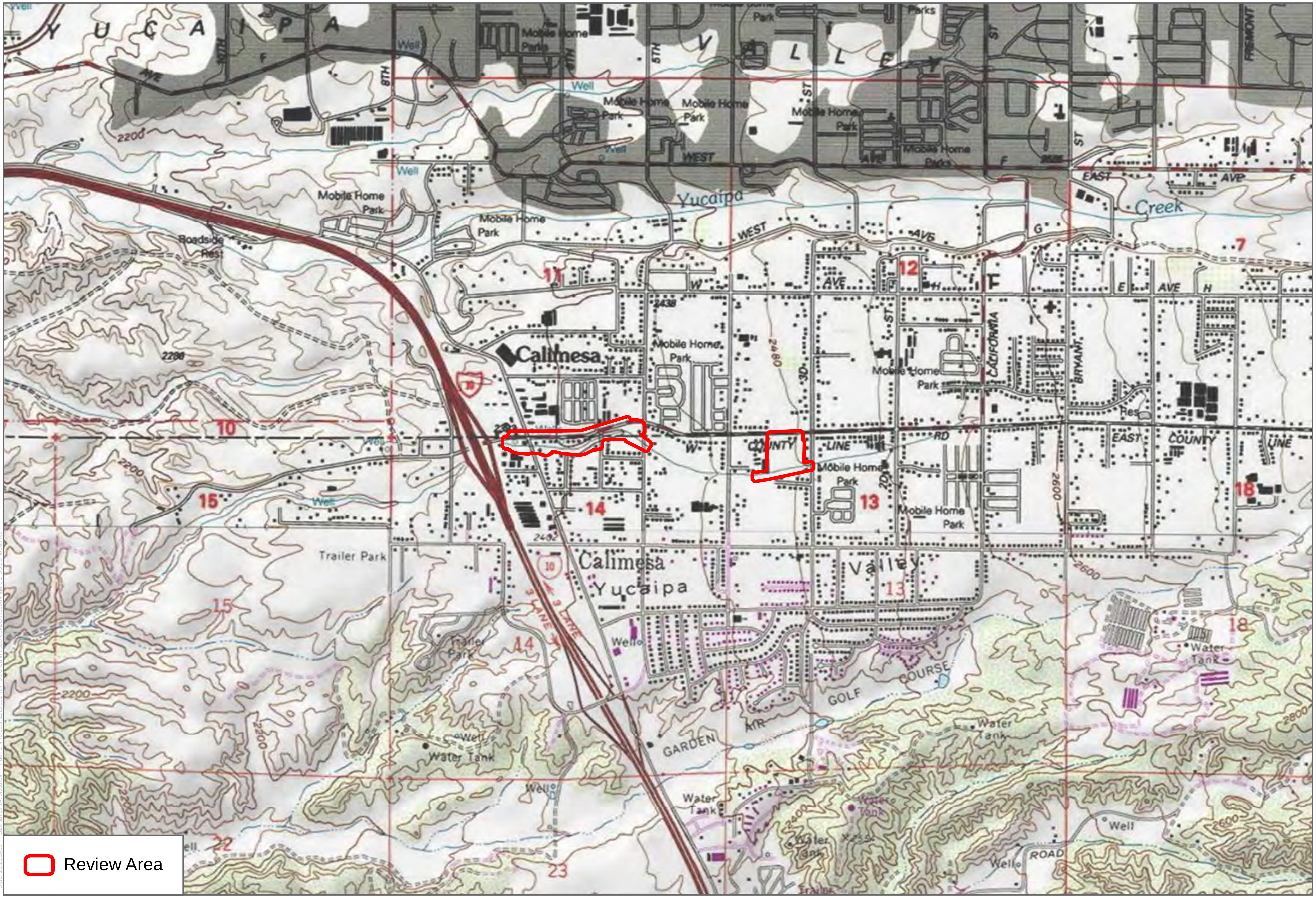
1 inch = 1.5 miles

0 0.75 1.5 Miles

FIGURE 1

Vicinity Map

Calimesa Creek Project - Calimesa, California - 10/16/2019



USGS 7.5-Minute Series Yucaipa Quadrangle
Township 2S Range 2W Sections 11-14
NAD83 California Zone VI US Foot

DUDEK

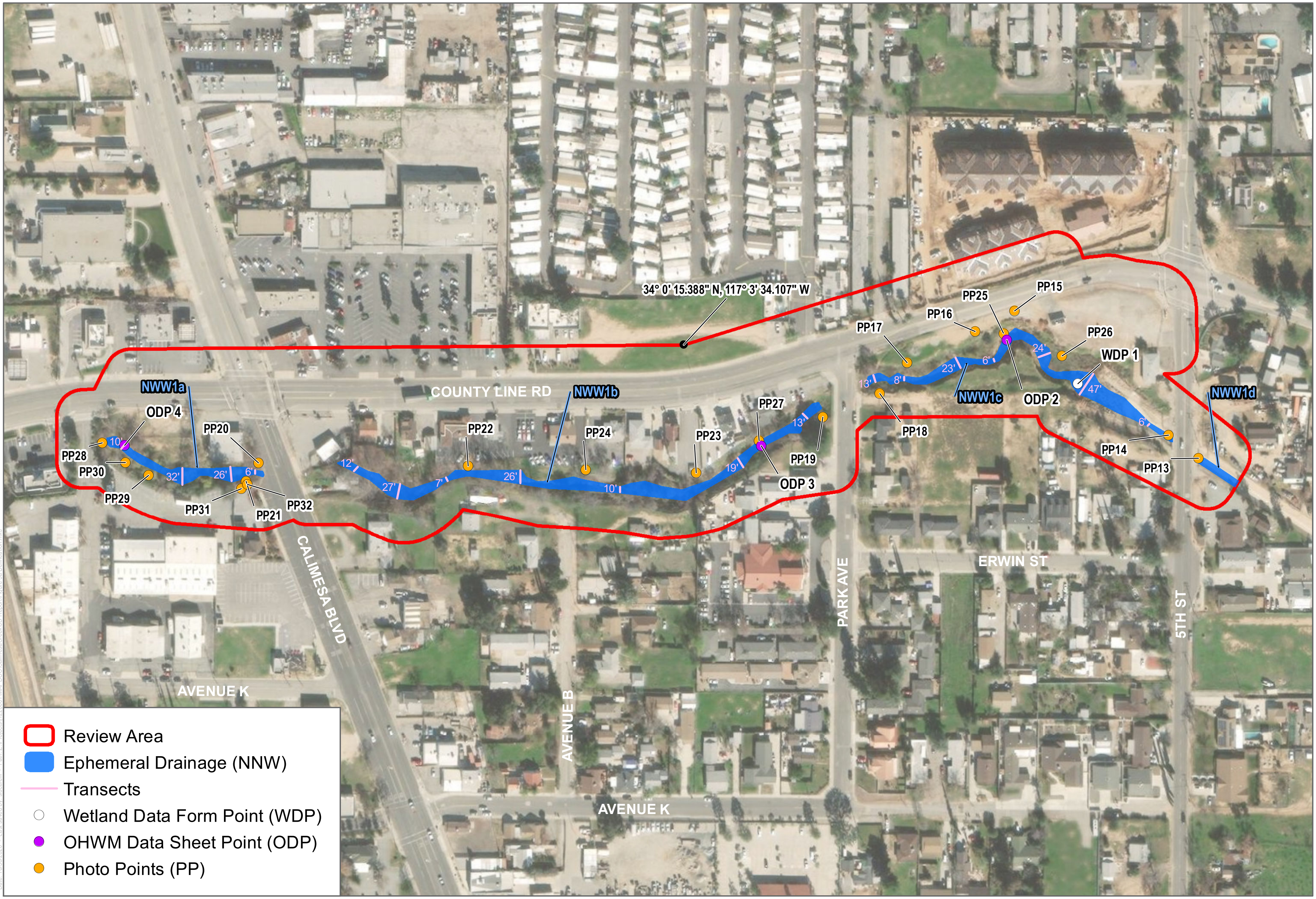
1 inch = 2,000 feet

0 1,000 2,000 Feet

FIGURE 2

USGS Topo Map

Calimesa Creek Project - Calimesa, California - 10/16/2019



DigitalGlobe 2018
NAD83 California Zone VI US Foot

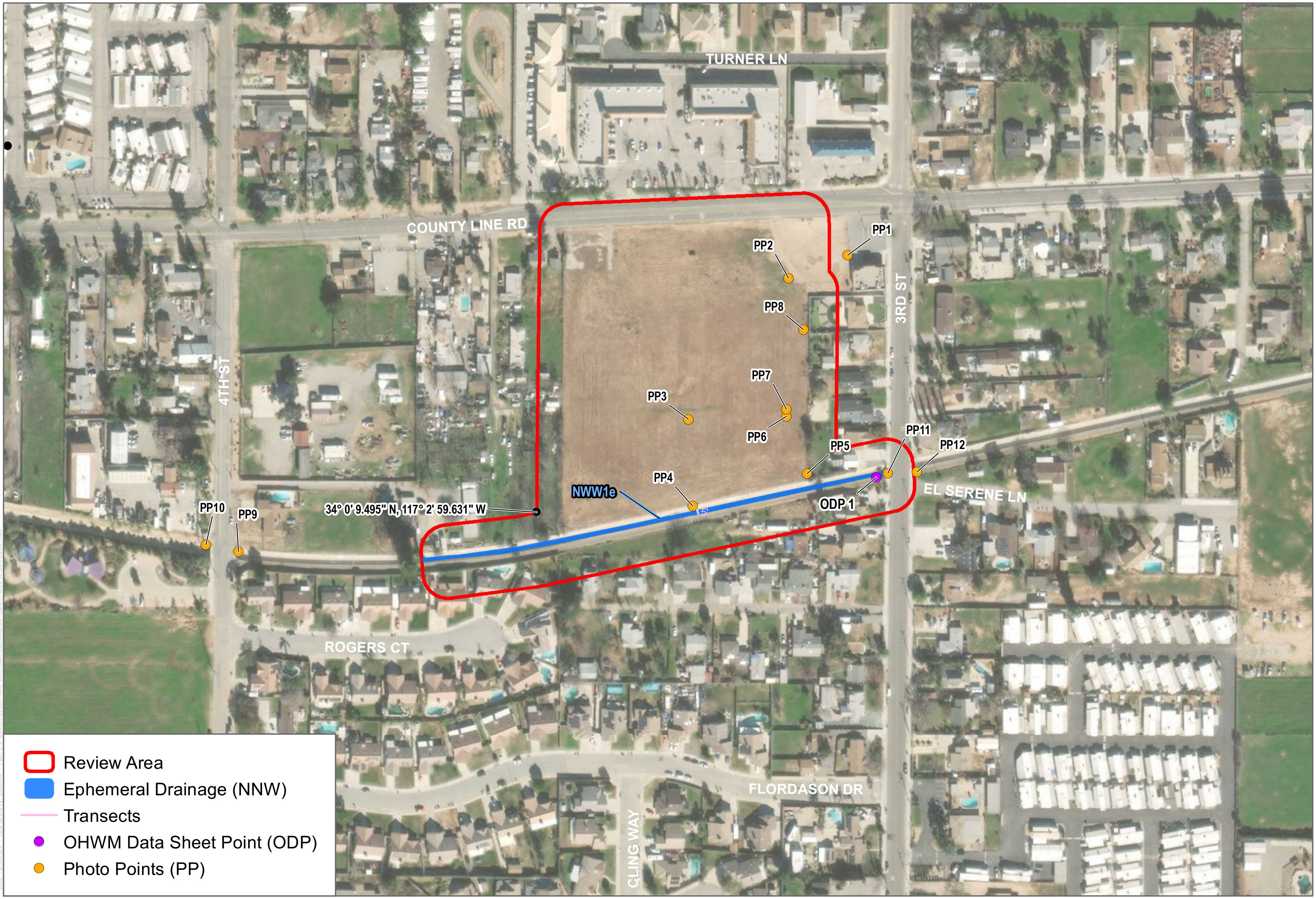
DUDEK

1 inch = 250 feet
0 125 250 Feet

FIGURE 3a

Aquatic Resource Delineation Map

Calimesa Creek Project - Calimesa, California - 10/30/2020



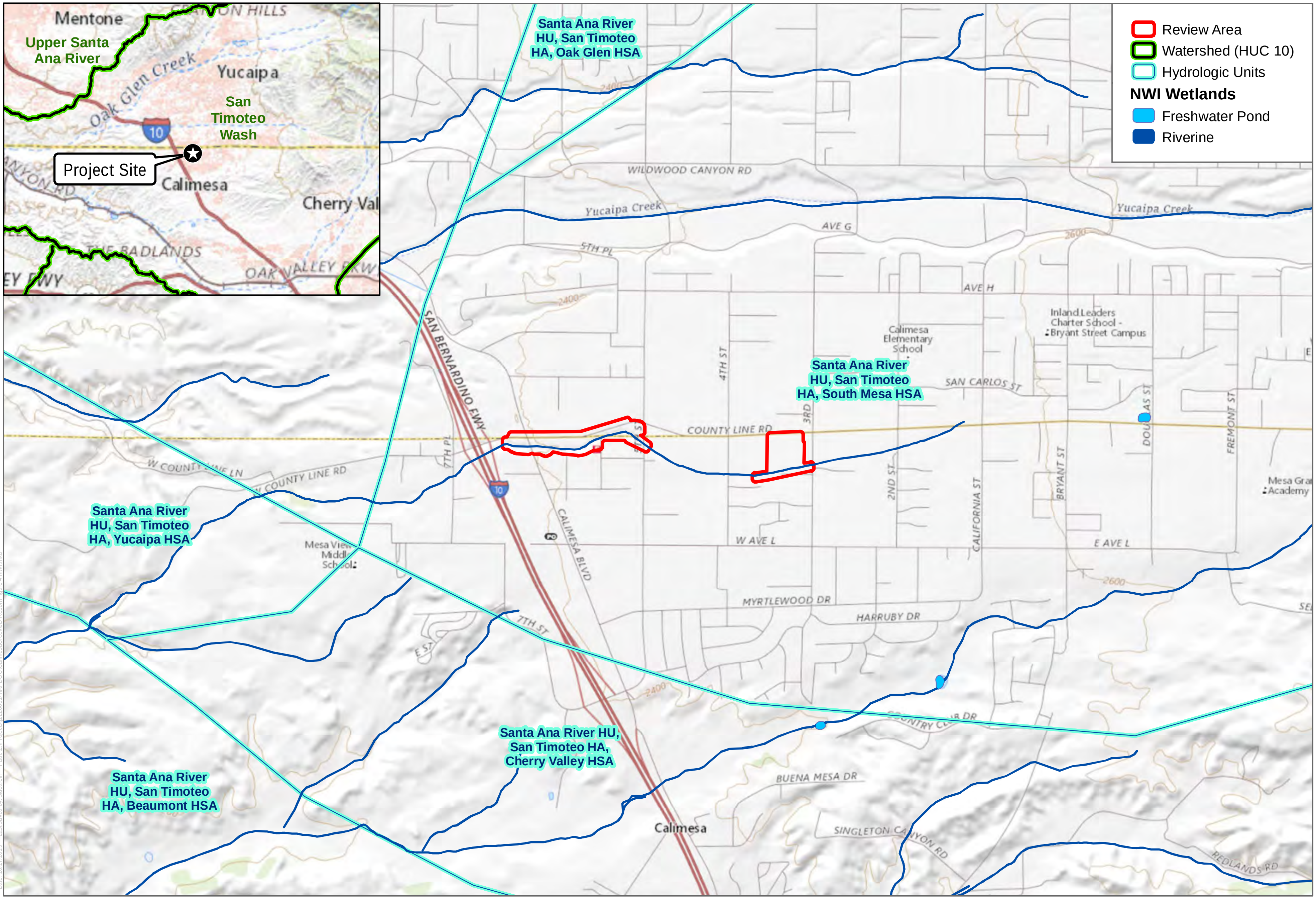
DigitalGlobe 2018
NAD83 California Zone VI US Foot

DUDEK

FIGURE 3b

Aquatic Resource Delineation Map

Calimesa Creek Project - Calimesa, California - 10/30/2020



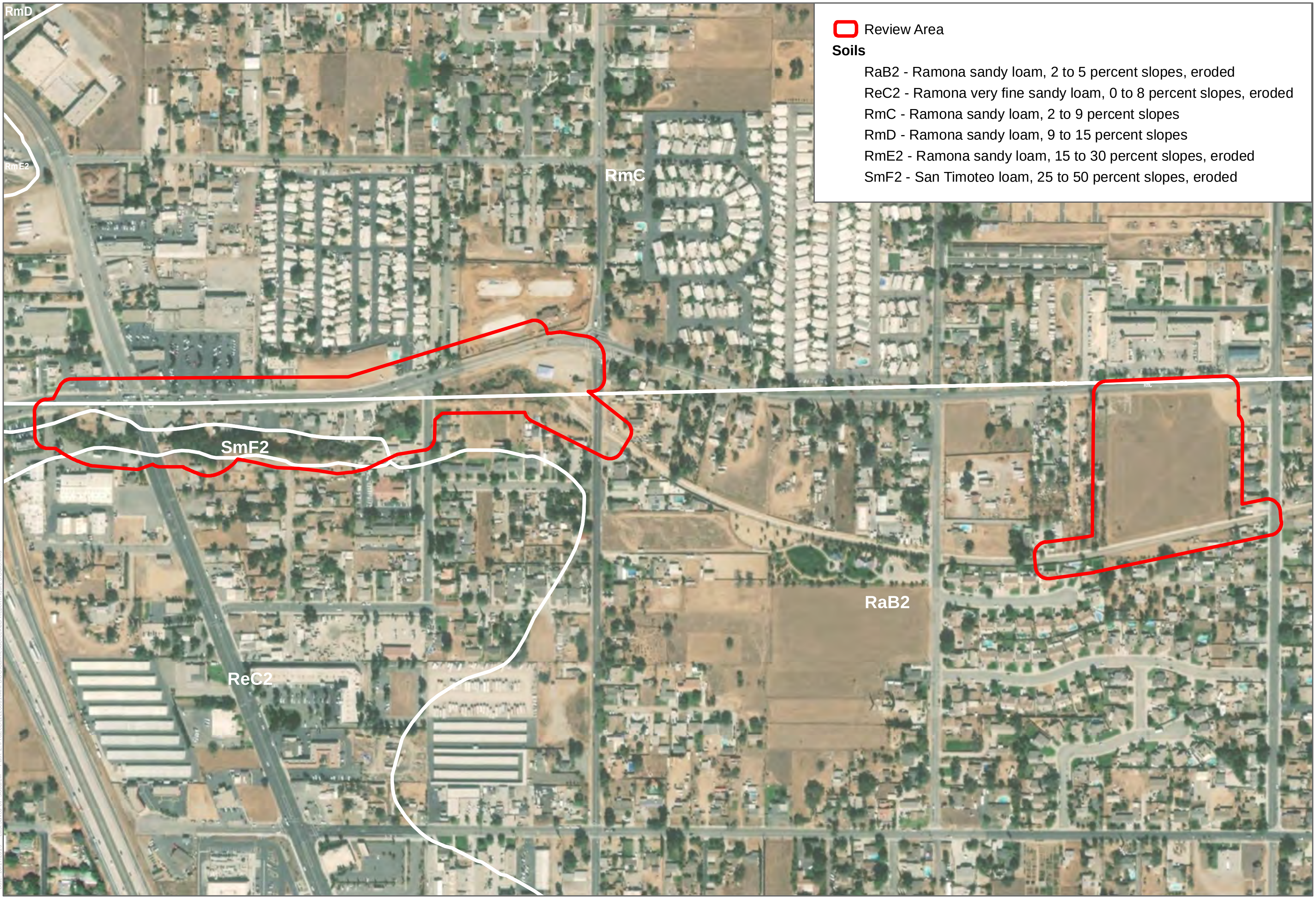
USGS National Map 2019; USFWS Nation Wetlands Inventory
USGS National Hydrography Dataset; CA Dept of Water Resources
NAD83 California Zone VI US Foot

1 inch = 0.38 miles

0 0.225 0.45 Miles

DUDEK

FIGURE 4
National Wetlands Inventory and Hydrologic Unit Map
Calimesa Creek Project - Calimesa, California - 10/17/2019

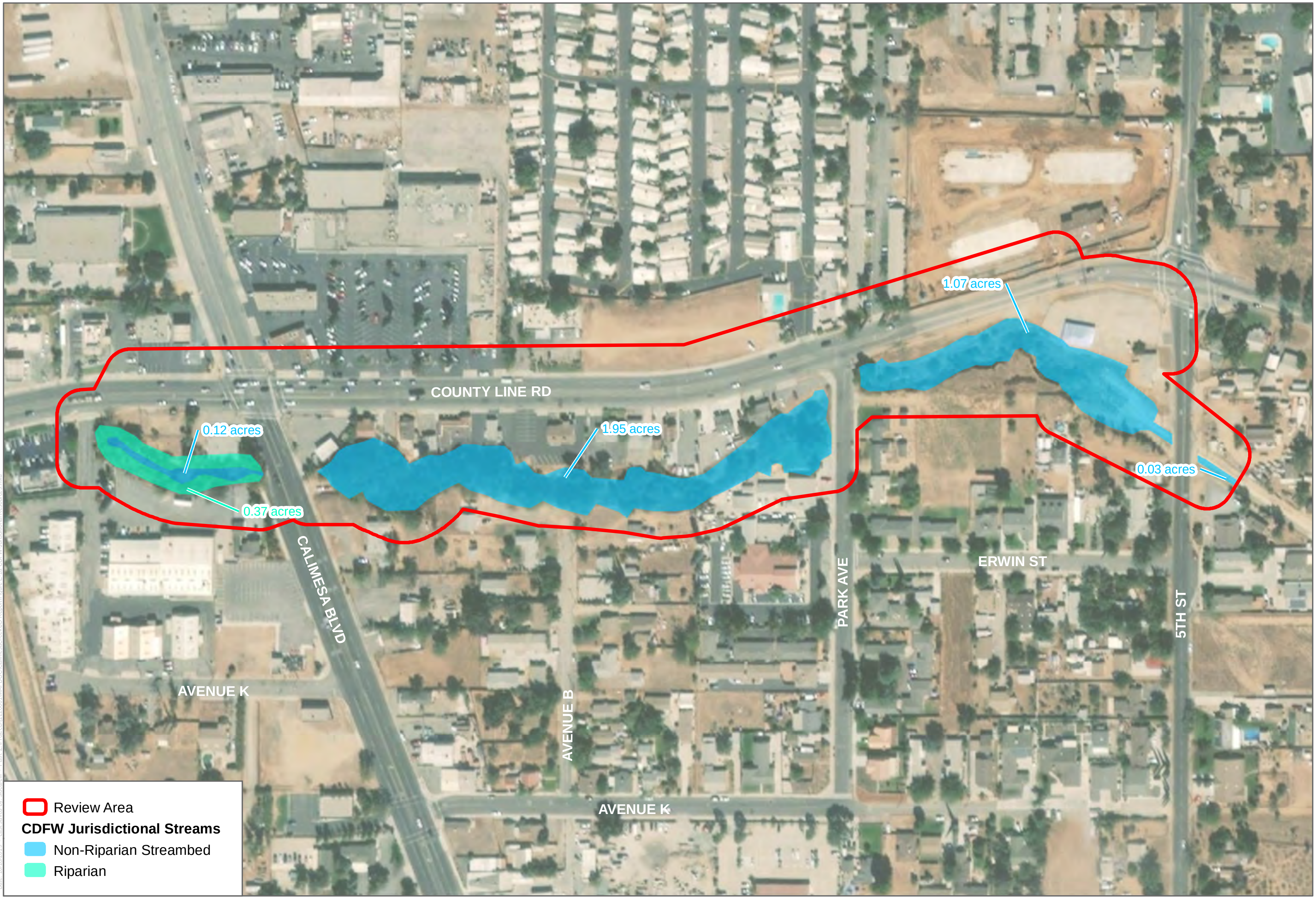


USGS National Map 2019
USGS NRCS
NAD83 California Zone VI US Foot

DUDEK

1 inch = 500 feet
0 250 500 Feet

FIGURE 5
NRCS Soils Map
Calimesa Creek Project - Calimesa, California - 10/17/2019



DigitalGlobe 2018
NAD83 California Zone VI US Foot

1 inch = 250 feet
0 125 250 Feet

FIGURE E-1a
CDFW-Jurisdictional Resources
Calimesa Creek Project - Calimesa, California - 10/18/2019

DigitalGlobe 2018
NAD83 California Zone VI US Foot

DUDEK

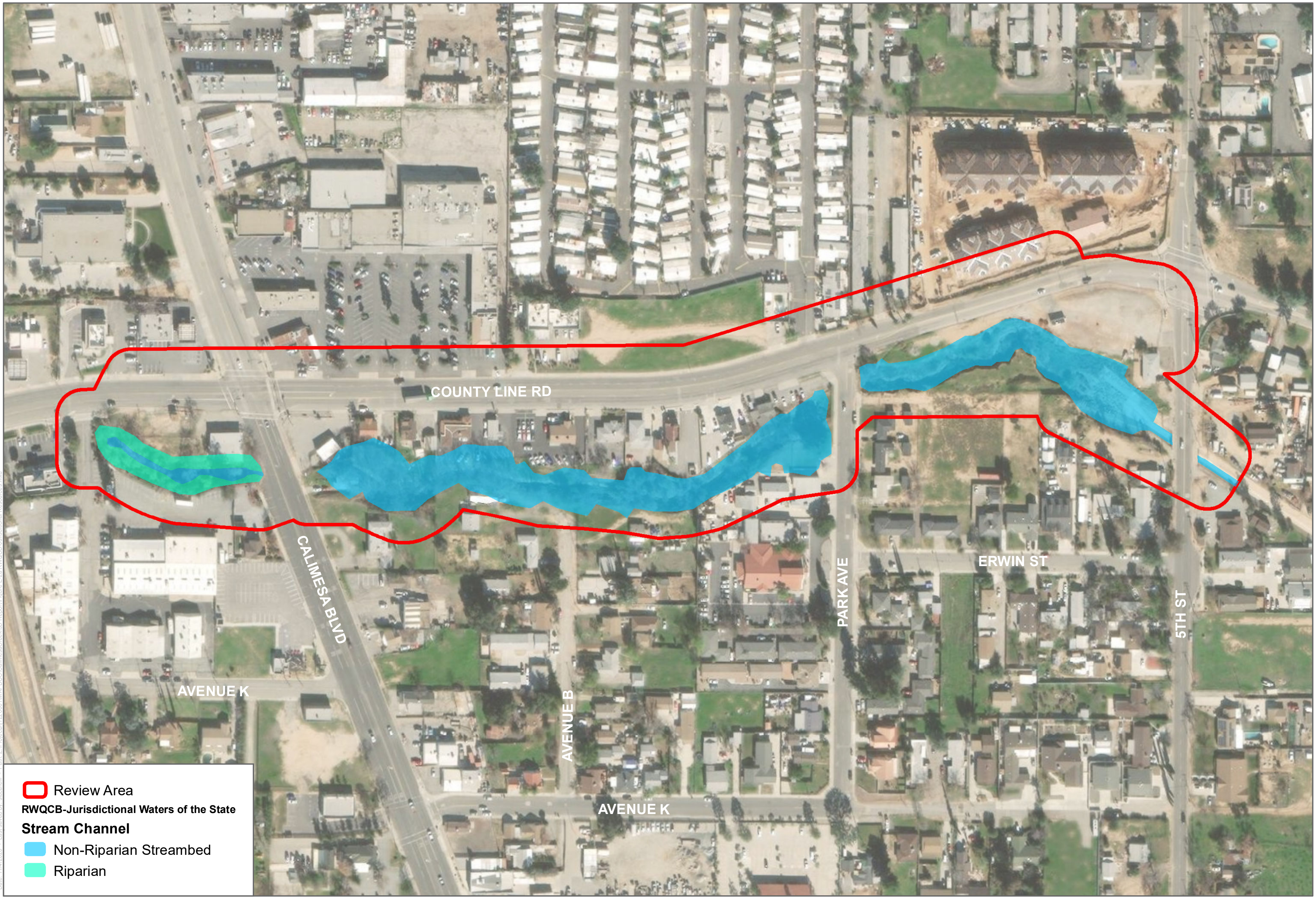
1 inch = 250 feet

0 125 250 Feet

FIGURE E-1b

CDFW-Jurisdictional Resources

Calimesa Creek Project - Calimesa, California - 10/18/2019



DigitalGlobe 2018
NAD83 California Zone VI US Foot

DUDEK

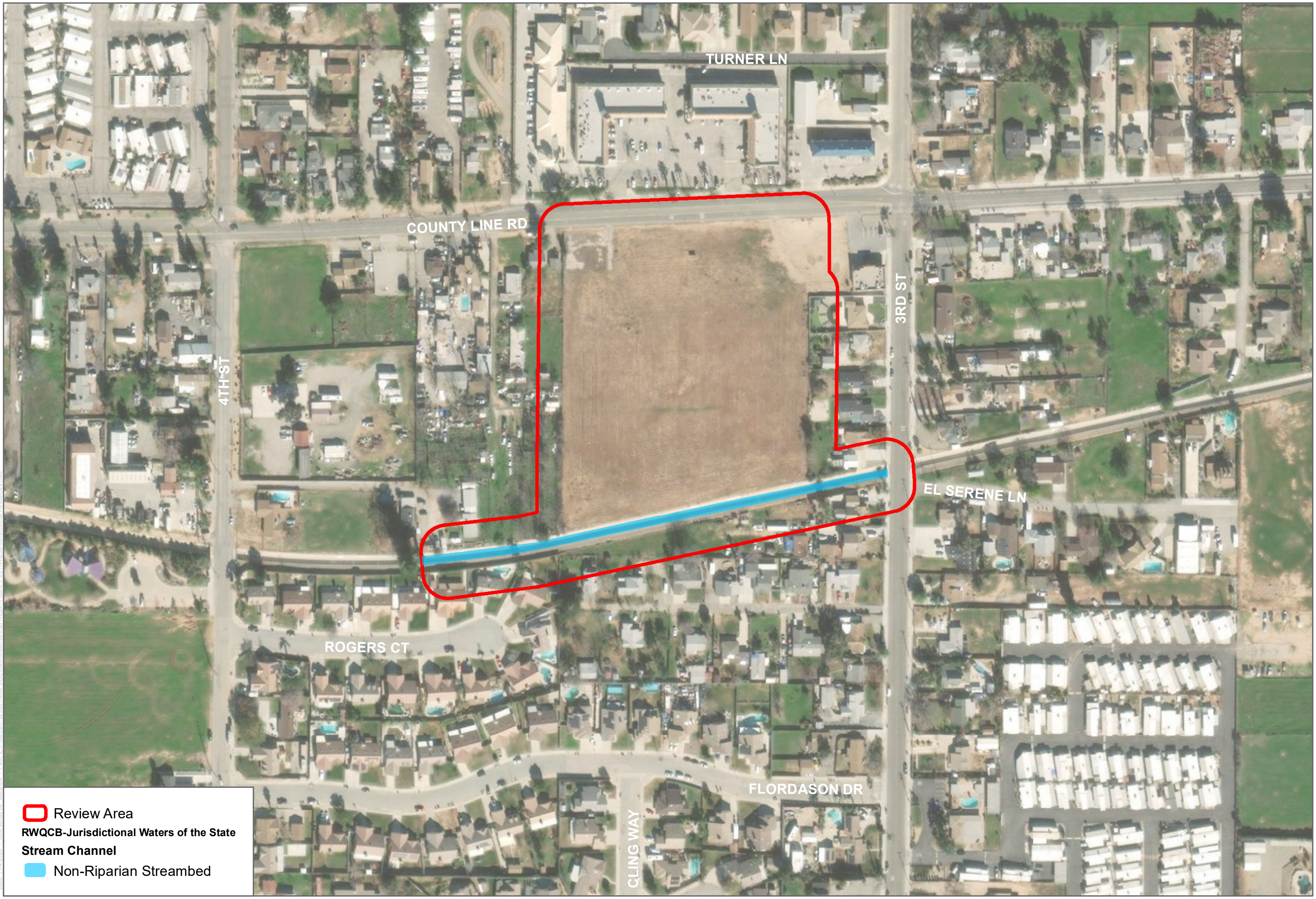
1 inch = 250 feet

0 125 250 Feet

FIGURE E-2a

RWQCB-Jurisdictional Resources

Calimesa Creek Project - Calimesa, California - 11/4/2020



DigitalGlobe 2018
NAD83 California Zone VI US Foot

DUDEK

1 inch = 250 feet

0 125 250 Feet

FIGURE E-2b

RWQCB-Jurisdictional Resources

Calimesa Creek Project - Calimesa, California - 11/4/2020

Appendix C

Wetland Determination Data Forms and Ordinary High Water Mark Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Calimesa Creek III City/County: Calimesa/Riverside Sampling Date: 09/20/19

Applicant/Owner: State: CA Sampling Point: WPD-1

Investigator(s): B. Strittmater Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: Long: Datum: WGS 1984

Soil Map Unit Name: Ramona Sandy Loam, 2% to 5% slopes NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks: Data station taken within streambed terrace

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Arundo donax*	50	Yes	FACW
2. *Xanthium strumarium*	3	No	FAC
3. *Datura wrightii*	1	No	UPL
4. *Hirschfeldia incana*	5	No	UPL
5.			
6.			
7.			
8.			
Total Cover:	59 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 30 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	50	x 2 =	100
FAC species	3	x 3 =	9
FACU species		x 4 =	0
UPL species	6	x 5 =	30
Column Totals:	59 (A)		139 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: WPD-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10"	2.5Y 3/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Pit collapses at ~4" due to sandy soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☒ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ODP-1

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Calimesa Creek Stage III **Project Number:** 12200 **Stream:** Calimesa Creek **Investigator(s):** B. Strittmater	**Date:** 09/20/19 **Town:** Calimesa **Photo begin file#:** 11	**Time:** **State:** CA **Photo end file#:** 11
Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☐ / N ☒ Is the site significantly disturbed?	**Location Details:** East of 4th St. & West of 3rd St. **Projection:** **Datum:** **Coordinates:**	

Potential anthropogenic influences on the channel system:

Adjacent development

Brief site description:

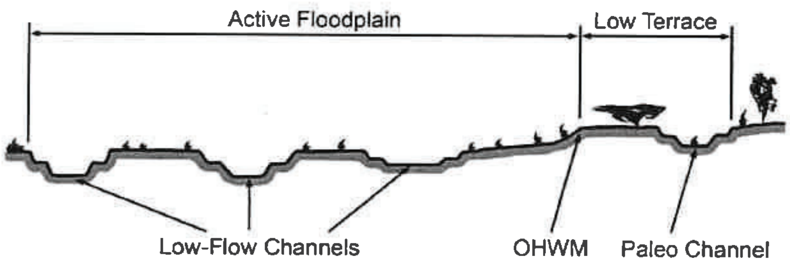
At this location, Calimesa Creek is a concrete trapezoidal channel with flows being conveyed to the west. Mix of residential, and vacant lots to north and south, 3rd St. to east, and 4th St. to west.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



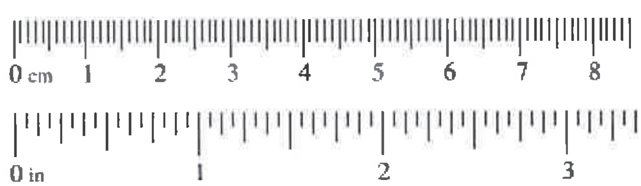
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

ODP-1

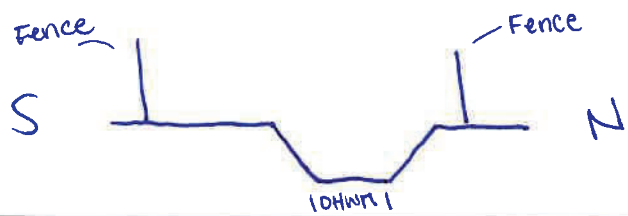
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: Calimesa **Cross section ID:** ODP-1 **Date:** 09/20/19 **Time:**

Cross section drawing:



OHWM

GPS point: OHWM – 1

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Concrete-lined trapezoidal channel, flows west

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: OHWM – 1

Characteristics of the floodplain unit:

Average sediment texture: Concrete-lined channel

Total veg cover: ∅ % Tree: – % Shrub: – % Herb: – %

Community successional stage:

- ☒ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________
- ☐ Other: ____________
- ☐ Other: ____________

Comments:

Project ID: **Cross section ID:** ODP-1 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA

☐ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☐ Benches

☐ Soil development

☐ Surface relief

☐ Other: ____________

☐ Other: ____________

☐ Other: ____________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

☐ NA

☐ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☐ Benches

☐ Soil development

☐ Surface relief

☐ Other: ____________

☐ Other: ____________

☐ Other: ____________

Comments:

ODP-2

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Calimesa Creek Stage III **Project Number:** 12200 **Stream:** Calimesa Creek **Investigator(s):** B. Strittmater	**Date:** 09/20/19 **Time:** **Town:** Calimesa **State:** CA **Photo begin file#:** 25 **Photo end file#:** 25
Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☒ / N ☐ Is the site significantly disturbed?	**Location Details:** East of Park Ave and west of 5th St. **Projection:** **Datum:** **Coordinates:**

Potential anthropogenic influences on the channel system:
Adjacent development / erosion, trash / litter, homeless encampments

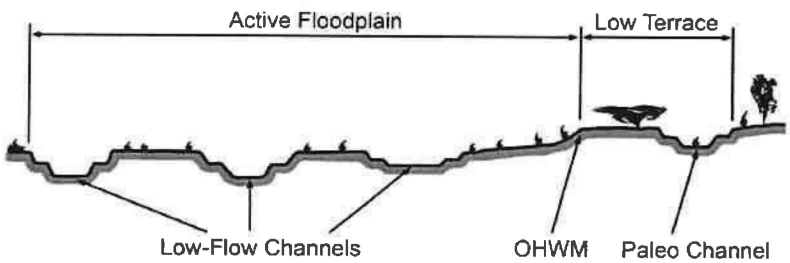
Brief site description:
Ephemeral sandy bottom channel w/ a mix of ornamental and native species along terraces.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



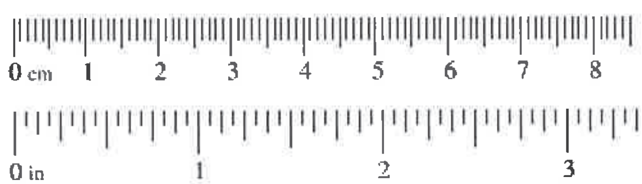
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

ODP-2

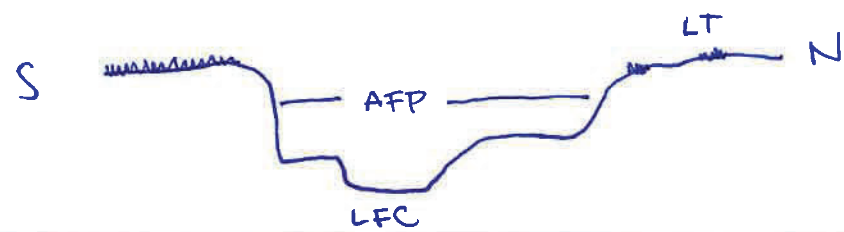
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: Calimesa **Cross section ID:** ODP-2 **Date:** 09/20/19 **Time:**

Cross section drawing:



OHWM

GPS point: OHWM-2

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ______
- [ ] Other: ______

Comments:

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: OHWM_2

Characteristics of the floodplain unit:

Average sediment texture: Fine sand

Total veg cover: 3 % Tree: ∅ % Shrub: ∅ % Herb: 3 %

Community successional stage:

- [ ] NA
- [x] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [x] Other: Sediment deposition
- [ ] Other: ______
- [ ] Other: ______

Comments:

mainly unvegetated, sandy bottom channel w/ sediment deposition, debris wracking, shelving

Project ID: Calimesa **Cross section ID:** ODP-2 **Date:** 09/20/19 **Time:**

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: OHWM-2

Characteristics of the floodplain unit:

Average sediment texture: very coarse sand

Total veg cover: 70 % Tree: 15 % Shrub: 10 % Herb: 45 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☒ Benches
- ☐ Soil development
- ☒ Surface relief
- ☐ Other: ____
- ☐ Other: ____
- ☐ Other: ____

Comments:

mix of upland species (i.e, non-native grasses) and some trees (i.e., Eucalyptus, scattered mulefat, black walnut, tree of heaven, etc.)

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: OHWM-2

Characteristics of the floodplain unit:

Average sediment texture: ____

Total veg cover: 10 % Tree: ∅ % Shrub: ∅ % Herb: 10 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____
- ☐ Other: ____
- ☐ Other: ____

Comments:

Disturbed habitat w/ sparse cover of non-native grass (Bromes), County Line Road immediately North.

ODP-3

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Calimesa Creek Stage III
Project Number: 12200
Stream: Calimesa Creek
Investigator(s): B. Strittmater

Date: 09/20/19
Town: Calimesa
Photo begin file#: 27

Time:
State: CA
Photo end file#: 27

Y [x] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [x] Is the site significantly disturbed?

Location Details: East of Calimesa Blvd; West of Park Ave

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

Adjacent development, some trash/litter, homeless

Brief site description:

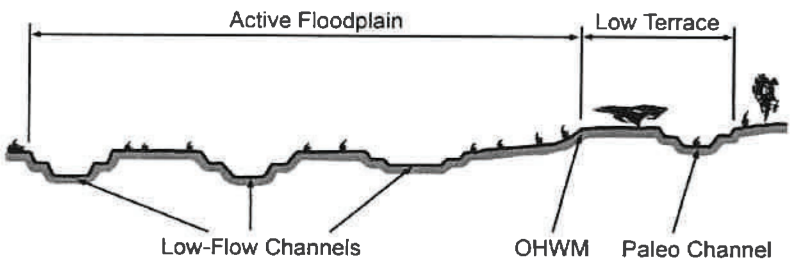
Ephemeral sandy bottom channel (unvegetated) with Black locust and Tree of heaven along banks w/ non-native grasses and forbs in understory. Few scattered oaks present.

Checklist of resources (if available):

- [x] Aerial photography
  Dates:
- [x] Topographic maps
- [ ] Geologic maps
- [x] Vegetation maps
- [x] Soils maps
- [ ] Rainfall/precipitation maps
- [x] Existing delineation(s) for site
- [x] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



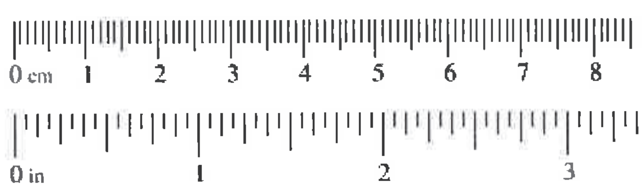
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [x] Digitized on computer
   - [x] GPS
   - [ ] Other:

ODP-3

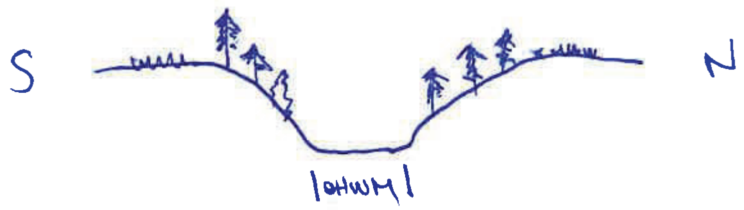
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: Calimesa **Cross section ID:** ODP-3 **Date:** 09/20/19 **Time:**

Cross section drawing:



OHWM

GPS point: OHWM - 3

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ______
- [ ] Other: ______

Comments:
unvegetated channel, sandy bottom. Tree of heaven, black locust dominate slopes w/ bromes and forbs (WCFOE). Few scattered oaks present as well.

Floodplain unit: [x] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: OHWM - 3

Characteristics of the floodplain unit:

Average sediment texture: Fine sand

Total veg cover: Ø % Tree: – % Shrub: – % Herb: – %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ______
- [ ] Other: ______
- [ ] Other: ______

Comments:
unvegetated sandy bottom channel w/ break in bank / shelving.

Project ID: **Cross section ID:** ODP-3 **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks ☐ Soil development

☐ Ripples ☐ Surface relief

☐ Drift and/or debris ☐ Other: ______________

☐ Presence of bed and bank ☐ Other: ______________

☐ Benches ☐ Other: ______________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ______________________

Characteristics of the floodplain unit:

Average sediment texture: ______________

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)

☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

☐ Mudcracks ☐ Soil development

☐ Ripples ☐ Surface relief

☐ Drift and/or debris ☐ Other: ______________

☐ Presence of bed and bank ☐ Other: ______________

☐ Benches ☐ Other: ______________

Comments:

ODP-4

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Calimesa Creek Stage III **Project Number:** 12200 **Stream:** Calimesa Creek **Investigator(s):** B. Strittmater	**Date:** 09/20/19 **Time:** **Town:** Calimesa **State:** CA **Photo begin file#:** 28 **Photo end file#:** 32
Y ☒ / N ☐ Do normal circumstances exist on the site? Y ☐ / N ☒ Is the site significantly disturbed?	**Location Details:** East of I-10 FWY, West of Calimesa Blvd. **Projection:** **Datum:** **Coordinates:**

Potential anthropogenic influences on the channel system:

Adjacent development, some trash/litter, homeless

Brief site description:

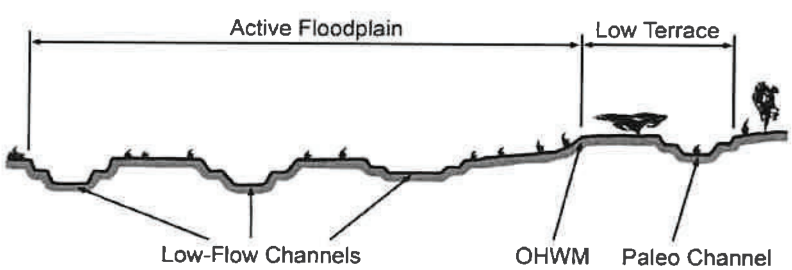
unvegetated ephemeral sandy bottom channel w/ Fremont cottonwood, oak, and ~~eca~~ eucalyptus/tree of heaven along slopes. understory mainly leaf litter.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



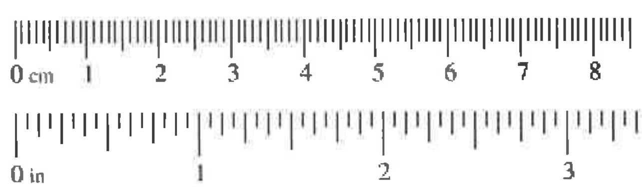
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

ODP-4

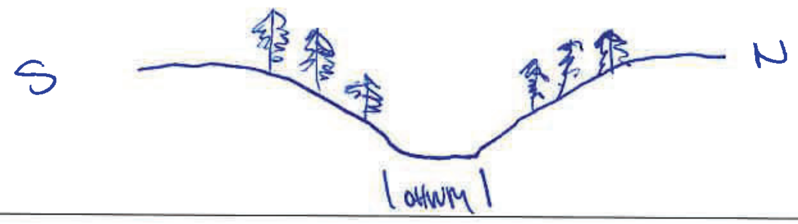
Wentworth Size Classes

Inches (in)		Millimeters (mm)	Wentworth size class	
			Boulder	Gravel
	10.08	256		
			Cobble	
	2.56	64		
			Pebble	
	0.157	4		
			Granule	
	0.079	2.00		
			Very coarse sand	Sand
	0.039	1.00		
			Coarse sand	
	0.020	0.50		
			Medium sand	
1/2	0.0098	0.25		
			Fine sand	
1/4	0.005	0.125		
			Very fine sand	
1/8	0.0025	0.0625		
			Coarse silt	Silt
1/16	0.0012	0.031		
			Medium silt	
1/32	0.00061	0.0156		
			Fine silt	
1/64	0.00031	0.0078		
			Very fine silt	
1/128	0.00015	0.0039		
			Clay	Mud



Project ID: Calimesa **Cross section ID:** ODP-4 **Date:** 09/20/19 **Time:**

Cross section drawing:



OHWM

GPS point: OHWM-4

Indicators:

- [x] Change in average sediment texture
- [x] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

unvegetated sandy bottom channel w/ Fremont cottonwood, coast live oak, tree of heaven and Eucalyptus along slopes

Floodplain unit:

- [x] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: OHWM-4

Characteristics of the floodplain unit:

Average sediment texture: Fine Sand

Total veg cover: 0 % Tree: — % Shrub: — % Herb: — %

Community successional stage:

- [x] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: ____________
- [ ] Other: ____________
- [ ] Other: ____________

Comments:

This portion of Calimesa Creek contains high amount of leaf litter in channel

ODP-4

Project ID: **Cross section ID:** **Date:** **Time:**

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: ____________________

Characteristics of the floodplain unit:

Average sediment texture: ____________________

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: ____________________
- ☐ Other: ____________________
- ☐ Other: ____________________

Comments:

Appendix D

California Department of Fish and Wildlife and Regional Water Quality Control Board Jurisdictional Resources

Methods

Dudek Biologist Britney Strittmater conducted a delineation of jurisdictional waters of the United States and state within the review area on September 20, 2019. Table 1 summarizes the site conditions and timing of the survey. An aquatics resources delineation report was prepared for the review area and waters of the United States, including wetlands, that are under the jurisdiction of the U.S. Army Corps of Engineers (ACOE) are addressed in the *Calimesa Creek Stage III Project Aquatics Resources Delineation Report* (Dudek 2019). Maps are included in Appendix B of the *Calimesa Creek Stage III Project Aquatics Resources Delineation Report* (Dudek 2019), including the project location (Figure 1), U.S. Geological Survey topographic map (Figure 2), National Wetland Inventory, Hydrological Unit, and National Hydrography Data (Figure 4), and soils map (Figure 5).

Table 1. Schedule of the Jurisdictional Delineation Conducted for the Calimesa Creek Stage III Project

Date	Hours	Personnel	Conditions
September 20, 2019	9:45 a.m. to 2:45 p.m.	Britney Strittmater	no cloud cover; wind speeds from 1 to 3 mph; and temperatures ranging from 65°F to 79°F

Jurisdictional boundaries were mapped in the field using a Trimble GeoXT GPS with submeter accuracy and aerial imagery from Digital Globe dated 2018. Following the field work, Britney Strittmater digitized the resources using ArcGIS and project-specific 1-foot contour topography.

The jurisdiction-specific methods used to delineate California Department of Fish and Wildlife (CDFW) and Regional Water Quality Control Board (RWQCB) jurisdiction are described below.

CDFW Jurisdiction Methods

The delineation defined areas under the jurisdiction of the CDFW pursuant to Sections 1600–1603 of the California Fish and Game Code. A predominance of hydrophytic vegetation, where associated with a stream channel, was used to determine CDFW-regulated riparian areas. Streambeds under the jurisdiction of CDFW were delineated using the Cowardin method of waters classification, which defines waters boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).

RWQCB Jurisdiction Methods

Areas regulated by the RWQCB are generally coincident with the ACOE, but can also include the adjacent riparian zone. Therefore, for this project, the RWQCB jurisdiction and CDFW jurisdiction are coincident.

Results

There are 3.1 acres of RWQCB- and CDFW-jurisdictional resources in the review area along Calimesa Creek (Table 2). Of that 3.1 acres, 2.7 acres are non-riparian streambed and 0.4 acres are riparian. Within the non-riparian areas, there is unvegetated channel and non-hydrophytic vegetation. Within the riparian areas, there is Fremont cottonwood. Figures E-1a and Figure E-1b show the CDFW-jurisdictional areas. Figures E-2a and Figure E-2b show the RWQCB-jurisdictional areas. Each vegetation community is described below.

Table 2. California Department of Fish and Wildlife and Regional Water Quality Control Board Jurisdictional Resources

Resources Type	Vegetation Community	Grand Total
Non-Riparian Streambed	Eucalyptus/Tree of Heaven/Black Locust Groves	1.6
	Unvegetated Channel	1.1
	Non-Riparian Streambed Total	*2.7*
Riparian	Fremont cottonwood (*Populus fremontii*) Alliance	0.4
	Riparian Total	*0.4*
Grand Total		**3.1**

Notes: CDFW = California Department of Fish and Wildlife; RWQCB = Regional Water Quality Control Board.

Eucalyptus/Tree of Heaven/Black Locust Groves Semi-Natural Stands

The eucalyptus/tree of heaven/black locust grove semi-natural stand is dominated by eucalyptus (*Eucalyptus* spp.), tree of heaven (*Ailanthus altissima*), or black locust (*Robinia pseudoacacia*) in the tree canopy, forming an open-to-continuous tree layer less than 60 meters tall with a sparse to intermittent shrub and herbaceous layer (Sawyer et al 2009).

Within the review area, this semi-natural stand occurs along the banks of Calimesa Creek within the western portion of the review area and is co-dominated by tree of heaven and black locust with a few scattered eucalyptus trees present. Scattered giant reed (*Arundo donax*), mule fat (*Baccharis salicifolia*), coast live oak (*Quercus agrifolia*), and Fremont cottonwood (*Populus fremontii*) were present, but were not dominant. This area contained a moderate amount of trash, debris, and litter resulting from homeless encampments and adjacent residential and commercial developments.

Fremont Cottonwood Forest Alliance

Fremont cottonwood forest alliance is dominated or co-dominated by Fremont cottonwood with a continuous to open tree canopy less than 25 meters tall. The shrub layer is intermittent to open and the herbaceous layer is variable (Sawyer et al. 2009). This community is found rivers, streams, lower canyons, alluvial fans, and valleys with a subsurface water supply that varies throughout the year (Sawyer et al. 2009).

Fremont cottonwood forest occurs along the downstream banks of Calimesa Creek within the western portion of the study area. This vegetation community contains greater than 5% absolute cover of Fremont cottonwood warranting a community; however, this community does include a high cover of tree of heaven. Scattered emergent coast live oaks and eucalyptus are present at lower covers. The understory is sparse and includes non-native grasses, including brome species (*Bromus* spp.).

Unvegetated Channel

Within the review area, unvegetated channel includes a concrete-lined trapezoidal channel containing Calimesa Creek. The downstream portion of Calimesa Creek, west of 5th Street, includes a sandy bottom earthen-lined channel that is subject to frequent scouring associated with annual storm events. While the unvegetated channel within the review area was composed primarily of bare ground and a sandy substrate, a low percent cover of plant species were observed in the review area within this land cover type include sacred thorn-apple (*Datura wrightii*), and bromes (*Bromus* spp.).

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Appendix E

WETS Table

Yucaipa Station, 4.1 SE (note: August 2019 data was not available for this station)								
Date	**Max Temperature**	**Min Temperature**	**Avg Temperature**	**GDD Base 40**	**GDD Base 50**	**Precipitation**	**Snowfall**	**Snow Depth**
2019-06-01	M	M	M	M	M	M	M	M
2019-06-02	M	M	M	M	M	M	M	M
2019-06-03	M	M	M	M	M	M	M	M
2019-06-04	M	M	M	M	M	M	M	M
2019-06-05	M	M	M	M	M	M	M	M
2019-06-06	M	M	M	M	M	M	M	M
2019-06-07	M	M	M	M	M	M	M	M
2019-06-08	M	M	M	M	M	M	M	M
2019-06-09	M	M	M	M	M	M	M	M
2019-06-10	M	M	M	M	M	M	M	M
2019-06-11	M	M	M	M	M	M	M	M
2019-06-12	M	M	M	M	M	M	M	M
2019-06-13	M	M	M	M	M	M	M	M
2019-06-14	M	M	M	M	M	M	M	M
2019-06-15	M	M	M	M	M	M	M	M
2019-06-16	M	M	M	M	M	M	M	M
2019-06-17	M	M	M	M	M	M	M	M
2019-06-18	M	M	M	M	M	M	M	M
2019-06-19	M	M	M	M	M	M	M	M
2019-06-20	M	M	M	M	M	M	M	M
2019-06-21	M	M	M	M	M	0.05	M	M
2019-06-22	M	M	M	M	M	0.02	M	M
2019-06-23	M	M	M	M	M	M	M	M
2019-06-24	M	M	M	M	M	M	M	M
2019-06-25	M	M	M	M	M	M	M	M
2019-06-26	M	M	M	M	M	M	M	M
2019-06-27	M	M	M	M	M	M	M	M
2019-06-28	M	M	M	M	M	M	M	M
2019-06-29	M	M	M	M	M	M	M	M
2019-06-30	M	M	M	M	M	M	M	M
Average|Sum	**M**	**M**	**M**	**M**	**M**	**0.07**	**M**	**M**

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-07-01	M	M	M	M	M	M	M	M
2019-07-02	M	M	M	M	M	M	M	M
2019-07-03	M	M	M	M	M	M	M	M
2019-07-04	M	M	M	M	M	M	M	M
2019-07-05	M	M	M	M	M	M	M	M
2019-07-06	M	M	M	M	M	M	M	M
2019-07-07	M	M	M	M	M	M	M	M
2019-07-08	M	M	M	M	M	M	M	M
2019-07-09	M	M	M	M	M	M	M	M
2019-07-10	M	M	M	M	M	M	M	M
2019-07-11	M	M	M	M	M	M	M	M
2019-07-12	M	M	M	M	M	M	M	M
2019-07-13	M	M	M	M	M	M	M	M
2019-07-14	M	M	M	M	M	M	M	M
2019-07-15	M	M	M	M	M	M	M	M
2019-07-16	M	M	M	M	M	M	M	M
2019-07-17	M	M	M	M	M	M	M	M
2019-07-18	M	M	M	M	M	M	M	M
2019-07-19	M	M	M	M	M	M	M	M
2019-07-20	M	M	M	M	M	M	M	M
2019-07-21	M	M	M	M	M	M	M	M
2019-07-22	M	M	M	M	M	M	M	M
2019-07-23	M	M	M	M	M	T	M	M
2019-07-24	M	M	M	M	M	0.23	M	M
2019-07-25	M	M	M	M	M	M	M	M
2019-07-26	M	M	M	M	M	M	M	M
2019-07-27	M	M	M	M	M	M	M	M
2019-07-28	M	M	M	M	M	M	M	M
2019-07-29	M	M	M	M	M	M	M	M
2019-07-30	M	M	M	M	M	M	M	M
2019-07-31	M	M	M	M	M	M	M	M
Average|Sum	**M**	**M**	**M**	**M**	**M**	**0.23**	**M**	**M**

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2019-09-01	M	M	M	M	M	M	M	M
2019-09-02	M	M	M	M	M	M	M	M
2019-09-03	M	M	M	M	M	M	M	M
2019-09-04	M	M	M	M	M	M	M	M
2019-09-05	M	M	M	M	M	M	M	M
2019-09-06	M	M	M	M	M	M	M	M
2019-09-07	M	M	M	M	M	M	M	M
2019-09-08	M	M	M	M	M	M	M	M
2019-09-09	M	M	M	M	M	M	M	M
2019-09-10	M	M	M	M	M	M	M	M
2019-09-11	M	M	M	M	M	M	M	M
2019-09-12	M	M	M	M	M	M	M	M
2019-09-13	M	M	M	M	M	M	M	M
2019-09-14	M	M	M	M	M	M	M	M
2019-09-15	M	M	M	M	M	M	M	M
2019-09-16	M	M	M	M	M	M	M	M
2019-09-17	M	M	M	M	M	M	M	M
2019-09-18	M	M	M	M	M	M	M	M
2019-09-19	M	M	M	M	M	M	M	M
2019-09-20	M	M	M	M	M	M	M	M
2019-09-21	M	M	M	M	M	M	M	M
2019-09-22	M	M	M	M	M	M	M	M
2019-09-23	M	M	M	M	M	M	M	M
2019-09-24	M	M	M	M	M	M	M	M
2019-09-25	M	M	M	M	M	M	M	M
2019-09-26	M	M	M	M	M	0.01	M	M
2019-09-27	M	M	M	M	M	0.13	M	M
2019-09-28	M	M	M	M	M	M	M	M
2019-09-29	M	M	M	M	M	M	M	M
2019-09-30	M	M	M	M	M	M	M	M
Average|Sum	**M**	**M**	**M**	**M**	**M**	**0.14**	**M**	**M**

Appendix F

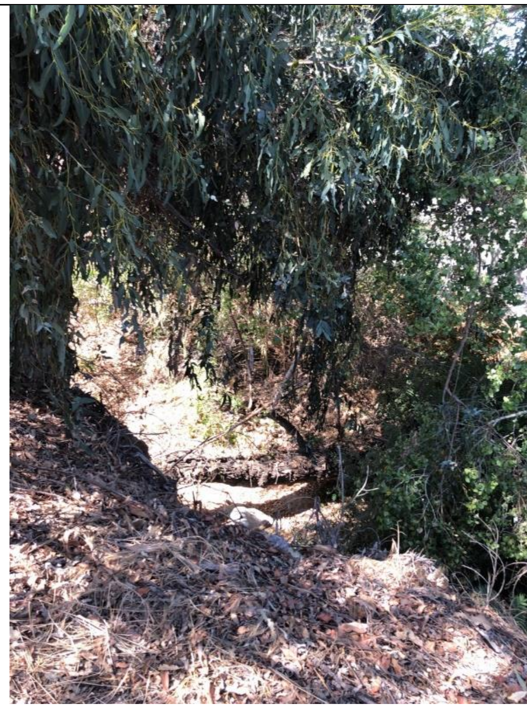
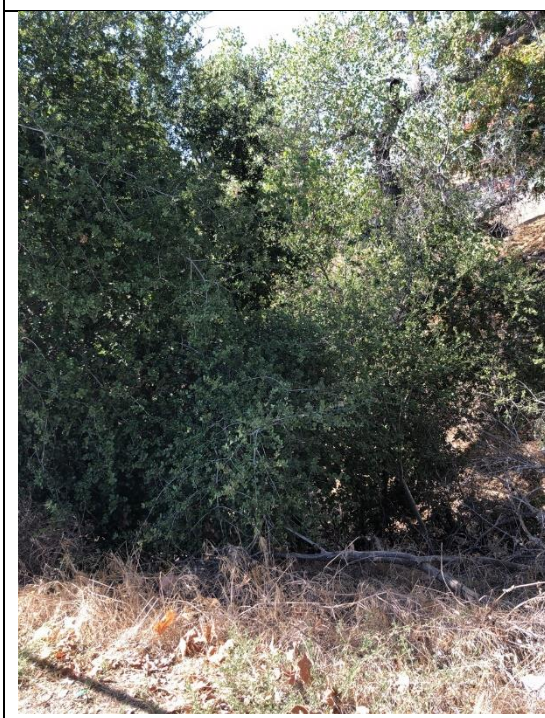
Representative Photographs

	
PP-1: Downstream, west-facing view of trapezoidal channel near OWHM data point (ODP)-1	PP-2: Upstream, east-facing view of trapezoidal channel
	
PP-3: Upstream, east-facing view of trapezoidal channel	PP-4: Downstream, west-facing view of trapezoidal channel

	
PP-5: Upstream, east-facing of non-wetland waters of the United States	PP-5: Downstream, west-facing view of non-wetlands waters of the United States
	
PP-6: South-facing view of non-wetlands waters of the United States	PP-7: Upstream, east-facing of non-wetland waters of the United States

	
PP-8: Downstream, west-facing view of non-wetlands waters of the United States	PP-9: Downstream, west-facing view of non-wetlands waters of the United States
	
PP-10: Upstream, east-facing of non-wetland waters of the United States	PP-11: Upstream, east-facing of non-wetland waters of the United States

	
PP-11: Downstream, west-facing view of non-wetlands waters of the United States near ODP-2	PP-12: Upstream, east-facing of non-wetland waters of the United States near WDP-1
	
PP-13: South-facing of non-wetland waters of the United States near ODP-3	PP-14: Upstream, east-facing of non-wetland waters of the United States

	
PP-15: North-facing view of non-wetlands waters of the United States near ODP-4	PP-16: Downstream, west-facing view of non-wetlands waters of the United States
	
PP-17: Downstream, west-facing view of non-wetlands waters of the United States	

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Appendix C – Cultural Resource Assessment

UPDATED CULTURAL RESOURCES ASSESSMENT OF THE CALIMESA CHANNEL, STAGE 3 PROJECT, CITY OF CALIMESA, RIVERSIDE COUNTY, CALIFORNIA

by

Robert S. White
Laura S. White M.A. †
Richard Guttenberg, M.A.

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for

Phil Martin & Associates
1809 E. Dyer Road
Suite 301
Santa Ana, CA 92705

UPDATED
November, 2019

USGS 7.5' Topographic Quadrangle: *Yucaipa*

Study Area Acreage: 8±acres
Sections 13 and 14, Township 2 South, Range 2 West, SBBM

KEYWORDS: Survey, Calimesa Creek, City of Calimesa, P33-023900, Riverside County

CERTIFICATION: I hereby certify that the statements furnished herein and in the attached exhibits present data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Robert S. White
Principal Investigator

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MANAGEMENT SUMMARY

At the request of Phil Martin & Associates, Archaeological Associates(AA) has undertaken an updated cultural resources assessment of the Calimesa Channel Stage 3 Project (formally known as the Calimesa Creek Improvement Project undertaken in 2013/2014) in the City of Calimesa, Riverside County. The purpose of the study was to identify all potentially significant cultural resources situated within the limits of the revised undertaking. The project entails:1) the stabilization of approximately 2,100-feet of earthen creek channel by means of a remedial grading program, 2) construct a new subterranean storm within County Line Road between Interstate 10 and 5th Street intended to divert seasonal high flows from entering this section of the creek, 3) abandonment of a small section of the creek situated immediately west of 5th Street and install a low flow diversion pipeline, and 4) the construction of a 4.5 acre retention basin located just southwest of the intersection of County Line Road and 3rd Street.

The results of the records searches conducted at the Eastern Information Center at UC Riverside and the Archaeological Information Center at the San Bernardino County Museum indicated that no prehistoric or historic archaeological sites have been recorded within the limits of the creek alignment. Furthermore, no prehistoric resources of any kind were discovered as a result of a comprehensive field study.

The efforts of the field survey resulted in the discovery of one historic structure. It comprises a concrete storm drain that was constructed in 1930. It lies in the creek bottom on the west side of Calimesa Boulevard just south of County Line Road. A subsequent historical and architectural evaluation of the engineering structure has shown that it does not appear eligible for the National Register of Historic Places or the California Register of Historical Resources. As a matter of course, Department of Parks and Recreation (DPR) 523A (Primary Record) and 523B (Building, Structure, and Object Record) forms were completed for the drain structure (Primary # 33-023900) and submitted to the Eastern Information Center (EIC) at UC Riverside (Appendix E). No additional work in conjunction with cultural resources, including monitoring of any future grading activities, is warranted or recommended.

I. INTRODUCTION

The following report was written for Phil Martin & Associates, Inc. by Archaeological Associates. It describes the results of an updated Cultural Resources Assessment of the Calimesa Channel Stage 3 Project (formally known as the Calimesa Creek Improvement Project). The undertaking is located between 3rd Avenue and Interstate 10, both north and south of County Line Road in the City of Calimesa, Riverside County (fig.1).

Presently, it is desired to: 1) stem the ongoing erosion of approximately 2,100 feet of earthen creek channel between Interstate 10 and 5th Street through a remedial grading program, 2) construct a new subterranean storm within County Line Road between Interstate 10 and 5th Street intended to divert seasonal high flows from entering this section of the creek, 3) abandonment of a small section of the creek situated immediately west of 5th Street and install a low flow diversion pipeline, and 4) the construction of a 4.5 acre retention basin located just southwest of the intersection of County Line Road and 3rd Street. The original plan (2014) to create a hiking trial along the section of Calimesa Creek etween Interstate 10 and 5th Street has been dropped from the project.

The archaeological records searches for the project was conducted by Robert S. White (County Approved Archaeologist #164). The intensive survey of the subject section of creek was conducted by Robert S. White, Laura S. White, M.A, and Susan R. Klein. The field assessment of the proposed retention basin and the low flow diversion was performed by Robert S. White and Richard Guttenberg, M.A. The historic period storm drain adit that lies beneath Calimesa Boulevard just south of County Line Road was evaluated for significance by Robert S. White. Qualification statements are provided in Appendix A.

The purpose of this undertaking was to identify all potentially significant cultural resources situated within the study area. This information is needed since adoption of the improvement plan may result in adverse effects upon locations of archaeological or historical importance. Our assessment consisted of: (1) records searches conducted to determine whether any previously recorded historic or prehistoric material is present within the project footprint, (2) archival research, (3) a field reconnaissance intended to identify any previously unrecorded cultural resources, (4) Native American Scoping, and (5) determinations of historical and architectural significance for the aforementioned storm drain.

The study was conducted in accordance with the National Environmental Policy Act (NEPA) of 1969 which includes criteria for eligibility to the National Register of Historic Places (NRHP)

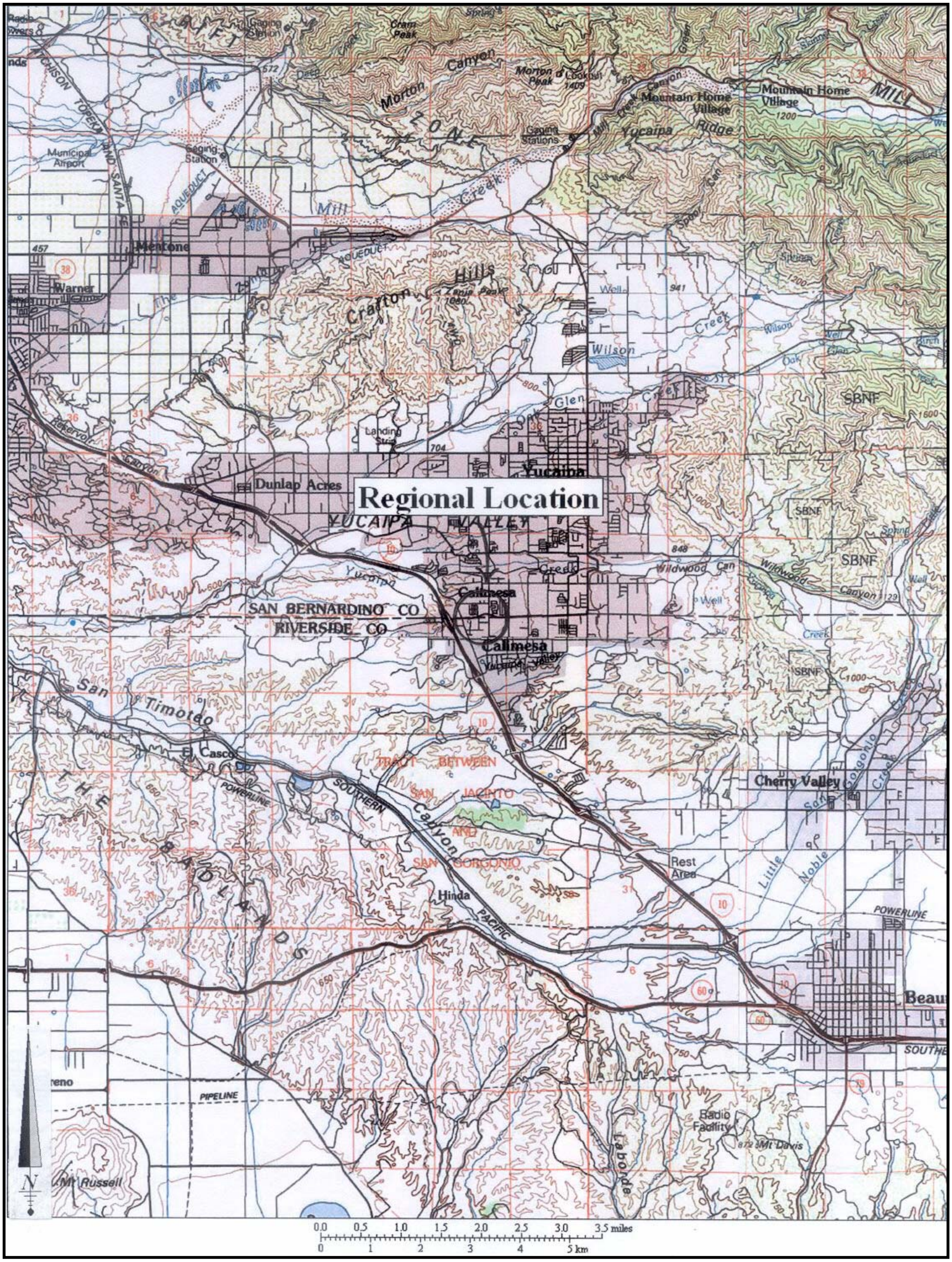

Figure 1. Regional location of the project area as indicated on a portion of the USGS *San Bernardino* 1:100,000 scale Topographic Map (1982).

and the California Environmental Quality Act (CEQA), as amended in 2015, which includes criteria for eligibility to the California Register of Historical Resources (CRHR). This report was prepared according to the *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* contained within the State's Preservation Planning Bulletin Number 4(a) (California Department of Parks and Recreation 1989).

II. SETTING

A. Study Area Location

Regionally, the study area is situated on the western edge of the San Gorgonio Pass approximately 3-miles south of the Crafton Hills. The San Gorgonio Pass is a substantial inland corridor that connects the Coachella Valley to points west. The Pass cities of Beaumont and Banning lie a short distance to the southeast as does the City of Yucaipa to the north. Specifically, the subject section of Calimesa Creek is located in the City of Calimesa from a point just west of 5th Street (terminus of concrete, trapezoidal daylight channel) westward under Park Avenue and Calimesa Boulevard to the point just west of Calimesa Boulevard where the creek enters a large storm drain beneath County Line Road. The 4 ½ acre proposed retention basin is located a short distance to the east just southwest of the intersection of County Line Road and 3rd Street.

The majority of the 2,100-foot section of creek channel/storm drain alignment is bordered by civic, commercial and residential development on the north and south. Some vacant land abuts the alignment east of Park Avenue and sporadically along the southern boundary west of Park Avenue. The western terminus of the earthen creek is the aforementioned storm drain at County Line Road. The eastern creek/storm drain abuts the terminus of a concrete daylight channel. The retention basin abuts residential development on the west, Calimesa Creek (concrete daylight channel) on the south, vacant parcels on the north and residential/retail on the east.

Legally, the project lies in the N ½ of the NE ¼ of the NW ¼ and the NW ¼ of the NW ¼ of the NE ¼ of Section 14 (creek and storm drain) and the NE ¼ of the NW ¼ of the NW ¼ of Section 13 (retention basin), Township 2 South, Range 2 West, San Bernardino Base Meridian as shown on a portion of the USGS *Yucaipa* 7.5' Topographic Quadrangle (fig. 2).

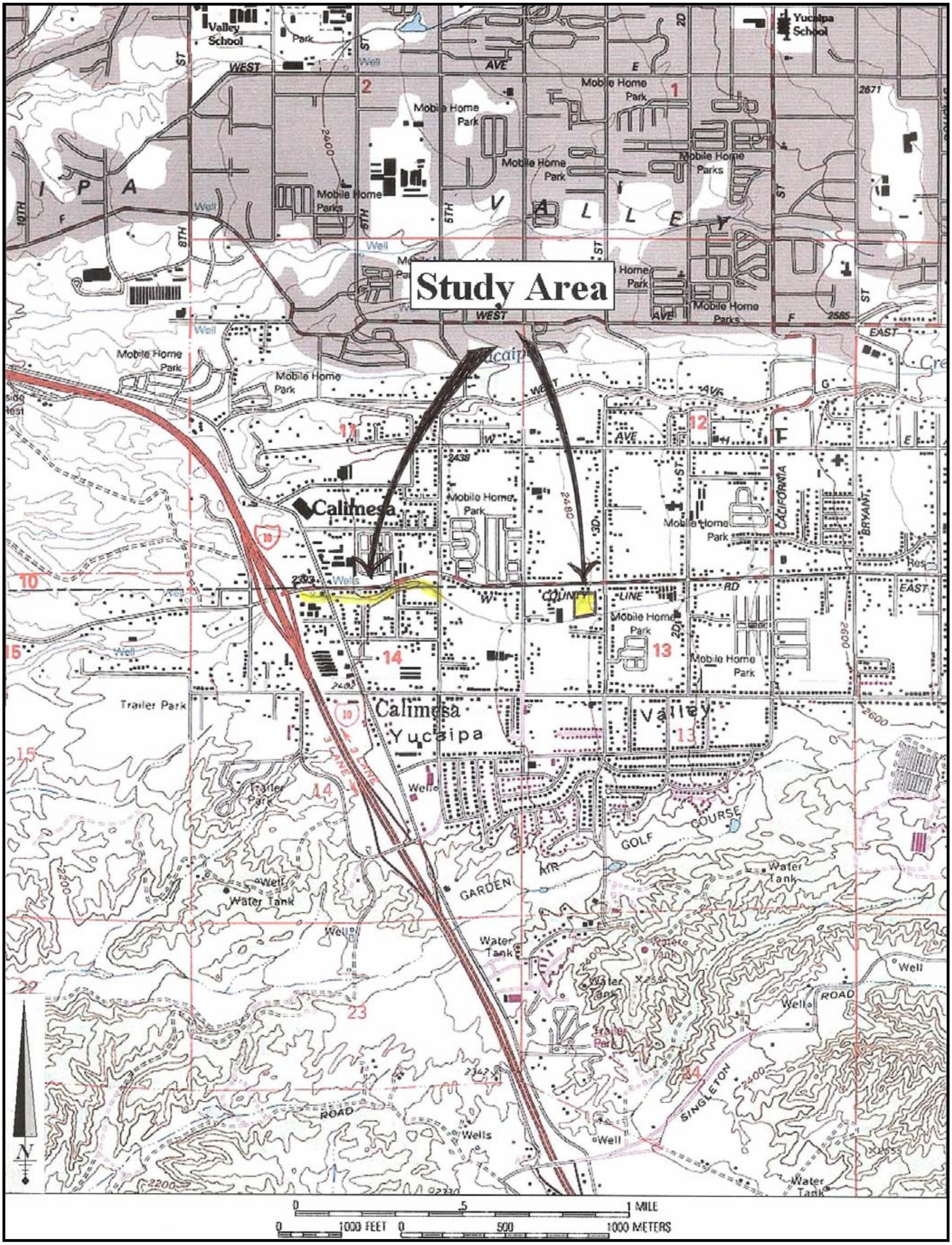

Figure 2. Study area plotted on a portion of the Yucaipa 7.5' USGS Topographic Quadrangle (1996).

B. Natural Setting

The San Gorgonio Pass comprises the readily identifiable geographical territory that separates the Coachella Valley from the San Jacinto and Moreno Valleys. Located at the geologic junction of the Transverse Ranges (San Bernardino Mountains) on the north and the Peninsular Ranges (San Jacinto Mountains) on the south, it is one of the most distinctive areas of Riverside County. For the most part, the pass comprises an east-west oriented lowland covered by both recent and older alluvial fan deposits mainly derived from the San Bernardino Mountains. Two, prominent high peaks, Mount San Gorgonio at 11,485-feet and Mount San Jacinto at 10,831-feet tower above the area. Water originating from the San Bernardino Mountains is drained to points west of the pass via the south fork of the Santa Ana River. To points east of the pass, water is conveyed by the San Gorgonio River into the Whitewater River.

The project area is situated in a region of the county where the climate comprises warm summers and cool winters. August is the hottest month of the year (in the 90s) while December is the coldest (in the high 30s). Typical precipitation includes an annual average of just over 19-inches

Topographically, the terrain is this area of the City of Calimesa is devoid of any significant relief although gently descending as one moves toward the west. The creek has cut a channel that varies in depth from approximately 10-feet below grade at the beginning (east end) to 30-feet near the western terminus. The top width of the channel width is variable (40 to 60 feet) depending on location (fig. 3). Elevations along the creek/storm drain alignment range from a maximum of 2,415-feet above mean sea level at the east end to a minimum of approximately 2,382-feet at the west end. Elevations within the retention basin parcel average 2,480 feet above mean sea level.

Within the portion of the earthen channel, on-site vegetation comprises a dense riparian canopy of trees concentrated west of Park Avenue. East of Park Avenue, trees are sparse and the stream-side habitat is represented by exotic weeds and forbes, non-native opportunistic grasses, and limited sage scrub. Some of the more readily identifiable trees and plants identified included walnut, live oak, elder, ash, eucalyptus, cedar, cottonwood and apricot trees, mulefat, reeds, tumbleweed, oleander, fan palm, cabazilla, wild cucumber, giant bamboo, blackberry and buckwheat. The portion of the study area located east of Park Avenue appears to have been partially denuded of vegetation sometime in the past. Fauna encountered were limited to Red-tailed hawks and ravens.

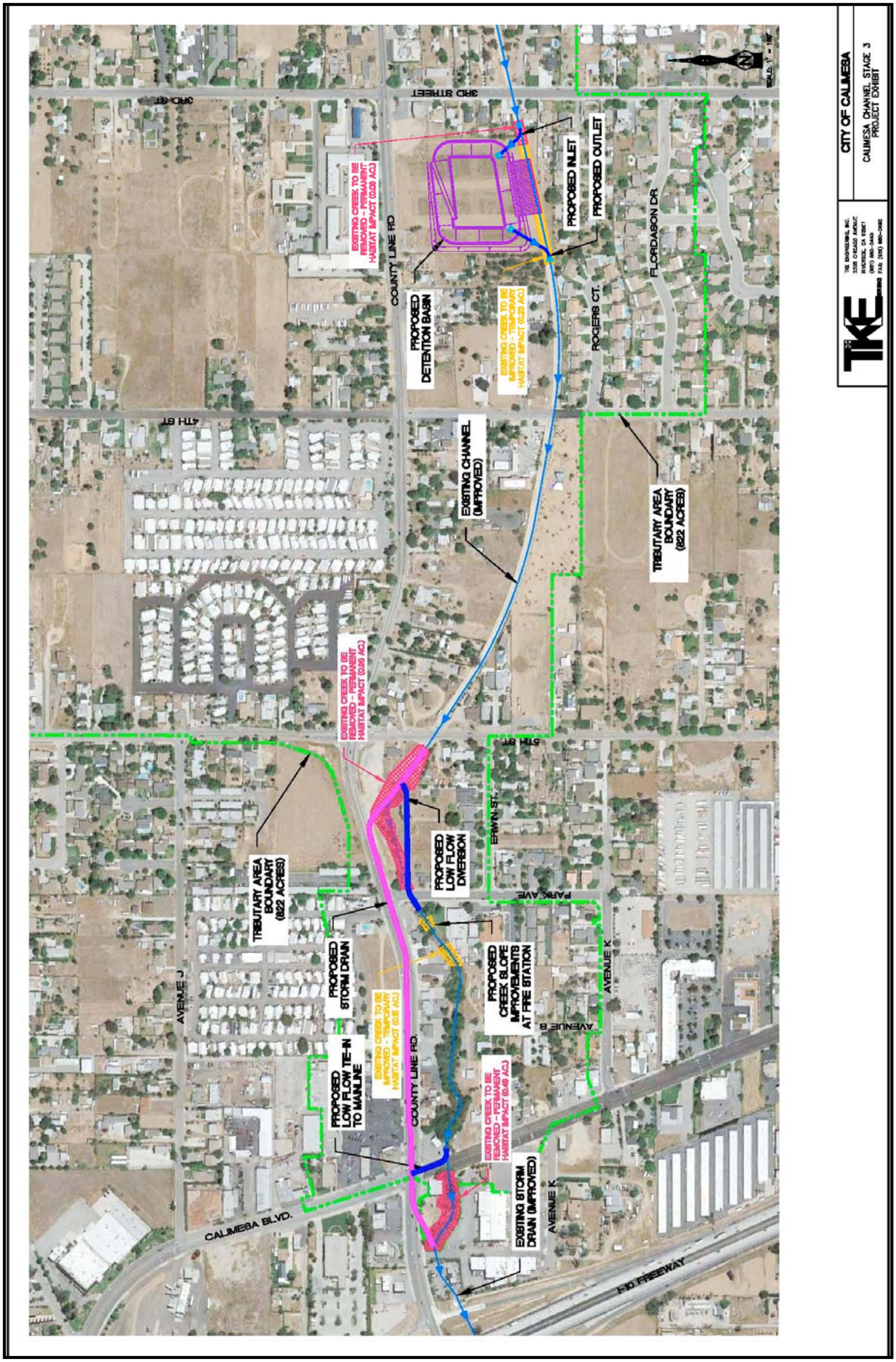

Figure 3. Study area as shown on aerial (**scale unknown**).

Within the proposed retention basin, vegetation is sparse due to discing for weed abatement (fire control). Some of the more readily identifiable trees and plants included walnut (three small juvenile trees in the southwest quarter), buckwheat, short pod mustard, tumbleweed and other exotic weeds and forbes. Soils throughout the project area comprise sandy loam. No bedrock exposures or sources of natural surface water were encountered anywhere within the channel alignment, adjacent to the County Line Road or within the proposed retention basin.

Disturbance within the earthen creek channel is fairly widespread but did not significantly hamper the field investigation. Disturbed areas comprise: 1) construction of Park Avenue and Calimesa Boulevard over the channel and storm drain crossings beneath, 2) construction rubble (e.g. concrete, asphalt) dumped into the channel to stem erosion, 3) a portion of the western channel bottom appears to have been slurried also in an attempt to retard erosion, and 4) vagrant encampments and associated trash (especially within that portion of the creek channel just west of 5th Street). Disturbance within the retention basin footprint comprises the aforementioned discing for weed abatement and numerous geo-technical bore holes.

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C. Prehistoric Occupation of the San Gorgonio Pass

While prehistoric man may have been present in California from the earliest days of the Holocene epoch (circa 10,000 years ago), there is no indication that he frequented the area of the San Gorgonio Pass prior to Late Prehistoric times (beginning circa 1000 A.D.). The Serrano or "Mountaineers" occupied the San Bernardino Mountains and San Timoteo Canyon to the west of the San Gorgonio Pass during this period while the Pass Cahuilla are said to have inhabited at least the eastern half of the Pass. Strong, who was probably as reliable an authority on the subject, regarded the territorial affiliation of the Pass as an insoluble problem:

> That the Pass division of the Cahuilla occupied the San Gorgonio Pass has been generally accepted, but in a recent work Kroeber changed his opinion giving the region in question to the Serrano...This was done in accord with the findings of Benedict [1924] who worked on the Morongo Reservation near Banning in 1922...This general region, due to the breaking down of the culture, the assembling of all dialectic groups on one reservation, and the lack of any tribal unity, is the most complex in southern California. (Strong 1929:10).

It has been suggested that the Highland Springs settlement was the Serrano village of *"Akvat* or *Akavat*" (Anonymous 1972:3-2). This suggestion appears to find its roots in a map published by Kroeber (1925:Plate 57) which shows the village of "*Aka-va-t*" at the eastern end of San Timoteo Canyon northwest of Banning. Tom Hughes (1938) seems also to have regarded Highland Springs as a Serrano site as does Johnston who sums up the situation admirably:

> Indians: Riv-90 [Highland Springs Resort]. There is a set of bedrock mortars here bearing a plaque erected by Guy C. Bogart, late Beaumont sponsor, promoter, and historian. Two lineages are given for this spot by three different anthropologists. Bean [1960] lists the Aekit Wanakik [Cahuilla]. Benedict [1924] and Kroeber [1925] both give Pavukuyam Serrano. The two latter name the place Akvat and Akavat respectively. This probably represents another case of Serrano and Cahuilla Indians living side by side; other like situations are Banning Water Canyon and Mission Creek. (Johnston 1957).

Like all of the prehistoric southern Californians, the Serrano were hunters and gatherers:

> The primary vegetable staples varied with hamlet locality: acorns and pinon nuts for groups living in the foothills [such as Highland Springs]; honey mesquite, cacti fruits, for those living in or near the desert. These principal foods were supplemented by various other roots, bulbs, shoots, and seeds, particularly chia (*Salvia columbariae*)... (Bean and Smith 1978:571).

Game animals included deer, rabbits, mountain sheep, and various birds and small rodents. These were hunted with bow and arrow, rabbit stick, traps, nets, etc. Because of the critical importance of water availability, most villages were located near springs or watercourses--a fact explaining the probable presence of a Serrano camp at Highland Springs.

Serrano villages were small, probably rarely exceeding fifty individuals. Structures were shared by members of individual families and usually comprised circular domed willow frames covered with tule thatching (ibid.). Houses each had a central fire-pit but were probably used principally for sleeping and storage. Day-to-day activities were carried out outside or under ramadas. Besides the houses, a typical Serrano village would have included a ceremonial house, sweathouses, and granaries for acorn storage.

The Serrano never existed as a "tribe" in the political sense, inter-village bonds depending upon ceremonial and social connections:

> All bonds between the [Serrano] groups were of a purely ceremonial nature, and there appears to have been no sort of tribal or political union between them...It is therefore erroneous to speak of such a mythical thing as a Serrano "tribe", for none such existed within historic times, and there is no reason to believe that it ever did. (Strong 1929:14).

It is not known when the Serrano first encountered the Spanish though Pedro Fages visited Serrano territory as early as 1772. This visit would have had negligible effect upon Serrano culture. Bean and Smith postulate that the establishment of an *asistencia* at Redlands around 1819 may have comprised the first influential contact (Bean and Smith 1978:573; *asistencias* were small satellite outposts set up by the central missions to serve outlying areas).

The Serrano living at *Akvat* may have had their first contact with the whites when a Father Gorgonio visited the area prior to 1812 or later when Pauline Weaver and Daniel Sexton first began lumbering operations. Further discussion of these subjects follows below.

D. Historical Overview

1. Early History of San Gorgonio Pass

The earliest Spanish explorers may not have even known of the existence of the San Gorgonio Pass, Anza's interior route between northern Mexico and Alta California having passed to the south. However, the Yuma massacre of 1781 rendered Anza's route dangerous and by the early 1820's the new Mexican government was investigating the possibility of using the San Gorgonio Pass as an alternative (Bancroft 1886:ii, 508). According to Quimby (1975:6) the San Gabriel Mission had set up a station at Banning Water Canyon as early as 1821 and cattle were being raised there in 1823 when the Romero Expedition came through the Pass to explore it as an alternative to Anza's inland route to Alta California.

It is possible that one Spaniard, a Father Gorgonio, was living in the Pass prior to 1812. The papers of a Ms. Ada G. Elder, who gathered stories about the early history of the Pass, stated that:

> ... Doctor Wellwood Murray, an early settler of the Pass and Palm Springs, told Miss Elder that a priest from San Juan Capistrano traveled up the Santa Ana River, through San Timoteo Canyon, and up Singleton Canyon into the Pass where he administered to the Indians. This priest was named Father Gorgonio and the Pass seems to have taken its name from him. He was killed in 1812 so the early date of his influence can be seen. Her paper also reports adobe walls standing on what is now Highland Springs, with no specific facts known as to their origin. (Johnston 1987:95).

On the other hand, Gudde (1965:271) states that in 1824 San Gorgonio was a cattle ranch for the Mission San Gabriel, and that it was named for "Gorgonius, a third-century martyr, whose feast day is September 9." In any event, the adobe walls were said to have been present when the Smith family settled Highland Springs in 1854. The adobe may have belonged to Father Gorgonio as stated by Miss Elder--in this case it would have represented an outpost of the Mission San Gabriel, or it may have been connected with Weaver's development of the Rancho San Gorgonio (Johnston 1957:1).

2. Pauline Weaver and the Rancho San Gorgonio

The first Anglos definitely known to have settled in the Pass were Daniel Sexton and Pauline Weaver who arrived about 1842. Sexton came to the Pass from San Bernardino to start a lumbering business concentrated on what later became Weaver's Rancho San Gorgonio. He hired Indian labor for 25 cents a day and sold his product to Isaac Williams, well-known owner of the Rancho Santa Ana del Chino. Sexton is remembered most for a Fourth of July celebration which he sponsored in 1842:

> Upon being asked by the Indians whether Americans engaged in any annual public celebrations, Sexton had decided to acquaint them with Independence Day...Reportedly highlighting the occasion with a diverse array of events including an opening prayer, a flag-raising ceremony, Indians songs and dances, and two barrels of whiskey, the day's celebration eventually degenerated into a drunken orgy bearing little resemblance to the educational type of program the Indians had requested. (McAdams 1955:53).

> The climax of this fiesta was the flying of the first American Flag to fly in California. Rumor has it he [Sexton] made the flag from his wife's petticoats. (Quimby 1975:6).

Weaver was no less colorful a figure than Sexton. Apparently born Powell Weaver in White County, Tennessee, he was the son of an English Settler while his mother was said to have been Cherokee. The Mexicans called him "Paulino" and the Indians called him "Pauline", the latter becoming his best known name. He was a trapper, farmer, lumberman, prospector, and explorer who is said to have been the first white man to settle in Arizona. He eventually moved to California and settled in the San Gorgonio Pass region west of Noble Creek. More specifically, the 1857 General Land Office Plat Map for Township 2 South, Range 1 West shows Weaver's house in Section 27 adjacent to a creek known today as Little San Gorgonio Creek. It seems probable that he and Sexton may have worked together for a while as both were acquainted with Isaac Williams (who had also been a trapper).

The property now occupied by the Highland Springs Resort was on the eastern margin of what Weaver came to refer to as his "rancho." In 1845 he and Isaac Williams petitioned California's last Mexican Governor, Pio Pico, to grant them the Pass. However, correspondence between Pio Pico and Isaac Williams reveals that Pico was reluctant to make the grant. The problem focused on a portion of land known as "Potrero" or San Jacinto y San Gorgonio, that lay adjacent to the larger San Gorgonio tract. Williams and Weaver incorporated the Potrero acreage into their San Gorgonio petition claiming that it had been abandoned by the original grantee, Santiago Johnson. Consequently, Pico instructed Williams to secure a letter from Johnson, stating that he [Johnson] had no further interest in the grant. Johnson replied that "his ailments do not permit him to appear...that the land...was his, that having sold it to Rubidu [Louis Robidoux], he does not know anything about its condition." Confronted with this complication, Pico imparted to Williams that until the matter with Johnson was resolved, he could not insure concession of any land. Pico ended his communication to Williams with "I shall take care to secure in your favor and that of Mr. Paublino [sic] the land of San Gorgonio, thereby fulfilling the duty of friendship" (Gunther 1984:459). Wrongly, Williams and Weaver took this to mean that they could take possession of the land. This misconception would have serious repercussions in the decades to come as the "Rancho" was parted out. Clearly, had Williams and Weaver amended their request to Pio Pico by dropping the Potrero claim from the petition, they would have been successful in obtaining legal title to the San Gorgonio Pass.

In a paper presented to the Sacramento Book Collectors Club in 1949, Raymond D. Weaver (grand nephew of Pauline Weaver) had this to say about the grant:

> In 1845 we find him [Pauline] on the Rancho San Gorgonio, about 30 miles southeast of San Bernardino. He no doubt has been here for some time as in July of this year he and Julian (Isaac) Williams made application to the last Mexican Governor Pio Pico for this Rancho, dated July 2, 1845. It is signed Julian Williams and Paulino Weaver. This application and map was damaged in the 1906 San Francisco fire, but it has been translated almost in it's [sic] entirety. No record has ever been located of this Grant ever having been confirmed by the United States. (Weaver 1949:4).

In any event, Weaver continued to occupy his portion of the "Rancho San Gorgonio" even after California became a part of the United States. However, this occupation was intermittent. In July of 1846, the American Commander Robert F. Stockton had become confident that Mexico's California forces were completely under control. Consequently, he prepared an official document to this effect and entrusted it to Kit Carson for delivery to Washington. Among those assigned to accompany Carson was Pauline Weaver. The party came across General Kearney's detachment which had been sent by President Polk to seize Mexico's northwestern provinces. Carson subsequently joined Kearney's forces and Weaver was directed on to Santa Fe where he joined the group which later came to be known as the "Mormon Battalion."

By 1850, Pauline Weaver had returned to the Rancho San Gorgonio where he was to play yet another significant role in southern California history. In early 1851, a Cahuilla chief named Antonio Garra plotted a pan-Indian uprising intended to drive the whites out. Weaver recognized the impending danger and set about doing something to thwart it. He contacted chief Juan Antonio (who is said to have been at Sexton's Independence Day celebration [Quimby 1975:6]) and persuaded him to assemble a party of friendly Indians to travel to Warner's Pass and capture Garra. He succeeded though at considerable expense to himself since he had to outfit Antonio with mules and supplies. Antonio was successful and brought Garra and eleven of his band to Rancho San Gorgonio where they were held for the state militia. The state legislature did not get around to compensating Weaver for his expenses during this affair for four years. This may be one reason that he decided to sell off pieces of his rancho, a portion of which includes our study area.

In 1853, the Congress of the United States authorized the United States Army to conduct a land survey to find the most favorable route for a railroad between the Mississippi River and the Pacific Ocean. While on their way from San Bernardino to the Colorado Desert, the party of engineers led by Lt. R.S. Williamson, passed through the San Gorgonio Pass. On November 13, 1853, Weaver's rancho was visited by the survey party and the following notes were taken by Mr. W.P. Blake, geologist for the expedition:

> ...The ascent continued very gradual; at length a short hill brought us to the edge of a broad and gently sloping plain, upon which an adobe house is built. This, although partly in ruins, was occupied by Mr. Weaver, well known as an experienced mountaineer. He is the claimant of a large rancho at this place. The presence of fruit trees and other evidences of cultivation showed that the rancho had been in use for many years, and it is said that the occupants have several times been driven away by the Indians. The situation of this rancho, and the house, is such as one would least expect, being at the summit of the pass. (Blake 1856:90).

Upon returning to Arizona, Weaver resided in Yuma and in the La Paz area supporting his family by trapping beaver and gold mining. He had also resumed his scouting activities and served as an intermediary between the Army and Indian tribes. Despite his good relationship with the natives, in the mid 1860's Weaver was shot by a war party and seriously wounded. He later died in 1867 and was buried at Camp Verde (aka Fort Lincoln) with full military honors. His remains were transferred to the Army National Cemetery in San Francisco. Finally, in 1929 through the efforts of Sharlot Hall (poet and historian), the Boy Scouts, and citizens of Prescott, Arizona, Weaver's remains were returned to Arizona to his final resting place in Prescott (Quimby 1975:6f.).

3. Dr. Isaac Smith and the Smith Ranch

In 1853, Dr. Isaac William Smith and his family came to California from Iowa via Utah. Smith was born in Dexter, Maine in 1806 and later studied medicine in Augusta, Maine. Upon completing his studies, Smith became a physician and practiced medicine in Maine until his wife developed tuberculosis. In search of a dryer climate, they headed west with their two children, Eliza and Hiram. However en route, Mrs. Smith died in Pittsburgh (Hughes 1938:8).

Upon reaching Iowa, Isaac served as surgeon in the U.S. Army at Fort Madison where he remarried and had a daughter, Jane. However, the second Mrs. Smith also died. It was his third wife, Emily Lavina Wright Merriman with a daughter of her own (Emeline) that eventually completed the trek to California with Smith and his children (ibid.). They departed Council Bluffs, Iowa and arrived at the Mormon settlement in San Bernardino in 1853. It was while searching for stray stock in the San Gorgonio Pass that Smith encountered an ill-stricken Pauline Weaver. The outcome of this acquaintance is summarized below:

> Ex-army surgeon Isaac Smith to whom Pauline Weaver sold an undivided third of so-called San Gorgonio Rancho became the first permanent Caucasian settler in San Gorgonio Pass. When he arrived he found Weaver undergoing a painful illness and immediately extended his professional medical services. As Weaver began to recover, he encouraged Smith to remain in the Pass to establish a cattle ranch. Ultimately, Smith decided to accept Weaver's advice and completed the purchase previously described. Together with his wife, three sons, three daughters, and one step-daughter, Smith established the family's residence at Weaver's homesite north of present Beaumont. Upon regaining his health, Weaver reportedly resumed his wandering life as a trapper in Arizona, occasionally returning to the Pass to visit the Smiths and to dispose of his remaining real property rights. (McAdams 1955:65f.).

Officially, it was on the 10th of October, 1853, that Weaver quit claimed to Smith one undivided third part of the Rancho San Gorgonio for the sum of $1000. The property was described as follows:

> ... Commencing at the South East Corner of the San Bernardino Line, thence due North three Leags [sic] thence along the main mountain South Easterly to a certain Branch running to the Valley of San Gargona [San Gorgonio], thence South to the hills that divide San Jasinto [sic] from San Gargona, thence Westerly to the beginning, and known as the San Gorgona Ranch (Deed Book A, page 3, San Bernardino County Archives).

However, the deed from Weaver was mortally flawed. As previously discussed, Weaver and Williams had failed to obtain confirmation to the land from Mexican Governor Pio Pico.

Subsequently, the U.S. Government did not recognize the claim. Williams and Weaver forfeited title to the land and it legally reverted to public domain (McAdams 1955:55). Whether or not Weaver knew for certain that his claim to the "rancho" was unsupported at the time of the sale to Smith is unclear. Smith's actions in later years indicated that he suspected something had gone awry although he seemed to hold out hope that the situation would be successfully resolved.

After having lived at Weaver's residence for about a year, Smith moved his family approximately two miles to the southeast to Section 25 where they established a permanent residence in 1854. He built his home (commonly known as the Smith Ranch) on the site now occupied by the Highland Springs Resort. However, there is much confusion as to the specific quadrant of Section 25 that Smith settled on. According to McAdams (1955:67), in 1857 Smith filed a possessory claim for the N 1/2 of the SW 1/4 and the S 1/2 of the NW 1/4 of Section 25, Township 2 South, Range 1 West totaling 160 acres. By 1868, Smith's "homestead" had grown to 320 acres in size (Deed Book H, pp. 321-322, San Bernardino County Archives). However, in 1874 when Smith was officially granted a homestead patent (#1575) it was for 160 acres comprising the SW 1/4 of Section 25 (Bureau of Land Management).

Like his predecessors, Smith was able and independent. With readily available water for irrigation, he planted fruit trees and a vineyard and began what was to become a successful stock ranch (McAdams 1955:67). Following his initial land purchase, Smith subsequently acquired several horses (mostly mares and colts) and branding iron from Pauline Weaver in 1854 for a sum of $380 (Deed Book A, Page 10 San Bernardino County Archives).

While at the new ranch, the Smiths had four more children (Emily, Ollie, Mary, and Caroline) who were among the first Caucasian infants born in the Pass. The first wedding in the area occurred in 1856 when Jane Smith (daughter by his second wife) married Lt. John Sherburne of the Army Engineers (Hughes 1938:9f.). It was in March of 1868 that Smith eventually sold 1/2 of his undivided 1/3 of the Rancho San Gorgonio to Sherburne (son-in-law) for $1000 (see Table 1). However, this conveyance excluded Smith's "homestead." Apparently aware of Smith's faulty deed papers, Sherburne attempted to complete the papers for the San Gorgonio grant. Insofar as we have been able to ascertain, Sherburne was unsuccessful.

4. Stagecoach Activities in the San Gorgonio Pass

In September of 1857, John Butterfield was awarded the U.S. Mail contract and began studying possible stage routes to Los Angeles. The citizens of San Bernardino were very anxious to have the stage from Yuma pass through San Gorgonio Pass en route to their city. They elected Isaac Smith to the state legislature on a platform favoring the route, and not surprisingly, Smith Ranch was regarded as an excellent potential way-station. In an attempt to get Butterfield to run his stages to San Bernardino, the County Supervisors had Smith, Stephen M. St. John, and Alfred Bybee lay out a county road between San Bernardino and the southeast corner of the county. Unofficially, this route was known as "the Smith Survey." However, despite the efforts of Smith and the citizenry of San Bernardino, Butterfield decided to use the southern route through Warner's Pass (Johnston 1987:105ff.)

Fortunately, the setback was a temporary one. On September 6, 1862, David Alexander's (Colorado Stage and Express Line) first Concord stagecoach traveled from Los Angeles to La Paz, Arizona via the Bradshaw Trail (Johnston 1957; 1987:133). In the San Gorgonio Pass, the stage stop known as "Smith's Station" was established on the Smith Ranch (Highland Springs Resort). The stop provided fresh horses, food, and presumably a place to sleep for stagecoach passengers. Mr. Jim Banks served as proprietor of Smith's Station between 1862-1876 (Johnston 1987:205). According to Holmes (1912:180), it took from 18-20 hours to reach the Smith Ranch from the initial starting point in Los Angeles.

Smith's Station had hardly opened for business when the Superintendent of the Colorado Stage and Express Line, Warren Hall and his leading driver, Henry Wilkinson were murdered. Upon arriving at Smith's Station on the 29th of October, Wilkinson was greeted by Superintendent Hall. Shortly thereafter, the two men discovered that the stage's express box containing $1,200. was missing. They immediately accused a company hostler by the name of Gordon of robbing the stage:

> Wilkinson and his shotgun guard took the suspect up an oak-filled canyon just north of the ranch. They planned to extort a confession by hanging the suspect by the neck, not quite to the point of fatality. After actually raising Gordon off the ground once or twice Wilkinson sent the guard back after Hall, as the suspect would not confess. (Johnston 1987:134).

Gordon subsequently drew a knife with which he attacked both Wilkinson and Hall before escaping. Shortly following the melee, Smith and others found the two men dead from their wounds. Smith is reported to have used the front door of his house to transport both bodies back to the ranch; the blood stains on which were visible for years thereafter. After surrendering to San Bernardino's sheriff, Gordon was later acquitted of the crime on the grounds of self-defense. Although absolved of the murders of Wilkinson and Hall, Gordon's luck finally ran out some years later. He was reported to have been hanged in Montana for the killing of sheepmen.

Other stage stops in the Pass were located on the Gilman Ranch in neighboring Banning and at Whitewater. At the Gilman Ranch (formerly the Noble Ranch), the old adobe home of Jose Pope served as the stage station. It was owned by James M. Gilman who later married Martha Smith (daughter of Isaac Smith). The Whitewater Station, was established in 1860 by Frank Smith (son of Isaac Smith). Smith erected a shack then later an adobe that served as the stage station. Water for the station was conveyed through a ditch dug by Smith to the Whitewater River. It was here on his son's Whitewater ranch in 1878 that Isaac Smith himself met his demise as a result of a gunshot wound inflicted during an Indian altercation (Holmes 1912:179f.; Johnston 1987:119).

III. RESEARCH ORIENTATION

Previous Research

Much of the historic data pertaining to the San Gorgonio Pass and the project vicinity was drawn from literature housed at the Beaumont, Banning and Riverside Public Libraries. Tom Hughes' *History of Banning and San Gorgonio Pass* was published in 1938 and seems to be the first published history of the Pass. Other noted works include Holme's *History of Riverside County* (1912), Gabbert's *History of Riverside City and County* (1935), Gunther's *Riverside County, California, Place Names: Their Origins and Their Stories* (1984), and Quimby's *History of the Potrero Ranch and its Neighbors* (1975). Francis J. Johnston's *The Bradshaw Trail* (1987) is an excellent reference on the history of the Bradshaw and Arizona stage line which passed through the area. However, perhaps the most complete and useful document on the Pass' history is the Master's thesis of H.E. McAdams entitled *Early History of the San Gorgonio Pass: Gateway to California* (1955).

B. Research Goals

The goals of our research were to identify known locations of potential significance resources situated within the study area. Our hypotheses were as follows:

(1) Prehistoric sites may be found almost anywhere but are generally located in areas that offered access to water and plant resources. In this area, due to particularly arid conditions, sources of permanent or semi-permanent water would have offered the best chance for settlement or seasonal encampments. Thus, within the pass itself, the topographic transition zones from the lowlands to the mountains/foothills would be considered higher probability than the valley floor. This would hold true not only for the presence of dependable sources of water, but also the diverse communities of flora and the animals they would attract. Ideally, oak groves or seasonal water courses lined with oak trees would have been most attractive for gathering and processing sites. Granitic boulders and outcrops were also commonly utilized as milling stations for vegetal foodstuffs and to a lesser extent rock shelters and rock art sites.

(2) Historic sites in the region would most likely be associated with early ranching, fruit growing and general farming activities. Lacking standing structures, remains of these homesteads and farmsteads typically comprises concrete, river cobble or adobe structure foundations, irrigation systems and trash scatters. However, not all debris scatters (e.g. tin can, glass, crockery) can be connected to a particular home or farmstead. In many instances, isolated scatters of dumped historic debris represent nothing more that illicitly discarded rubbish.

IV. METHODS

A. Records Searches

In-person records searches of the project alignment and location of the proposed retention basin were conducted by Robert S. White at the Eastern Information Center (EIC), University of California at Riverside and at the Archaeological Information Center at the San Bernardino County Museum in Redlands. The searches entailed a review of all previously recorded prehistoric and historic archaeological sites situated on or within a one-mile radius of the project area. Additionally, the National Register of Historic Places (NRHP), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the Office of Historic Preservation's Directory of Properties (DOP) were reviewed for the purpose of identifying any historic properties.

1. Previously Recorded Prehistoric and Historic Resources Within the Study Area

The results of the search indicated that no prehistoric or historic archaeological resources (sites, structures, isolates) have been previously recorded within the boundaries of the undertaking.

2. Previously Recorded Archaeological Sites/Isolates Within a One-Mile Radius

Five prehistoric archaeological sites have been documented within a one-mile radius of the study area. All lie to the northwest. They comprise an isolated burial, ground stone scatter, large lithic and groundstone scatters and a sparse lithic scatter. The closest prehistoric site to the project is CA-SBR-428. This location is described as a large lithic and groundstone scatter that has been destroyed (Smith 1934). It lies approximately 3/5-mile to the northwest.

There is one recorded historic archaeological site and one historic isolate within a one-mile radius. The site, #33-15300, is characterized as a portion of a wooden pole line with date tags of "40" and "50". It lies approximately ½-mile to the south. The historic isolate, #33-15299, consists of two fragments of an older bottle dating between 1880-1914. It lies approximately ½-mile to the southwest.

3. Previously Recorded Historic Structures Within a One-Mile Radius of the Study Area

Outside the study area, nine historic structures have been recorded within a one-mile radius (Table 1). The closest historic building to the study area (CRM TECH 3530-1H, temporary field designation) lies just to the east of the proposed retention basin across 5th Street (Tang and Hogan 2019).

4. Previous Surveys

The results of the search indicated that the study area has not been previously surveyed for cultural resources. Outside the property, approximately 5% of the surrounding one-mile radius has been investigated. These studies comprise small acreage surveys (40 acres or less), large acreage surveys (more than 40 acres), and linear projects (roads and utilities). Eight survey reports are on file with the Eastern Information Center and the Archaeological Information Center for the one-mile search radius. The closest survey to the study area comprises a 5-acre assessment of the County Line Service Station, LP project. The assessment resulted in the identification of a single-family residence (1946-1962) that is not considered historically significant (Tang and Hogan 2008).

Table 1. Historic Buildings/Structures within a One-mile Radius of the Study Area.

Site Number	Site Description
33-13993	Earthen reservoir, well and cistern constructed in early 1950s.
33-13395	Remnant of a 1940's concrete house slab, well and well shed
33-16792	Small residential complex located at 1118 7th Street, Calimesa. Constructed circa 1929.
33-16793	Vernacular farmhouse with Craftsman elements and associated barn located at 726 W. Avenue L, Calimesa. Constructed in mid 1910s.
33-17258	Ranch style residence located at 946 7th Place, Calimesa. Constructed 1946-1962.
36-10822	Drainage feature comprising 12' diameter riveted pipe and headwall located near the intersection of Colorado Street and Nebraska Lane, Yucaipa. Estimated construction date of late 1930s to mid-1940s.
36-12607	Water reservoir w/earthen dam and spillway located adjacent to Yucaipa Creek at the I-10 Calimesa Rest Area. Constructed in 1935.
36-12608	Pump house w/engine driven mechanical pump located 45-meters south of Yucaipa Creek near Interstate 10. No date of construction given.
CRM TECH 3530-1H (temporary field number)	Single story, single family, ranch style house constructed in 1958. Located at 295 S. California Street, Calimesa. Determined not to be historically significant.

5. Heritage Properties

No listed National Register of Historic Places (NRHP), California Historical Landmarks (CHL), or California Points of Historical Interest (CPHI) properties have been recorded within the study area nor within a one-mile radius.

6. Historic Map Research

In addition to the records searches, several historic GLO and Geological Survey (USGS) maps of the Calimesa region were inspected. These maps are on file with one or more of the following entities: Bureau of Land Management, Map Room of the Science Library at UC Riverside, the USGS TopoView Historic Topographic Map Database, and the California Historic Topographic Map Collection housed in Special Collections at the Merriam Library at California State University, Chico. These included:

GLO 1871 Plat Map Township No. 2 South Range No. 2 West, SBBM; surveyed in 1853.

Southern California Sheet No.1, 1:250,000, 1901 reprinted 1948, surveyed 1893-1900.
Redlands 15' 1901, surveyed 1898-1899.
Yucaipa 7.5' 1954.
Yucaipa 7.5' 1967, photorevised 1973.

A review of these maps was performed for the purpose of identifying locations of potential historical resources. The results of the map research indicated that man-made features (e.g.: roads and structures) did not exist in the area until sometime after 1901. Numerous structures as well as the subject section of Calimesa Creek appear on either side of County Line Road on the *Yucaipa 7.5*' 1954 sheet.

7. Land Patents

Archival research also included a review of land patents on file with the Bureau of Land Management (BLM) in Sacramento. The creek and alignment lies in the N ½ of Section 14 and in the SE ¼ of Section 11, Township 2 South, Range 2 West, San Bernardino Base Meridian. The proposed retention basin lies in the NW ¼ of Section 13, also in Township 2 South, Range 2 West, SBBM. Office records indicate that a serial land patent for 6,410.05 acres including the N ½ of Section 13, the N ½ of Section 14, and the entirety of Section 11 (encompassing the study area) was issued to the State of California on September 24, 1872 by authority of the September 4, 1841: Grant-Certain Land to State (5 Stat. 453). The land patent is recorded as Accession No./BLM Serial Nr: CACAAA 080618.

V. NATIVE AMERICAN SCOPING

A. Sacred Lands File Check

On September 27, 2013, a Sacred Lands File Check for the project area was requested by Ms. Laura S. White, M.A. The search was conducted on October 1, 2013 by Mr. Dave Singleton, Program Analyst for the Native American Heritage Commission in Sacramento. The results of the search indicated that no sacred Native American sites have been recorded within the boundaries of the study area. A list of both individual and Native American groups was also provided for further scoping (Appendix C).

B. Native American Correspondence

In order to learn more about the potential archaeological sensitivity of the project area, letters of inquiry were sent to all Native American individuals and groups included on the NAHC contact list (Appendix C). To date, one response has been received. The reader is referred to Appendix D for written correspondence.

VI. FIELD SURVEY

A field reconnaissance of the original study area (creek channel) was conducted by Robert S. White (Principal Investigator, County approved), Laura S. White, M.A. (surveyor; RPA and County approved) and Susan R. Klein in August 2013 and February 2014. The pedestrian survey began at the east end of the project and proceeded in a westerly direction. Surface visibility varied between 0 and 100% depending on the density of the low-lying vegetation and riparian canopy.

Where feasible, the survey was conducted by walking parallel transects spaced at 1-2 meters along each side of the creek. Meandering transects were used when parallel transects were impractical. Additionally, meandering transects were employed in the bottom of the creek where access was possible. In particular, the creek bank escarpments were examined for any signs of buried archaeological deposits. By employing these techniques, a thorough survey of the alignment was accomplished.

The field survey of the low flow diversion and the retention basin took place on September 10 with follow-up work on October 4, 2019. Visibility in both areas was very good varying 85 to 100% depending the density of the low-lying vegetation. Parallel transects spaced at 1-2 meters were utilized across the low flow diversion alignment and 5-10 meters within the proposed retention basin.

VII. REPORT OF FINDINGS

A. Prehistoric Resources

The results of all field investigation were entirely negative. No prehistoric resources of any kind were encountered within the boundaries of the study area.

B. Historic Resources

A concrete storm drain adit (structure) was encountered in the bottom of Calimesa Creek underneath Calimesa Boulevard just south of County Line Road (figs. 4 & 5). It is not a pre-cast structure. Rather, it is constructed of formed and poured concrete reinforced with steel (rebar). The western adit has a maximum width of 85-inches. Interior height was indeterminate as it was flooded with water and mud. However, it is esitmated to be 72-inches high. Tunnel behind adit is 60-inches square. Header over entrance bears the cast date of “1930”. Date panel is 20-inches wide and 9-inches high. Surmounting the header are courses of cement-filled sandbags, approximately 2 ½-feet high. This structure was constructed for the sole purpose of conveying seasonal flows in Calimesa Creek beneath Calimesa Boulevard. It was constructed in 1930 using modern materials and techniques.

VIII. DETERMINATIONS OF ELIGIBILITY

The storm drain structure was evaluated for significance under criteria based on two separate but overlapping legislative sources: (1) the National Historic Preservation Act of 1966 (NHPA), which includes criteria for eligibility to the National Register of Historic Places (NRHP); and (2) the California Environmental Quality Act (CEQA), as amended in 1992, which includes criteria for eligibility to the California Register of Historical Resources (CRHR).

Essentially, all resources which have been determined eligible for the National Register are also eligible for the California Register, but the latter also provides for the inclusion of additional resources that have been identified by historic resource surveys or that have been designated as a result of a local landmark ordinance. Thus, many cultural resources are significant under California law but need not be addressed under Federal law. The situation is further complicated by the fact that the criteria applied to assess impacts on historic resources differ between federal and state statutes.

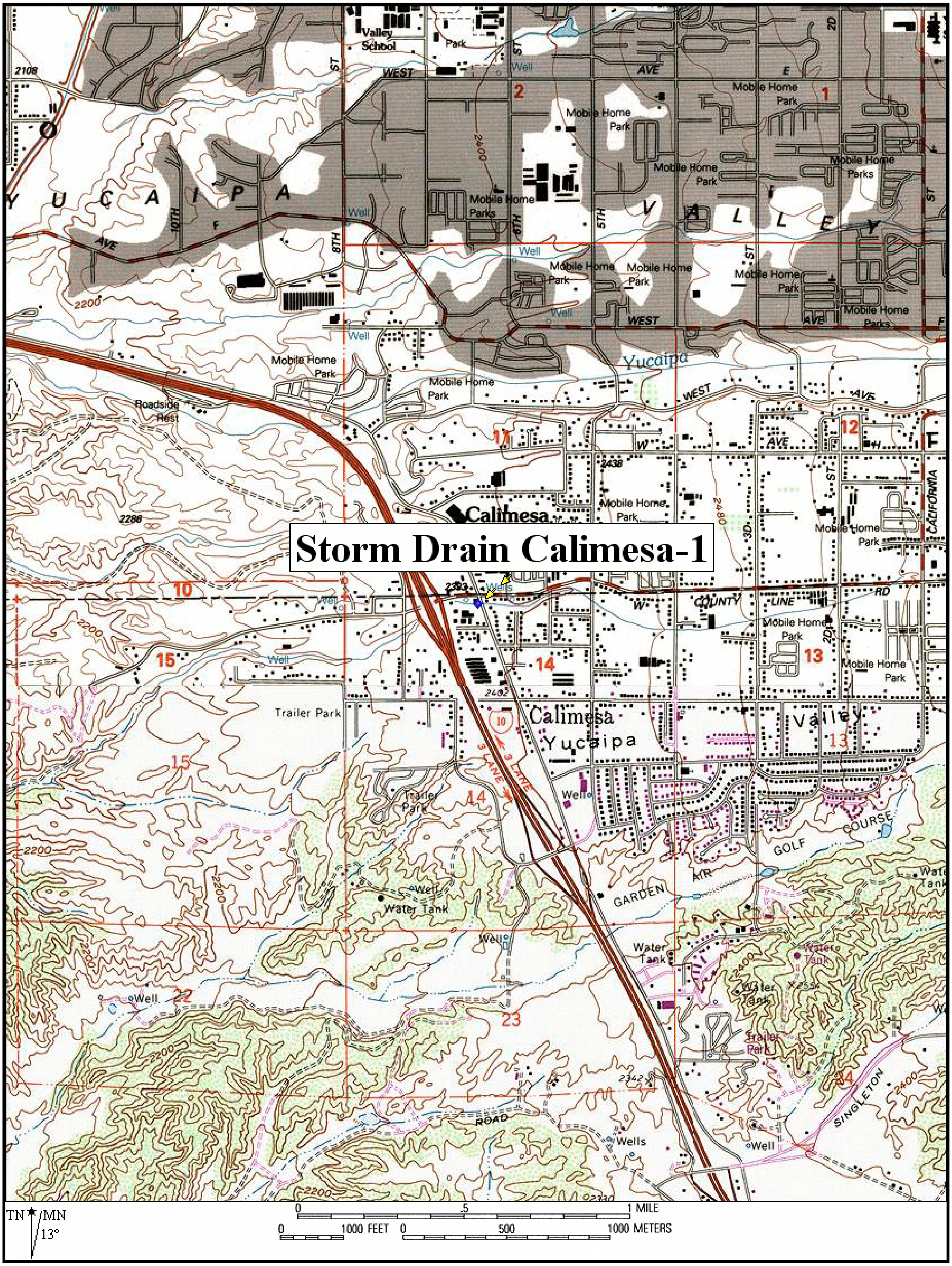

Figure 4. Location of historic storm drain plotted on a portion of the *Beaumont* 7.5' USGS Topographic Quadrangle (1996).

Figure 5. Location of historic storm drain (P33-023900) as shown on aerial photograph.
(scale unknown)

archaeology, engineering, and culture …present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association ..." and ...

(A) That are associated with events that have made a significant contribution to the broad patterns of our history or

(B) That are associated with the lives of persons significant in our past; or

(C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D) That have yielded, or may be likely to yield, information important in prehistory or history."

B. CEQA Compliance

According to Section 15064.5 of CEQA, a resource may be listed as an historical resource in the California Register of Historical Resources if it meets one or more of the following criteria:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

(2) It is associated with the lives of persons important to local, California, or national history;

(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

C. NRHP and CRHR Evaluation

Criterion A

Fairly extensive research has indicated that the storm drain structure located on the west side of Calimesa Boulevard just south of County Line Road is not associated with any historic event important in the regional history of California or the United States. Consequently, it does not appear eligible for listing in either the NRHP or the CRHR under Criterion A.

Criterion B

Research has also failed to identify any person associated with the structure as important or prominent to National or California history. Therefore, it does not appear eligible for listing in the NRHP or CRHR under Criterion B.

Criterion C

Criterion C posits eligibility on the basis of style or artistic merit. The engineering structure is not the work of a master architect or builder. Furthermore, it does not possess high artistic value and is not a distinctive example of any particular engineering style. For this reason, this simple storm drain does not appear to embody the kind of architectural distinction that would qualify it for inclusion into the NRHP or CRHR under Criterion C.

Criterion D

Under Criterion D, the storm drain is not likely to yield information about the history or prehistory of the area as this criterion primarily pertains to archaeological sites. Therefore, it does not appear eligible for listing in the NRHP or CRHR under Criterion D.

IX. MANAGEMENT CONSIDERATIONS

A. Prehistoric Resources

The results of the records searches and field studies were negative for the presence of prehistoric resources within the project area. Therefore, no further work in conjunction with prehistoric resources, including monitoring of any future grading activities, is warranted or recommended.

B. Historic Resources

The storm drain structure on the west side of Calimesa Boulevard south of County Line Road comprises an historic resource that does not appear significant within the meaning of NEPA or CEQA. Therefore, no further work in conjunction with historical resources is recommended for the drain structure. As a matter of course, Department of Parks and Recreation (DPR) 523A (Primary Record) and 523B (Building, Structure, and Object Record) forms were completed for the storm drain and submitted to the Eastern Information Center (EIC) at UC Riverside (Appendix E). The EIC has assigned Primary # 33-023900 to the resource.

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Plate I. Top: Westerly, downstream view from terminus of concrete, trapezoidal daylight channel at the beginning of the of the project (east end). **Bottom:** Looking eastward upstream from Park Avenue.

Plate II. Top: Westerly view looking downstream from Park Avenue.
Bottom: Looking eastward upstream toward Park Avenue from fire station.

Plate III. Top: Westerly view looking downstream from behind 577 County Line Road.
Bottom: Easterly view upstream from behind law offices at 601 County Line Road.

Plate IV. Top: Northeasterly view of storm drain on located on west side of Calimesa Boulevard. **Bottom:** easterly view of storm drain adit constructed in 1930.

Plate V. Top: Close-up of construction date cast into head frame over storm drain adit.
Bottom: Easterly view looking upstream through canopy from the western project terminus.

Plate VI. Top: Looking east along alignment of proposed low flow diversion.
Bottom: Looking northeast across proposed retention basin from the southwest parcel corner.

APPENDIX A: Personnel Qualifications

ROBERT S. WHITE, PRINCIPAL INVESTIGATOR

* 1987 B.A. in Liberal Studies with emphasis in Anthropology, California State University, Long Beach.
* 1977 A.A. Degree in Liberal Arts, Los Angeles Harbor College.
* Riverside County Certified Archaeologist #164
* Orange County Certified Archaeologist
* Holds a "blanket" Cultural Resource Use Permit on the supervisory level with the Bureau of Land Management (BLM) for the Ridgecrest, Barstow, Palm Springs, El Centro, and Needles desert resources areas.
* 30 years of full-time experience conducting cultural resource management projects in southern California.

LAURA S. WHITE, FIELD DIRECTOR

* 1989 M.A. in Anthropology with emphasis in Archaeology, San Diego State University, San Diego.
* 1981 B.A. in Anthropology, University of San Diego, San Diego.
* Member of the Register of Professional Archaeologists (RPA)
* Riverside County Certified Archaeologist #165
* Orange County Certified Archaeologist
* San Diego County Certified Archaeologist
* Holds a "blanket" Cultural Resource Use Permit on the supervisory level with the Bureau of Land Management (BLM) for the Ridgecrest, Barstow, Palm Springs, El Centro, and Needles desert resources areas.
* 28 years of full-time experience conducting cultural resource management projects in southern California.

Curriculum Vitae

Richard Bryan Guttenberg

Archaeological Associates
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Sun City, CA 92586

rguttenberg@jma-ca.com

EDUCATION

Master of Arts

M.A. Anthropology – emphasis in Archaeology, 2014, California State University Los Angeles.

Geographic Information Systems Certificate, 2014, California State University Los Angeles.

Post-Baccalaureate Education

Identification and Evaluation of Mid-20th-Century Buildings, May 2010, National Preservation Institute.

Bachelor of Art in Anthropology

Emphasis in Archaeology, 1997, California State University, Long Beach.

RESEARCH INTERESTS

California archaeology and ethnohistory, hunter/gatherer maritime adaptations, Channel Islands archaeology, emergence of complex societies, prehistoric migrations, lithic technology, GIS and spatial analysis, remote sensing, architectural history.

HONORS AND AWARDS

Scholarship and Award Recipient, 2010. Administered by California State University, Los Angeles

Special Recognition in Graduate Studies, 2010, Administered by California State University, Los Angeles.

Cotsen Fellowship, Summer 2010, Administered by California State University, Los Angeles.

Member, Phi Kappa Phi Honor Society.

PROFESSIONAL EXPERIENCE

1997-Present Vice President-Cultural and Natural Resources, JMA-John Minch and Associates, Inc., 26623 Sierra Vista Mission Viejo, CA 92692

Serves as Vice President and senior project manager with over thirteen years of experience working in environmental regulatory compliance.Project experience includes cultural / paleontological resource management and biological services in as many as 14 counties throughout California. Current duties include the planning, management and implementation of environmental consulting services and regulatory documentation for a variety of private and municipal projects with multiple Stakeholders. Seven years of management experience in compliance with the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Section 106 consultations, Native American consultations, and scoping,Historic American Building Survey and Historic American Engineering Record (HABS/HAER), Storm Water Pollution Prevention Plans (SWPPP) and inspection of Best Management Practices (BMP), and the Migratory Bird Treaty Act (MBTA). Works directly with several Principal Investigators and serves as lead contact for clients. Experience coordinating with local, state and federal agencies including: the City of Los Angeles, Sanitation Districts of Los Angeles County, State Water Resources Control Board – Los Angeles, South Coast Air Quality Management District, California Energy Commission, California Coastal Commission, California Department of Fish and Game, Army Corps of Engineers, United States Fish and Wildlife Service, and the United States Environmental Protection Agency.

Other responsibilities include thehiring, training,and schedulingof field staff, management of field and laboratory materials and equipment, curation, preparation, and analysis of archaeological and paleontological collections, performing assessments of archaeological and paleontological resources, archaeological record searches, design and implementation of archaeological and paleontological monitoring programs, archaeological site recordation and reporting, report writing and editing, GIS mapping and analysis, and business marketing.

RESEARCH AND FIELD EXPERIENCE

Project Manager: Phase I Archaeological Survey, CH2MHill for National Aeronautics and Space Administration (NASA) –Santa Susana Field Laboratory (SSFL), Canoga Park, CA. 2014 - present.

Designed, managed, and implemented a cultural resources Phase I survey of the NASA administered areas at the SSFL. Assisted in coordinating Native American Stakeholder consultations, co-authored project documentation, constructed GIS maps and figures, and assisted with archaeological site recordation. Currently manages and coordinates a large crew of archaeological monitors for soil sampling and remediation activities at SSFL.

Project Manager: Phase I Archaeological Survey, Boeing Company, SSFL, Canoga Park, CA. 2013 – present.

Designed, managed, and implemented a cultural resources Phase I survey of the Boeing administered areas at the SSFL. Assisted in coordinating Native American Stakeholder consultations, co-authored project documentation, constructed GIS maps and figures, and assisted with archaeological site recordation. Currently manages and coordinates a large crew of archaeological monitors for soil sampling and remediation activities at SSFL.

Project Manager: Archaeological / Paleontological Services and Environmental Compliance, Republic Services, Inc., Sunshine Canyon Landfill, Sylmar, CA. Summer 2005 – present.

Project manager duties include assessment, coordination and implementation of biological, archaeological, and paleontological investigations for City Landfill extension, responsible for daily groundwater quality sampling and weekly reporting of collected samples, coordination of migratory nesting bird surveys, management of workface air quality study, scheduling, and client and agency coordination, and annual reporting.

Project Manager: Archaeological Monitoring Program, Santa Susana Field Laboratory, HydroGeoLogic, Inc., Building 204, 5800 Woolsey Canyon Rd., Canoga Park, CA, 91304. Spring 2010 – present.

Designed, managed, and implemented a cultural resources monitoring and protection plan for a radiological sampling investigation conducted by the Environmental Protection Agency and the United States Department of Energy. Assisted in coordinating Section 106 and Native American Stakeholder consultations, co-authored project documentation and constructed GIS maps and figures. Managed and coordinated a large crew of archaeological monitors, and assisted with archaeological site recordation.

Project Manager: Archaeological – Paleontological Services, El Segundo Repowering Project, NRG Energy, Inc., 301 Vista Del Mar, El Segundo, CA 90245. Winter 2005 – present.

Managed and assisted with the design and implementation of both a Cultural and Paleontological Resources Monitoring and Mitigation Plan (CRMMP/PRMMP) for the redevelopment of the El Segundo Power Plant. Assisted with regulatory documentation in compliance with the California Energy Commission. Managed and directed archaeological and paleontological resource monitoring of heavy construction activities.

Project Manager: Archaeological – Paleontological Investigation,Chatsworth Reservoir Wetland Restoration Project, Republic Services, Inc. 2005 – Present.

Assisted with design of archaeological and paleontological investigation, records search of cultural resources, participation in field reconnaissance survey, co-author of survey report, client and agency coordination.

Project Manager/Field Director: Archaeological and Paleontological Investigations, Sanitation Districts of Los Angeles County, various projects, Spring, 2008 –present.

> Ongoing management of various projects concerning cultural and paleontological resources, record searches, assessments, monitoring, client and agency coordination.

Research Assistant: California State University Los Angeles, San Nicolas Island Field School, Summer 2010.

> Conducted archaeological fieldwork and laboratory analysis including excavation, screening, mapping, and collection of GPS data with Trimble GeoXH. Principal investigator is Dr. René Vellanoweth.

Research Assistant: California State University Los Angeles, San Nicolas Island Field School, Summer 2009.

> Conducted archaeological fieldwork and laboratory analysis including excavation, screening, and record keeping. Principal investigator is Dr. René Vellanoweth.

Field Director / Archaeological and Paleontological Monitor: Saddlewood Residential Housing Project, Standard Pacific Homes, Inc., Walnut, CA, Winter 2005 – Summer 2007.

> Archaeological and Paleontological resource monitoring, fossil preparation, curation, mapping, and report editing**.**

Biological Monitor: Browning Ferris Industries, Inc. / Allied Waste, Inc, Sunshine Canyon Landfill, Spring 2004 – Summer 2006.

> Biological monitoring of City Landfill expansion project, monitoring and inspection of heavy construction activities associated with a CDF&G 1603 Streambed Alteration Agreement, ACOE 404 Agreement, groundwater sampling and reporting, assistance with coordination of ornithological mist-netting, and wildlife trapping and re-location.

Field Director / Archaeological Paleontological Monitor: Whispering Hills Residential Housing Project and San Juan Hills High School, Concorde Development, Inc., San Juan Capistrano CA, Summer 2003 – Winter 2005.

> Field reconnaissance survey, archaeological salvage excavation, archaeological / paleontological monitoring, paleontological salvage, fossil preparation, curation, mapping, report editing.

Field Director / Paleontological Monitor: Various projects,Temecula,CA, Spring 2002 – Spring 2004.

> Paleontological resource monitoring and salvage on various small projects in Temecula, Wildomar, and French Valley, Riverside County, CA. Assisted with editing and production of final monitoring reports.

Field Director: Archaeological/Paleontological Investigation, Vista Del Verde Residential Development and Black Gold Golf Course, Villages III and IV, Toll Brothers, Inc., Yorba Linda, Orange County, CA, Winter 2003 – Fall 2003

Assessment, coordination, and implementation of archaeological / paleontological investigation designed for large residential golf course development, archaeological / paleontological monitoring, laboratory analysis, curation, mapping, and report editing.

Field Director: Mission San Juan Capistrano's Trabuco Aqueduct,City of San Juan Capistrano, Orange County. Winter 2002.

Archaeological monitoring of grading activities that uncovered Mission-era feature and let to the identification of the aqueduct.Project Manager/Field Director duties include direct assistance to the Principal Investigator in study to discover, excavate, and record the physical remains of the historic feature, an early 19th century aqueduct that served The Mission San Juan Capistrano.

Field Director: Paleontological Investigation, California Fiber Optic Cable Project, Williams Communications, Inc., Counties of Contra Costa, Mendocino, Nevada, Placer, Sacramento, Solano, Sonoma, Washoe, and Yolo. Winter 1999 – Fall 2000.

Direction, coordination, and implementation of paleontological investigation designed for multi-county installation of fiber optic cable in Northern California. Paleontological monitoring, training and staffing.Provided logistical support for field crew along several hundred miles of linearalignment/right-of-way.

Field Director: Archaeological/Paleontological Investigation, Vista Del Verde Residential Development and Black Gold Golf Course, Villages I and II, Toll Brothers, Inc., Yorba Linda, Orange County. Spring – Fall, 1999.

Participated in pre-construction field reconnaissance survey, assessment, coordination, and implementation of archaeological / paleontological investigation designed for large residential golf course development, archaeological / paleontological monitoring, laboratory analysis, curation, mapping, and report editing.

Field Director / Paleontological Monitor: Variousprojects, Orange and Los Angeles County, CA, Spring 1998 – Spring 1999.

Archaeological and Paleontological resource monitoring and salvage on various small projects in Simi Valley, Sylmar, Newhall, Anaheim Hills, and Diamond Bar, CA. Assisted with editing final monitoring reports.

Field Archaeologist / Paleontologist: Archaeological/Paleontological Investigation, **Ocean Trails, LLC / Trump National Golf Club, Golf Course and Residential Development,** Palos Verdes, Los Angeles County. Winter 1998 – Summer 2002.

Participated in all aspects of the investigation including: survey, monitoring, excavation, wet screening, artifact identification, laboratory analysis, and artifact preparation and curation.

Field Archaeologist: Archaeological Investigation, San Buenaventura Mission – Holy Cross Parish School, Los Angeles Catholic Archdiocese, City of Ventura, Ventura County.Summer 1997.

Participated in all aspects of the investigation including: survey, monitoring, excavation of pre-historic components as well as Spanish Colonial architecture, wet-screening, artifact identification, record keeping, laboratory analysis, and artifact preparation and curation.

PRESENTATIONS

1996 Symposium on remote sensing techniques in archaeology. Research paper presented at the 30th annual meeting of the Society for California Archaeology, Bakersfield, California, April 3–6.

2011 Symposium on GIS as a Tool for Intrasite Spatial Analysis at CA-SNI-25, San Nicolas Island, CA. Research paper presented at the 76th annual meeting of the Society for American Archaeology, Sacramento, California, April 1st.

PAPERS and PUBLICATIONS

2013 **Richard B. Guttenberg**, René L. Vellanoweth, William E. Kendig, Rebekka G. Knierim, and Steven J. Schwartz, Geographic Information Systems as a Tool for Analyzing Intrasite Spatial Variability on San Nicolas Island. In *California's Channel Islands: The Archaeology of Human-Environment Interactions,* edited by C.S. Jazwa and J.E. Perry, pp. 97-112. University of Utah Press, Salt Lake City.

2009 **Richard B. Guttenberg** and Ray Corbett,*Cultural Resource Monitoring and Mitigation Plan for Excavations at the Arco/British Petroleum Carson Refinery, City of Carson, California.*Unpublished report on file, British Petroleum Refinery, City of Carson, California.

2010 Ray Corbett and **Richard B. Guttenberg**, *Substation 25 Replacement Project, Cultural Resources Final Monitoring Report (LAN-2682), City of Carson, California.*Unpublished Report on file, British Petroleum Refinery, City of Carson, California.

2010 **Richard B. Guttenberg** and Ray Corbett, *Cultural Resources Assessment, Santa Susana Field Laboratory, Area IV Radiological Study, Ventura County, CA.* Unpublished report on file, United States Environmental Protection Agency, Region 9, San Francisco, California.

2010 **Richard B. Guttenberg** and Ray Corbett, *Project Description and Cultural Resources Assessment, Santa Susana Field Laboratory, Northern Undeveloped Lands Radiological Study, Ventura County, CA.* Unpublished Report on file, United States Environmental Protection Agency, Region 9, San Francisco, California.

PROFESSIONAL AFFILIATIONS

Society for American Archaeology
Society for California Archaeology
Pacific Coast Archaeological Society
Los Angeles Conservancy

APPENDIX B: Records Search Results

APPENDIX E

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P33-023900
HRI #
Trinomial
NRHP Status Code: 6Z
Other Listings
Review Code Reviewer Date

***Resource Name or #:** Calimesa Creek -1 **Caltrans Map Reference No.:** N/A

P1. Other Identifier: C-1

***P2. Location: *a. County** Riverside **County/Route/Postmile:** N/A

b. Address Calimesa Boulevard at County Line Road

City Calimesa **Zip** 92320

***c. UTM: USGS Quad:** Yucaipa 7.5' **d. UTM:** Zone 11, 494337 mE/ 3762365 mN

***e. Other Locational Data (APN #)** Bottom of Calimesa Creek immediately west of Calimesa Boulevard at County Line Road. NE ¼ of the NE ¼ of the NW ¼ of Section 14, Township 2 South, Range 2 West, SBBM.

***P3a. Description:** (Briefly describe resource below)

This is an active, concrete storm drain located in the bottom of Calimesa Creek underneath Calimesa Boulevard just south of County Line Road. It is not a pre-cast struture. Rather, it is constructed of formed and poured concrete reinforced with steel (rebar). The western adit has a maximum width of 85-inches. Interior height was indeterminate as it was flooded with water and mud. However, it is esitmated to be 72-inches. Tunnel behind adit is 60-inches square. Header over entrace bears the cast date of "1930" Date panel is 20-inches wide and 9-inches high. Surmounting the header are courses of cement-filled sandbags, approximately 2 ½-feet high.

***P3b. Resource Attibutes:** HP11. –Engineering Structure

****P4. Resources Present:** ___ Building X Structure ___ Object ___ Site ___ District ___ Elements of District ___ Other

P5b. Description of Photo: Looking east at west adit.

***P6. Date Constructed/Age:** 1930 (factual)
X Historic ___ Prehistoric ___ Both

***P7. Owner and Address:**
City of Calimesa
908 Park Avenue
Calimesa, CA 92320

***P8. Recorded by:**
Robert S. White
Archaeological Associates
P.O. Box 180
Sun City, CA 92586

***P9. Date Recorded:** 02/28/2014

***P10. Type of Survey:** X Intensive ___ Reconnaissance ___ Other
Describe:

***P11. Report Citation:** Cultural Resources Assessment of the Calimesa Creek Improvement Project, City of Calimesa, Riverside County, California byWhite & White 2014.

***Attachments:** ___ NONE X Map Sheet ___ Continuation Sheet X Building, Structure and Object Record ___ Linear Resource Record ___ Archaeological Record ___ District Record ___ Milling Station Record ___ Rock Art Record ___ Artifact Record ___ Photograph Record ___ Other (List):

See Office of Historic Preservation Recording Historical Resources for instructions.

BUILDING, STRUCTURE, AND OBJECT RECORD

See Office of Historic Preservation Recording Historical Resources for instructions.

Map Reference No.: N/A

***Resource Identifier:** Calimesa Creek-1 ***NRHP Status Code:** 6Z

B1. Historic Name: None

B2. Common Name: None **County/Route/Postmile:** N/A

B3. Original Use: Storm Drain **B4. Present Use:** Storm Drain

***B5. Architectural Style:** NA

***B6. Construction History:** Constructed in 1930 (dated). Builder unkown. Predates City of Calimesa incorporation (1990), Riverside County Flood Control and Water Conservation District (1938) as well as the Work(s) Progress Administartion (WPA) and Civilian Conservation Corps. (CCC) formed in 1935 and 1933 respectively.

***B7. Moved?** X No ___Yes ___Unknown **Date:** 1930 (factual) **Original Location:** Yes

***B8. Related Features** (describe below)**:**

Concrete tunnel (5-feet by 5-feet square) underneath Calimesa Boulevard to the east.

B9a. Architect: Unknown **B9b. Builder:** Unknown

***B10. Significance: Theme:** Flood Control **Area:** City of Calimesa, Riverside County

Period of Significance: 1930 **Property Type:** Engineering Structure **Applicable Criteria:** N/A

This structure was constructed for the sole purpose of conveying seasonal flows in Calimesa Creek beneath Calimesa Boulevard. It was constructed in 1930 using modern materials and techniques. It does not appear to meet any of the criteria for listing in the National Register of Historic Place (NRHP) or the California Register of Historical Resources (CRHR). It is not associated with any historic event (Criterion A) and there is no evidence indicating that that any of the people associates with the residence were prominent in national, state or local history (Criterion B). Consequently, we are left to consider the elements of Criterion (C) the "architectural" criterion which posits eligibility on the basis of style or artistic merit. The storm drain is not the work of a master architect or builder. Furthermore, it does not possess high artistic value and is not a distinctive example of any particular style. Under Criterion D, the storm drain is not likely to yield information about the history or prehistory of the area as this criterion primarily pertains to archaeological sites (see continuation sheet for further information).

B11. Additional Resource Attributes: HP11-Engineering Structure

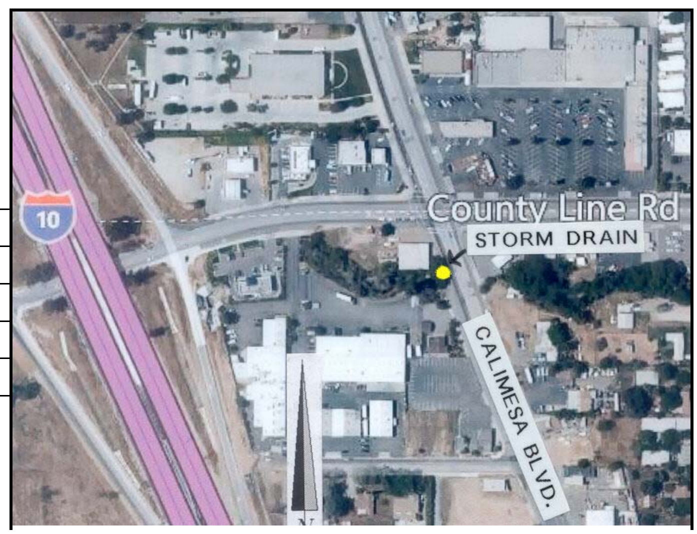
B12. References:

B13. Remarks:

Storm drain is operational and in good condition. There are no plans to demolish or modify the drain at this time.

B14. Evaluator: Robert S. White, Archaeological Associates, P.O. Box 180, Sun City, CA 92586

Date of Evaluation: February 28, 2014



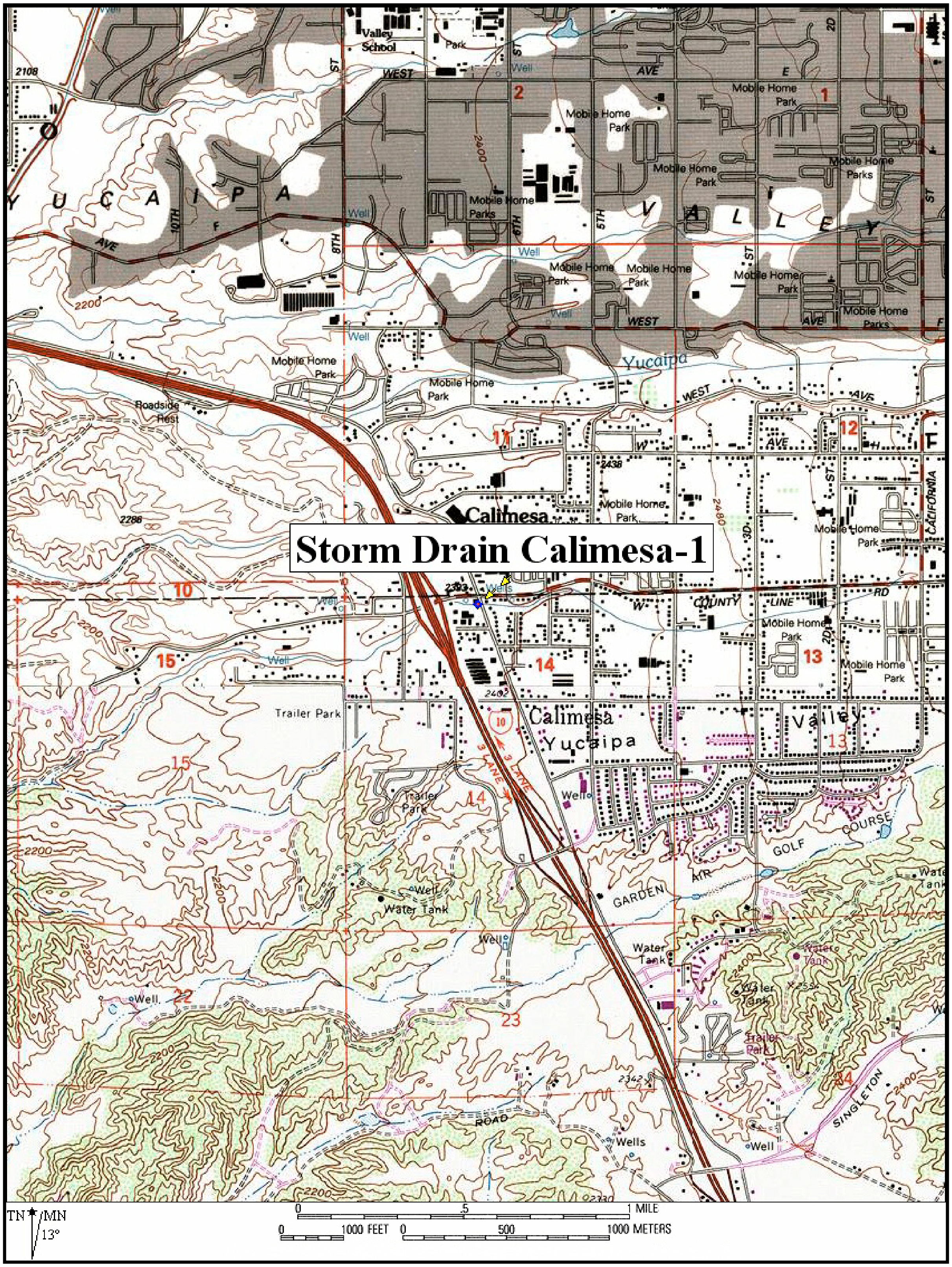
State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION	Primary #	P33-023900
	HRI#	
LOCATION MAP	Trinomial	

See Office of Historic Preservation Recording Historical Resources for instructions.

Resource Identifier: Climesa Creek Storm Drain **Caltrans Map Reference No.:** N/A

County/Route/Postmile: N/A

Map Name: Yucaipa 7.5’ *Scale: 1” = 2000 ft. *Date of Map: 1996



*Required information

Appendix D – Geotechnical Report

PRELIMINARY SOILS INVESTIGATION
CALIMESA CHANNEL BASIN
STAGE III
CALIMESA, CALIFORNIA

PROJECT NO. 63223.1
DECEMBER 20, 2019

Prepared For:

TKE Engineering, Inc.
2305 Chicago Avenue
Calimesa, California 92507

Attention: Mr. Steve Ledbetter

December 20, 2019

TKE Engineering, Inc.
2305 Chicago Avenue
Riverside, California 92507

Project No. 63223.1

Attention: Mr. Steve Ledbetter

Subject: Preliminary Soils Investigation, Calimesa Channel Basin, Stage III, Calimesa, California.

LOR Geotechnical Group, Inc., is pleased to present this report summarizing our preliminary soils investigation for the subject project. This report was based upon a scope of services generally outlined in our Work Authorization Agreement dated November 4, 2019 and other written and verbal communications.

In summary, it is our opinion that the proposed project is feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction.

LOR Geotechnical Group, Inc.

Table of Contents

Table of Contents

INTRODUCTION

During November and December of 2019, a Preliminary Soils Investigation was performed by LOR Geotechnical Group, Inc., for the proposed Calimesa Channel Basin, Stage III, in the City of Calimesa, California. The purpose of this investigation was to evaluate the subsurface conditions encountered in our exploratory borings and to provide geotechnical design recommendations for the proposed improvement. The scope of our services included:

- Review of available geotechnical literature, reports, maps, and agency information pertinent to the study area;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed project;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading design; and
- Preparation of this report summarizing our findings, and providing conclusions and recommendations for site development.

To orient our investigation at the site, a copy of the Site Plan, prepared by TKE Engineering, Inc., undated, was furnished for our use. The proposed locations of the improvements are indicated on this plan. The approximate locations of the site is shown on the attached Index Map, Enclosure A-1, within Appendix A.

The findings of our investigation, as well as our conclusions and recommendations, are presented in the following sections of this report.

PROJECT CONSIDERATIONS

It is our understanding that the site is proposed for a flood control basin. Approximately 25 feet of cut and 7 feet of fill is proposed to create the basin. A slope inclination of 2 horizontal to 1 vertical is proposed. Access to the basin will be provided by a road along the northern part of the basin. A storm drain inlet and outlet are proposed along the south side of the basin, connecting the basin to the adjacent Calimesa Channel.

It is also understood that the infiltration characteristics of the proposed basin have been evaluated by others.

EXISTING SITE CONDITIONS

The subject site is vacant and contains a light growth of grass and weeds.

FIELD INVESTIGATION

Our field exploration program was conducted on November 14, 2019, and consisted of drilling three exploratory borings with a truck-mounted Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers to approximate depths of 31.5 to 41 feet below the existing ground surface. The approximate locations of our exploratory borings are presented on the attached Site Plan, Enclosure A-2, within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. Relatively undisturbed and bulk samples were obtained at selected intervals and returned to our geotechnical laboratory in sealed containers for further testing and evaluation. A detailed description of the field exploration program and the boring logs are presented in Appendix B.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place density and moisture content, laboratory compaction characteristics, direct shear, and soluble sulfate content. A detailed description of the laboratory testing program and the test results are presented in Appendix C.

SUBSURFACE CONDITIONS

As indicated by our subsurface exploration, the project area is underlain by fill/topsoil materials followed by native alluvial materials. These units are described in further detail in the following section:

Fill/Topsoil*:* The existing surface contains fill/topsoil materials on the order of 2-feet in thickness. These materials were comprised of silty sand soils that were dry and in a loose in-place state. The fill/topsoil materials are most likely a result of past and current weed abatement practices at the site (discing).

Older Alluvium: Older alluvial materials were encountered underlying the fill materials described above to a maximum depth of approximately 41 feet in our boring B-1. The alluvial materials were variable, consisting of silty sand, clayey sand, sandy silt, well graded sand, and poorly graded sand. The older alluvial soils were typically light red brown in color and dry to damp. Based on our in-place density tests and equivalent Standard Penetration Test (SPT) blow counts, the older alluvial materials are in a medium dense to dense state upon first encounter, becoming dense to very dense with depth.

Groundwater was not encountered within our borings as explored to a maximum depth of approximately 41 feet.

The subsurface conditions encountered in our exploratory borings are indicative of the locations explored. It is not to be construed that these conditions are present the same throughout the site. A more detailed description of the subsurface soil conditions as encountered within our exploratory borings is presented on the Boring Logs, within Appendix B.

CONCLUSIONS

On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc., that the proposed improvements are feasible from a soil engineering standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

Based upon the field investigation and test data, it is our opinion that the existing fill/topsoil materials will not, in their present condition, provide uniform and/or adequate support for the proposed improvements. However, the existing older alluvial soils at a depth of approximately 2 feet below the existing surface are considered suitable to provide uniform and/or adequate support for the proposed improvements.

RECOMMENDATIONS

The following recommendations are provided for your assistance in establishing proper design, grading, and construction criteria:

General Site Grading

It is imperative that no clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An on-site, pre-job meeting with the client, the contractor, and soil engineer should occur prior to all grading related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusion of affected areas from the final compaction report for the project.

Grading of the subject site should be performed in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All uncontrolled fills encountered during site preparation should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. It is also our recommendation that any existing uncontrolled and/or undocumented fills under any proposed flatwork and paved areas be removed and replaced with engineered compacted fill. If this is not done, premature structural distress (settlement) of the flatwork and pavement may occur.

Cavities created by removal of subsurface obstructions should be thoroughly cleaned of loose soil, organic matter, and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Initial Site Preparation

All fill/topsoil materials should be removed from areas to receive engineered compacted fill. The data developed during this investigation indicates that removals on the order of 2 feet deep will be required to encounter competent older alluvium. Competent older alluvium is defined as damp, relatively dense soil with a minimum relative compaction of 85 percent (ASTM D 1557). The given removal depths are preliminary. The actual depths of removal should be determined during the grading operation by observation and in-place density testing.

Preparation of Fill Areas

Prior to placing fill and after conducting the removals discussed above, the surfaces of all areas to receive fill should be scarified to a depth of at least 6-inches.

The scarified soil should be brought to near optimum moisture content and compacted to a relative compaction of at least 90 percent (ASTM D 1557).

Engineered Compacted Fill

The on-site soils should provide adequate quality fill material, provided they are free from organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

Import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use.

Fill should be spread in maximum 8-inch loose lifts, each lift brought to near optimum moisture content, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

Slope Construction

A slope stability analysis was performed for the proposed approximately 30-foot high, 2H:1V slope for the basin. Shear strength data obtained during this investigation was applied for the materials encountered. Using the software program SLIDE 2018, the proposed condition revealed a static factor of safety of greater than 1.5. Using a Kh factor of 0.2, the proposed condition revealed a seismic factor of safety of greater than 1.0. The results of our analysis are provided in the Appendix D.

Slope Protection

Since the site soil materials are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces Dry side (exterior) slopes at the project should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the irrigation system and to prevent over watering. Wet side (interior) slopes may not be practical for such plantings. Routine maintenance of any such erosion should be expected.

Short-Term Excavations

Following the California Occupational and Safety Health Act (CALOSHA) requirements, excavations deeper than 5 feet should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements.

Short-term excavations greater that 5 feet deep shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based on our exploratory borings, it appears that Type C soil is the predominant type of soil on the project and all short-term excavations should be based on this type of soil. Deviation from the standard short-term slopes are permitted using Option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term slope construction and maintenance is the responsibility of the contractor, and should be a consideration of his methods of operation and the actual soil conditions encountered.

Sulfate Protection

The results of the sulfate tests conducted on selected subgrade soils expected to be encountered at foundation levels are presented in Appendix C.

Based on the results of our soluble sulfate tests, sulfate exposures of on site soils is considered negligible by the CBC. Therefore, no specific recommendations are given for concrete elements to be in contact with on site soils.

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed prior to construction to confirm that the intent of the recommendations presented herein have been incorporated into the design. Verification testing including soluble sulfates and expansion index should be performed during the site grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavation prior to backfilling.

3. Scarifying and recompacting prior to fill placement.

4. Placement of engineered compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by TKE Engineering, Inc. and their design consultants, for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations, and a surficial site reconnaissance. The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc., provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than indicated by this report, please contact this office immediately in order that we might evaluate their effect.

Should you have any questions regarding this report, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

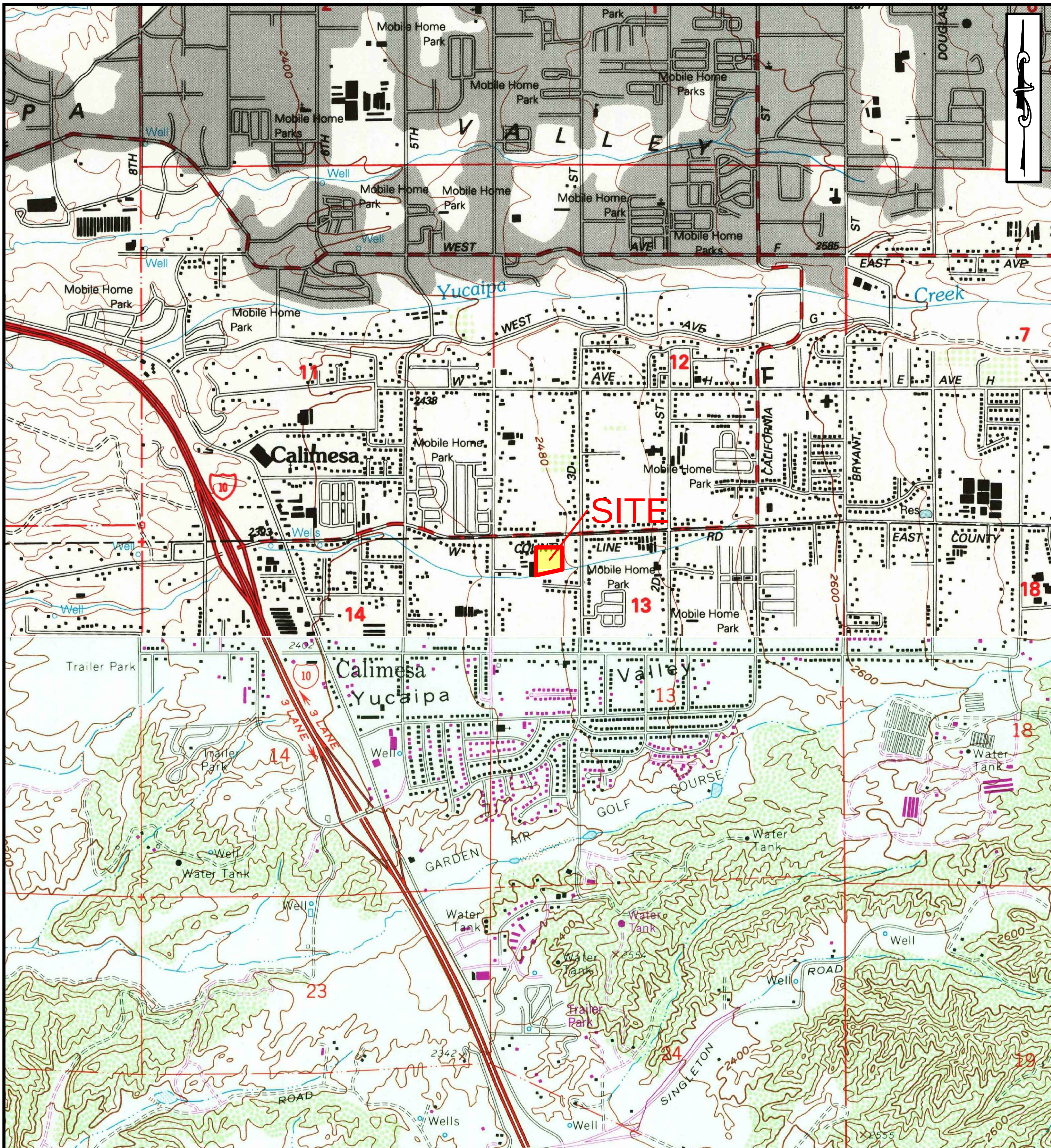
John P. Leuer, GE 2030
President

AAT:JPL:ss

Distribution: Addressee (4) and via email: sledbetter@tkeengineering.com

APPENDIX A

Index Map, Site Plan and Cross Section



INDEX MAP

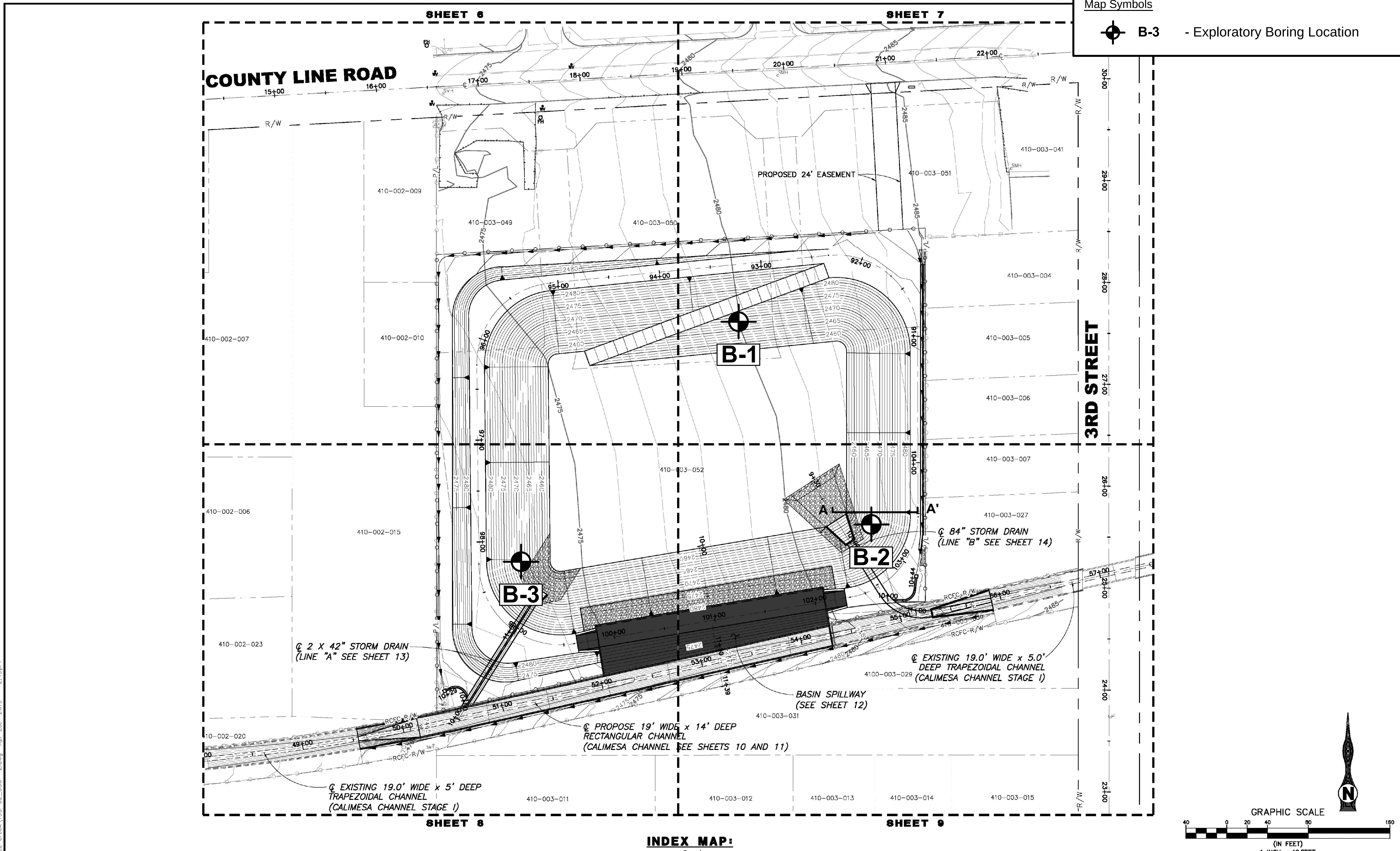
PROJECT:	CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA	**PROJECT NO:**	63223.1
CLIENT:	TKE ENGINEERING	**ENCLOSURE:**	A-1
LOR Geotechnical Group, Inc.		**DATE:**	DECEMBER 2019
		SCALE:	1" = 2,000'

Legend

(Locations Approximate)

Map Symbols

B-3 - Exploratory Boring Location



811 Know what's below. Call before you dig.

PERMANENT BENCH MARK
B.M. NO. C-33
AT THE SOUTHWEST CORNER OF CALIMESA BLVD, 15' S/O AVE. K, 10' N/O THE NE COR. OF A BLOCK BLDG., 3' N OF A DRINKING FOUNTAIN, A BRASS DISC IN CONC. POST MARKED C-33-65
2399.591 EL.

REF.	REVISIONS DESCRIPTION	APPR.	DATE

REGISTERED PROFESSIONAL ENGINEER STEVEN W. LEDBETTER No.84044 Exp.9-30-19 CIVIL STATE OF CALIFORNIA

TKE ENGINEERING, INC.
2305 CHICAGO AVENUE
RIVERSIDE, CA 92507
(951) 680-0440
(951) 680-0490 FAX
STEVEN W. LEDBETTER R.C.E. No. 84044 EXPIRES: 9-30-19

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DESIGNED BY: O. PARADA
DRAWN BY: J. VARTINEZ
DATE DRAWN: APRIL 2019
CHECKED BY: S. LEDBETTER

RECOMMENDED FOR APPROVAL BY: DESIGN ENGINEER R.E. No. 69984 DATE:
APPROVED BY: CHIEF ENGINEER R.E. NO. XXXXX DATE:

CALIMESA CHANNEL BASIN STAGE III
KEY MAP FOR STORM DRAIN AND BASIN PLAN

PROJECT NO. 0-0-0000
DRAWING NO. GP-01
SHEET NO. 5 OF 18

SITE PLAN

PROJECT: CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA

CLIENT: TKE ENGINEERING

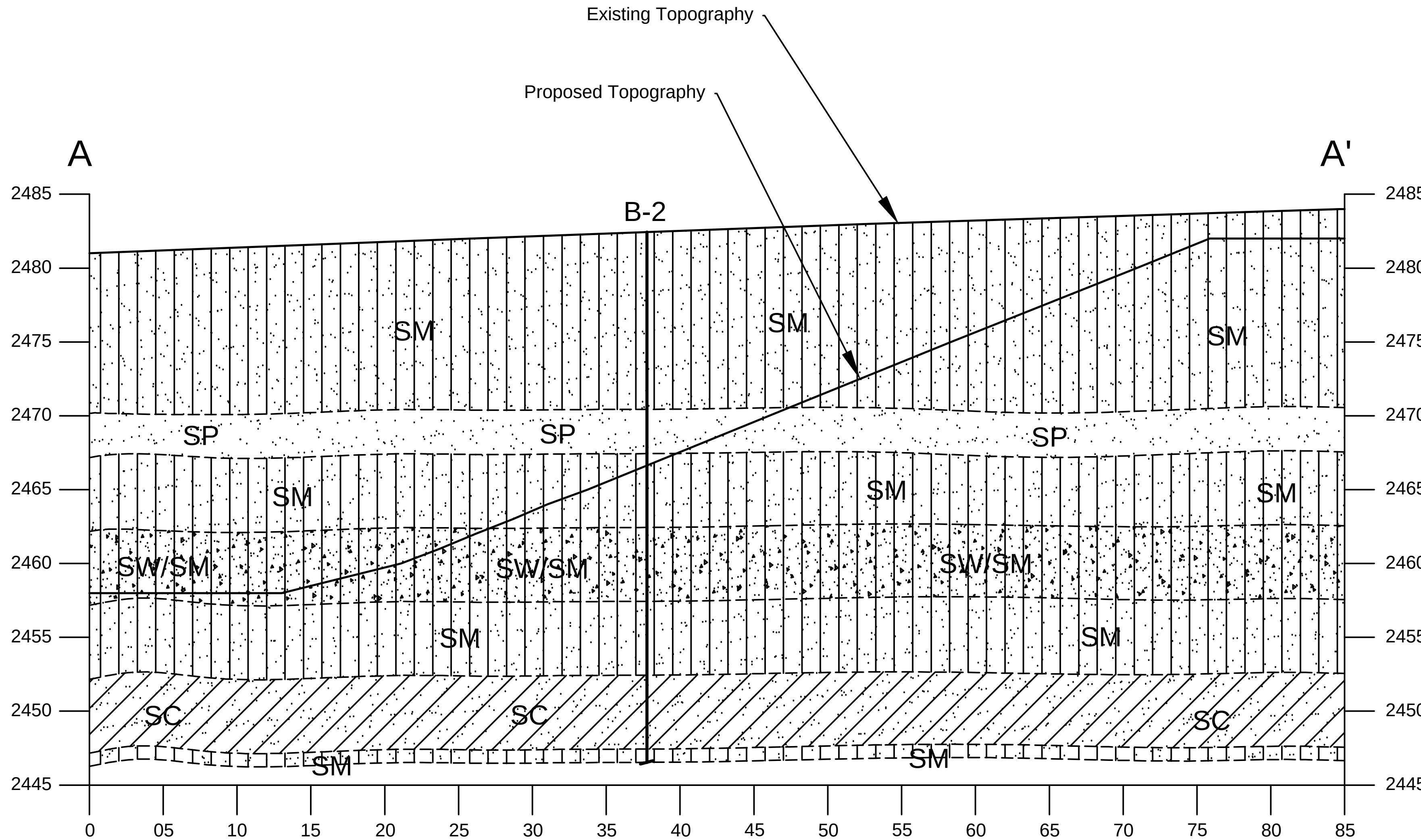
PROJECT NO: 63223.1

ENCLOSURE: A-2

DATE: DECEMBER 2019

SCALE: 1" ≈ 90'

LOR Geotechnical Group, Inc.



CROSS SECTION A-A'

PROJECT: CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA

CLIENT: TKE ENGINEERING

PROJECT NO: 63223.1

ENCLOSURE: A-3

DATE: DECEMBER 2019

SCALE: 1" = 10' (H=V)

LOR Geotechnical Group, Inc.

APPENDIX B

Field Investigation Program and Boring Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

The site was investigated on December 18, 2019 and consisted of advancing three exploratory borings to depths of approximately 31.5 and 41 feet below the existing ground surface. The approximate locations of the borings are shown on Enclosure A-2, within Appendix A.

The exploration was conducted using a truck-mounted Mobile B-61 drill rig equipped with a 8-inch diameter hollow stem augers. The soils were continuously logged by our geologist who inspected the site, created detailed logs of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a maximum interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50-inch inside diameter and 3.25-inch outside diameter or a Standard Penetration Test (SPT) driven by a 140-pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to equivalent SPT N-values. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-3.

The soil samples obtained using the California split barrel sampler were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed plastic containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our geotechnical laboratory for storage and testing. Detailed logs of the borings are presented on the enclosed Boring Logs, Enclosures B-1 through B-3. A Boring Log Legend and Sampling Key are presented on Enclosures B-I and B-ii, respectively.

CONSISTENCY OF SOIL

SANDS

SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol	Description
■	INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE
	INDICATES BULK SAMPLE
	INDICATES SAND CONE OR NUCLEAR DENSITY TEST
	INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1	Atterberg Limits
2	Consolidation
3	Direct Shear (undisturbed or remolded)
4	Expansion Index
5	Hydrometer
6	Organic Content
7	Proctor (4", 6", or Cal216)
8	R-value
9	Sand Equivalent
10	Sieve Analysis
11	Soluble Sulfate Content
12	Swell
13	Wash 200 Sieve

BORING LOG LEGEND

PROJECT:	**CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA**	**PROJECT NO.:**	**63223.1**
CLIENT:	**TKE ENGINEERING, INC.**	**ENCLOSURE:**	**B-i**
LOR Geotechnical Group, Inc.		**DATE:**	**DECEMBER 2019**

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS *MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE*	*GRAVEL AND GRAVELLY SOILS* *MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE*	*CLEAN GRAVELS (LITTLE OR NO FINES)*		GW	*WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES*
				GP	*POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES*
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	*SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES*
				GC	*CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES*
	SAND AND SANDY SOILS *MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE*	*CLEAN SANDS (LITTLE OR NO FINES)*		SW	*WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES*
				SP	*POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES*
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	*SILTY SANDS, SAND - SILT MIXTURES*
				SC	*CLAYEY SANDS, SAND - CLAY MIXTURES*
FINE GRAINED SOILS *MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE*	*SILTS AND CLAYS*	*LIQUID LIMIT LESS THAN 50*		ML	*INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY*
				CL	*INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS*
				OL	*ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY*
	SILTS AND CLAYS	*LIQUID LIMIT GREATER THAN 50*		MH	*INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS*
				CH	*INORGANIC CLAYS OF HIGH PLASTICITY*
				OH	*ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS*
HIGHLY ORGANIC SOILS				PT	*PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS*

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" No. 4 No. 10 No. 40 200

(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT	**CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA**	**PROJECT NO.**	**63223.1**
CLIENT:	**TKE ENGINEERING, INC.**	**ENCLOSURE:**	**B-ii**
LOR Geotechnical Group, Inc.		**DATE:**	**DECEMBER 2019**

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		3, 7, 11						SM	@ 0 feet, FILL/TOPSOIL: **SILTY SAND, approximately 15% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 25% silty fines, brown, dry, loose.**
	23		5.8		108.0				@ 2 feet, OLDER ALLUVIUM: **SILTY SAND, approximately 5% coarse grained sand, 15% medium grained sand, 35% fine grained sand, 45% silty fines, light red brown, damp, some pinhole porosity.**
5	37	3	7.0		111.3				**@ 5 feet, contains trace clay, remains porous.**
	18		15.3		112.7				**@ 7 feet, becomes moist, decrease in amount of porosity.**
10	32		12.1		117.1				
	31		7.6		113.3				**@ 12 feet, SILTY SAND, approximately 10% coarse grained sand, 30% medium grained sand, 35% fine grained sand, 25% silty fines, light red brown, damp.**
15	35		8.2		122.5				**@ 15 feet, SILTY SAND, trace gravel to 1", approximately 5% coarse grained sand, 35% medium grained sand, 40% fine grained sand, 20% silty fines, light red brown, damp.**
20	73		3.2		107.3			SP	**@ 20 feet, POORLY GRADED SAND, approximately 5% gravel to 1", 5% coarse grained sand, 30% medium grained sand, 55% fine grained sand, 5% silty fines, light red brown, dry.**
25	96		3.1					SW	**@ 25 feet, WELL GRADED SAND with GRAVEL, approximately 15% gravel to 2", 25% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 5% silty fines, light red brown, dry, rings disturbed.**
30	96 for 11"		9.4		126.0			SM	**@ 30 feet, SILTY SAND, approximately 10% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 40% silty fines, red brown, damp.**
35	74		13.8		121.6			ML	**@ 35 feet, SANDY SILT, approximately 10% coarse grained sand, 15% medium grained sand, 15% fine grained sand, 60% silty fines with trace clay, red brown, damp.**
40	92		6.4		109.6			SW SM	**@ 40 feet, WELL GRADED SAND with GRAVEL and SILT, approximately 15% gravel to 1", 20% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 10% silty fiens, speckled red brown, damp.**
									END OF BORING @ 41'
45									**Fill to 2'** **No groundwater** **No bedrock**

PROJECT:	**Calimesa Channel Basin Stage III**	PROJECT NUMBER:	**63223.1**
CLIENT:	**TKE Engineering, Inc.**	ELEVATION:	**2480**
LOR GEOTECHNICAL GROUP INC.		DATE DRILLED:	**November 14, 2019**
		EQUIPMENT:	**Mobile B-61**
		HOLE DIA.: **8"**	ENCLOSURE: **B-1**

LOG OF BORING B-2

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	U.S.C.S.	DESCRIPTION
0							SM	@ 0 feet, FILL/TOPSOIL: SILTY SAND, approximately 5% coarse grained sand, 15% medium grained sand, 40% fine grained sand, 40% silty fines, light brown, dry, loose.
	67		6.8		125.9	▮		@ 2 feet, OLDER ALLUVIUM: SILTY SAND, approximately 15% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 30% silty fines with trace of clay, red brown, damp, some pinhole porosity, some roothairs.
5	23		6.5		120.1	▮		@ 5 feet, trace gravel to 2", non-porous, no roothairs.
	15		14.6		116.9	▮		@ 7 feet, SILTY SAND, trace gravel to 1/2", approximately 15% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 30% silty fines with trace clay, red brown, moist, some pinhole and slightly larger porosity.
10	17		10.6		106.1	▮		@ 10 feet, SILTY SAND, approximately 15% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 25% silty fines, light red brown, damp.
	26	3	5.6		113.3	▮	SP	@ 12 feet, POORLY GRADED SAND, approximately 10% coarse grained sand, 35% medium grained sand, 50% fine grained sand, 5% silty fines, light red brown, damp.
15	34		13.5		111.9	▮	SM	@ 15 feet, SILTY SAND, approximately 10% coarse grained sand, 35% medium grained sand, 35% fine grained sand, 20% silty fines, light red brown, dry to damp to moist.
20	64		8.7		114.4	▮	SW SM	@ 20 feet, WELL GRADED SAND with SILT, approximately 30% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 10% silty fines, speckled red brown, damp.
25	68		11.6		111.3	▮	SM	@ 25 feet, SILTY SAND, approximately 5% coarse grained sand, 35% medium grained sand, 45% fine grained sand, 15% silty fines, light red brown, damp to moist.
30	64		10.2		127.1	▮	SC	@30 feet, CLAYEY SAND, approximately 20% coarse grained sand, 20% medium grained sand, 30% fine grained sand, 30% clayey fine of low plasticity, red brown, damp, trace thin calcite stringers, trace pinhole porosity.
35	77 for 11"		7.4		111.4	▮	SM	@ 35 feet, SILTY SAND, trace gravel to 1", approximately 20% coarse grained sand, 20% medium grained sand, 25% fine grained sand, 35% silty fines with trace clay, red brown, damp.
								END OF BORING @ 35.92'
40								Fill to 2' No groundwater No bedrock

PROJECT:	Calimesa Channel Basin Stage III	PROJECT NUMBER:	63223.1
CLIENT:	TKE Engineering, Inc.	ELEVATION:	2483
LOR GEOTECHNICAL GROUP INC.		DATE DRILLED:	November 14, 2019
		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	ENCLOSURE: B-2

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL/TOPSOIL: SILTY SAND, approximately 5% coarse grained sand, 20% medium grained sand, 40% fine grained sand, 35% silty fines, light brown, dry, loose.
	43		6.9		116.2				@ 2 feet, OLDER ALLUVIUM: SILTY SAND, appproximately 15% coarse grained sand, 20% medium grained sand, 20% fine grained sand, 45% silty fines with trace clay, red brown, damp, some roothairs, trace pinhole and slightly larger porosity.
5	35		9.3		115.0				@ 5 feet, SILTY SAND, approximtely 5% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 35% silty fines, red brown, damp, trace roothairs, trace pinhole porosity.
	19		15.1		114.3			SC	@ 7 feet, CLAYEY SAND, approximately 15% coarse grained sand, 20% medium grained sand, 20% fine grained sand, 45% clayey fines of low plasticity, damp, some porosity.
10	15	3	16.7		107.7			SM	@ 10 feet, SILTY SAND, approximately 10% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 30% silty fines, lght red brown, moist, porous.
	27		14.5		113.7				@ 12 feet, becomes slightly finer grained, remains porous.
15	49	3	5.0		116.0			SW	@ 15 feet, WELL GRADED SAND with GRAVEL, approximately 15% gravel to 1.5", 25% coarse grained sand, 25% medium grained sand, 30% fine grained sand, 5% silty fines, speckled red brown, dry.
20	56		4.3		121.2			SM	@ 20 feet, SILTY SAND, approximately 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, light red brown, dry.
25	76		3.5					SW	@ 25 feet, WELL GRADED SAND, trace gravel to 3/4", approximately 25% coarse grained sand, 35% medium grained sand, 35% fine grained sand, 5% silty fines, light red brown, dry, rings disturbed.
30	54		9.1		123.1			SM	@ 30 feet, SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 20% silty fines, red brown, damp, trace pinhole porosity.
									END OF BORING @ 31.5' Fill to 2' No groundwater No bedrock
35									

PROJECT:	Calimesa Channel Basin Stage III	PROJECT NUMBER:	63223.1
CLIENT:	TKE Engineering, Inc.	ELEVATION:	2476
		DATE DRILLED:	November 14, 2019
LOR GEOTECHNICAL GROUP INC.		EQUIPMENT:	Mobile B-61
		HOLE DIA.: 8"	ENCLOSURE: B-3

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from the borings were tested in our laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included in-place moisture content and dry density, laboratory compaction, direct shear, and soluble sulfate tests. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture-Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined for selected undisturbed samples, in accordance with ASTM D 2937 and ASTM D 2216, respectively, and the results are shown on the boring logs, Enclosures B-1 through B-3, for convenient correlation with the soil profile.

Laboratory Compaction

Selected soil samples were tested in the laboratory to determine compaction characteristics using the ASTM D 1557-02 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION

Boring Number	**Sample Depth (feet)**	**Soil Description U.S.C.S.**	Maximum Dry Density (pcf)	Optimum Moisture Content (percent)
B-1	1-4	(SM) Silty Sand	131.5	7.5

Direct Shear Tests

Shear tests are performed, in accordance with ASTM D 3080, with a direct shear machine at a constant rate-of-strain (usually 0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear. Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in an undisturbed (u) or remolded (r) state (90% relative compaction per ASTM 1557) and soaked, to represent the worst-case conditions expected in the field.

The results of the shear tests are presented in the following table:

DIRECT SHEAR TESTS				
Boring Number	**Sample Depth (feet)**	**Soil Description U.S.C.S.**	**Angle of Internal Friction (degrees)**	**Apparent Cohesion (psf)**
B-1	1-4 (r)	(SM) Silty Sand	23	372
B-1	5 (u)	(SM) Silty Sand	35	156
B-2	12 (u)	(SP) Poorly Graded Sand	33	300
B-3	10 (u)	(SM) Silty Sand	23	120
B-3	15 (u)	(SW) Well Graded Sand	40	96

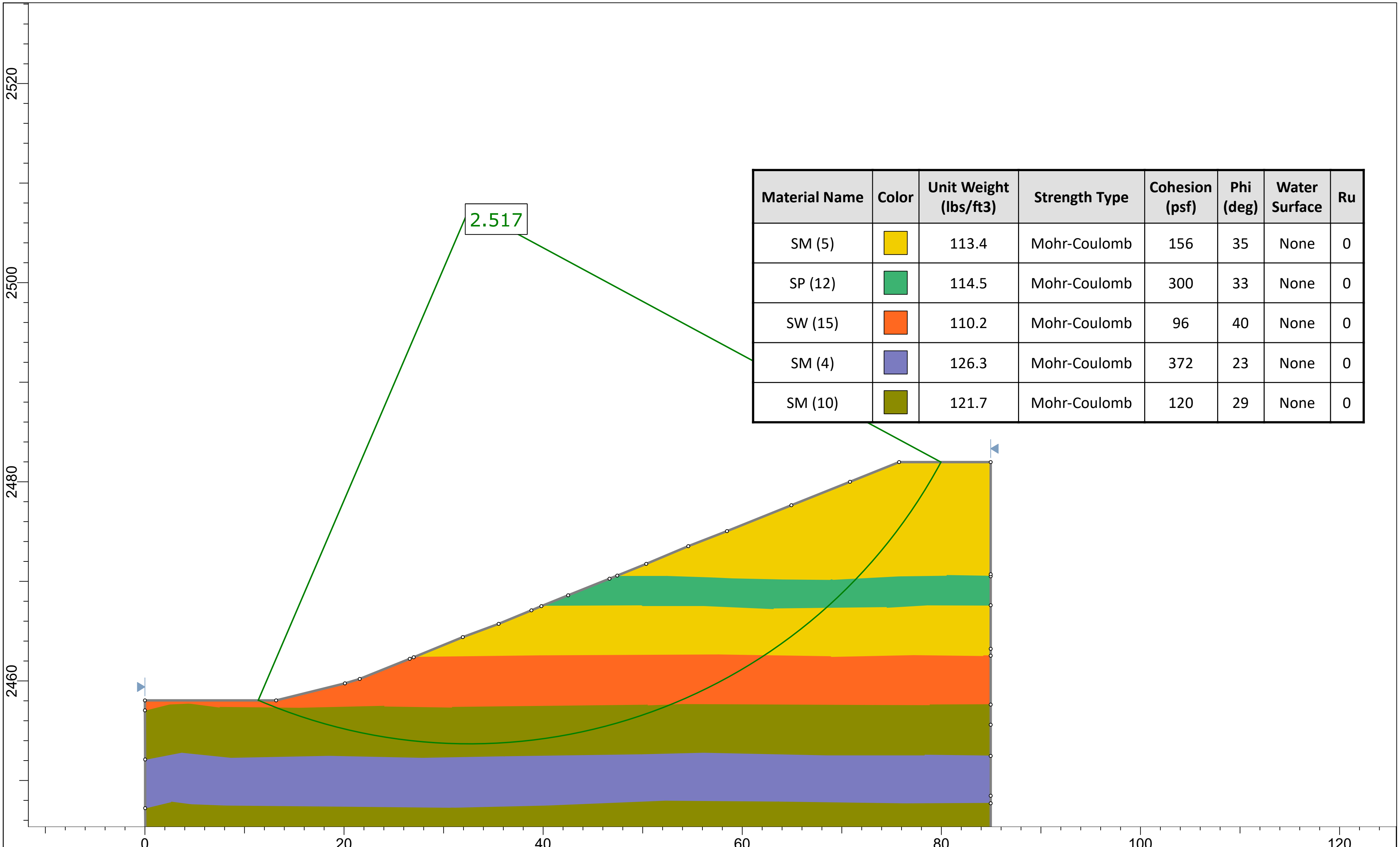
Soluble Sulfate Content Tests

The soluble sulfate content of selected subgrade soils were evaluated. The concentration of soluble sulfates in the soils was determined by measuring the optical density of a barium sulfate precipitate. The precipitate results from a reaction of barium chloride with water extractions from the soil samples. The measured optical density is correlated with readings on precipitates of known sulfate concentrations. The test results are presented on the following table:

SOLUBLE SULFATE CONTENT TESTS			
Boring Number	**Sample Depth (feet)**	**Soil Description**	**Sulfate Content (% by weight)**
B-1	1-4	(SM) Silty Sand	<0.005

APPENDIX D

Slope Stability



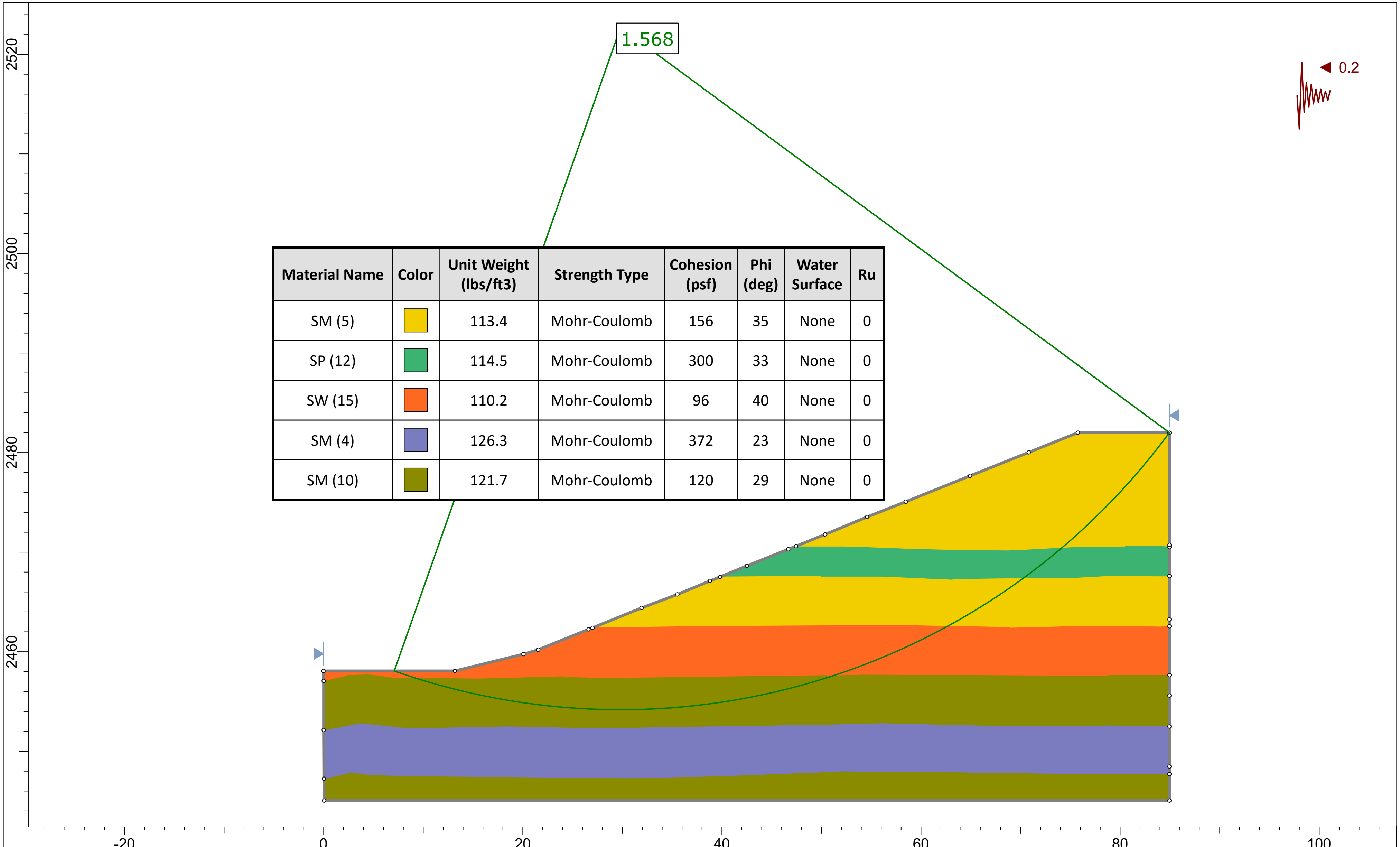
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
SM (5)		113.4	Mohr-Coulomb	156	35	None	0
SP (12)		114.5	Mohr-Coulomb	300	33	None	0
SW (15)		110.2	Mohr-Coulomb	96	40	None	0
SM (4)		126.3	Mohr-Coulomb	372	23	None	0
SM (10)		121.7	Mohr-Coulomb	120	29	None	0

rocscience

SLIDEINTERPRET 8.029

Project	Calimesa Channel Basin Stage III
Analysis Description	Group 1
Drawn By	
Scale	1:160
Company	LOR Geotechnical
Date	12/18/19
File Name	Slide1.slmd

Enclosure D-1



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
SM (5)		113.4	Mohr-Coulomb	156	35	None	0
SP (12)		114.5	Mohr-Coulomb	300	33	None	0
SW (15)		110.2	Mohr-Coulomb	96	40	None	0
SM (4)		126.3	Mohr-Coulomb	372	23	None	0
SM (10)		121.7	Mohr-Coulomb	120	29	None	0

rocscience

SLIDEINTERPRET 8.029

Project	Calimesa Channel Basin Stage III
Analysis Description	Group 1
Drawn By	
Scale	1:160
Company	LOR Geotechnical
Date	12/18/19
File Name	Slide1.slmd

Enclosure D-2

January 29, 2020

TKE Engineering, Inc.
2305 Chicago Avenue
Riverside, California 92507

Project No. 63223.11

Attention: Mr. Steve Ledbetter

Subject: Supplemental Geotechnical and Geologic Information, Calimesa Channel Basin, Stage III, Calimesa, California.

As requested, we have prepared this letter containing supplemental geotechnical and geologic information as related to our previous investigation conducted for the proposed Calimesa Channel Basin, Stage III, located in the City of Calimesa, California (LOR, 2019).

Regional Geologic Setting

The subject site is located along the junction of two major geomorphic provinces of southern California, or at the end of the Peninsular Ranges geomorphic province where it meets the Transverse Ranges geomorphic province. The Peninsular Ranges include a series of small northwestern trending mountains, separated by wide flat valleys, that extend from the Los Angeles region southeastward into Baja, California. The northern margin of this province butts up against a series of mountain ranges that lie in a transverse direction to the normal northwestern trend, or extend east and west. These mountains include the Santa Monica Mountains, the San Gabriel Mountains, and the San Bernardino Mountains that lie just north and east of the city of Calimesa. In the Calimesa locality, these two major provinces are termed the Peninsular Ranges Block to the south and the San Bernardino Mountains Block to the north and are separated by a series of complex faults known collectively as the San Andreas Fault Zone. In this tectonically complex area, the Peninsular Ranges Block is generally sliding to the northwest, and partially thrusted underneath the San Bernardino Mountains Block. Therefore, the resulting faults end up with a complex mix of strike slip and thrust faults.

The San Andreas fault, which lies approximately 7.5 kilometers (4.7 miles) to the northeast, acts as the boundary between the Peninsular and Transverse Ranges provinces. The next largest active fault in the region, in terms of total movement and anticipated magnitudes, is the San Jacinto fault which lies approximately 9.4 kilometers (5.8 miles) to the southwest. This fault has similar motions to the San Andreas or right lateral strike slip.

While the trend of the San Andreas fault is predominately a relatively straight line across much of California, in the area just north of Indio, the San Andreas fault has an approximately 15-mile wide step-over zone, stepping to the west and cutting across the San Gorgonio Pass then up to the eastern end of the city of Yucaipa. Beyond this to the northwest, the trend of the fault once again resumes a northwesterly course. This twisting motion has resulted in a complex tectonic setting in the region between the San Andreas and the San Jacinto faults, that is not as yet completely understood. However, in general, the result of this geometry is that along the San Gorgonio pass and up into the Yucaipa region the motion changes from right lateral strike slip to thrusting. Within the Calimesa-Yucaipa region, this complex motion has resulted in several types of motions, extension with tectonic activity, including essentially all types of fault motions, from right lateral strike slip, or horizontal, to thrusting and normal, or tensional faulting along a numerous series of smaller fault splays.

One of the largest of these smaller splays is the Banning fault, lying along the base of the San Bernardino Mountains and situated approximately 2,100 feet to the southwest of the site. This fault appears to be the dominate thrust in the western end of the pass, joining the San Gorgonio Pass Fault Zone to the east with the motion changing to strike slip.

Therefore, the topography of the land in this region has been drastically altered by differing tectonic forces, which have resulted in the uplifting of the region east of the site. The bedrock materials underlying the region of the small hills to the east of Calimesa are composed of a complex mix of metamorphic rocks of gneiss, schist, phyllite, and meta-igneous rocks of meta-diorite to meta-granotoid rocks. These rocks are very similar in composition to the basement rocks of the far southeastern end of the San Bernardino Mountains Block.

As noted above, the closest known potentially active fault in relation to the subject site is the Banning fault, located approximately 0.8 kilometers (0.5 miles) to the southwest, while the much larger, active, San Andreas fault is located approximately 7.5 kilometers (4.7 miles) to the northeast. A complete listing of the distances to known active faults in relation to the site is given in the Faulting section of this letter.

The regional geology as mapped by the U.S.G.S. (Mattti and Morton, 2010 and Matti et al, 2003) and partial legend is shown on Enclosure 1,attached.

Site Geologic Conditions

As noted above and our previous investigation, the site is underlain by a thin layer of fill/topsoil materials followed by older alluvial soils (LOR, 2019, Matti et al, 2003).

Fill/Topsoil:

During our previous investigation, the existing surface of the site contains fill/topsoil materials on the order of 2-feet in thickness (LOR, 2019). These materials were comprised of silty sand soils that were dry and in a loose in-place state. The fill/topsoil materials are most likely a result of past and current weed abatement practices at the site (discing).

Older Alluvium:

Older alluvial materials were encountered underlying the fill materials described above to a maximum depth of approximately 41 feet (LOR, 2019). The older alluvial materials were variable, consisting of silty sand, clayey sand, sandy silt, well graded sand, and poorly graded sand. The older alluvial soils were typically light red brown in color and dry to damp. Based on our in-place density tests and equivalent Standard Penetration Test (SPT) blow counts, the older alluvial materials are in a medium dense to dense state upon first encounter, becoming dense to very dense with depth.

Groundwater Hydrology

Groundwater was not encountered within our exploratory borings advanced to a maximum depth of approximately 41 feet beneath the existing ground surface.

Records for nearby wells which were readily available from the State of California Department of Water Resources online database was reviewed as a part of this investigation.

According to the State of California Department for Water resources online database, the nearest well is State Well Number 02S02W12M001S located approximately 0.9 kilometers (0.5 miles) north-northwest of the site. Data for this well was present from December of 1926 to June of 2018. Groundwater depths over 200 feet were reported during that time. A measuring point elevation of 2,477 feet above mean sea level was provided.

Another nearby well according to the State of California Department for Water resources online database, the nearest well is State Well Number 02S02W14J002S located approximately 1.1 kilometers (0.7 miles) southwest of the site. Data for this well was present from June of 1998 to October of 2010. Groundwater depths slightly over 150 feet were reported during that time. A measuring point elevation of 2,418 feet above mean sea level was provided.

The proposed bottom elevation of the basin is 2,457 feet above mean sea level. Based on the groundwater data above, groundwater lies at a depth of just under 200 feet at the site.

Mass Movement

The site lies on a relatively flat surface. Mass movement failures such as landslides, rockfalls, or debris flows within the site vicinity are not known to exist and no evidence of mass movement was observed on the site.

Faulting

There are no known active faults at the site. In addition, according to the Official Maps of Alquist-Priolo Earthquake Fault Zones of California (Hart and Bryant, 1997) the subject site does not lie within a current State of California Earthquake Fault Zone.

As previously noted, the subject site lies near the middle of a large wedge shaped area in between the San Jacinto fault, located approximately 9.4 kilometers (5.8 miles) to the southwest and the San Andreas, which lies approximately 7.5 kilometers (4.7 miles) to the northeast. Both of these faults are considered to be major active faults which move in a lateral fashion with the northwest portions offset to the southeast during earthquakes. This type of motion is called right lateral strike slip. The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific plate and the North American plate. While estimates vary, the San Andreas fault is generally thought to have an average slip range on the order of 24 mm/yr and capable of generating large magnitude events on the order of 7.5 or greater.

The San Jacinto fault zone is a sub-parallel branch of the San Andreas fault zone, extending from the northwestern San Bernardino area, southward into the El Centro region. It is believed that the San Jacinto fault zone has an average slip rate of about 12 mm/year and is capable of producing an earthquake magnitude on the order of 6.5 or greater.

Lying in between these two faults are numerous smaller faults with varying types of motion. Perhaps the largest of these, based on length and estimated amounts of past displacement, in the region around the site is the Banning fault.

Based on mapping conducted by the USGS, the Banning fault bifurcates off of the San Andreas fault just north of Indio, then extends through the Banning-Beaumont pass area and into the Calimesa area. While some reports claim that the Beaumont fault has been inactive since earliest Pleistocene time (1.8 million years ago), the State of California has placed the Calimesa portion of the Banning fault within an Earthquake Fault Zone on their maps of the Alquist-Priolo Earthquake Fault Zones of California. According to mapping by others, at its closest approach the Banning fault lies approximately 2,100 feet southwest of the subject site (Matti and Morton, 2010 and Matti, et al, 2003).

Another known active fault is the Chicken Hill fault located approximately 3.7 kilometers (2.3 miles) to the northwest.

The Chicken Hill fault is considered part of numerous faults collectively called the Crafton Hills Complex. The Crafton Hills Complex is comprised of numerous intra faults created by the interaction of the San Andreas fault to the northeast and the San Jacinto fault to the southwest which are poorly understood. The possible earthquake magnitude and recurrence interval of this fault system is not known.

Current standards of practice included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. However, while there are other large earthquake faults within a 100 kilometer (62 mile) radius of the site, none of these are considered as relevant to the site as the faults described above, due to their greater distance and smaller anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region, a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the online historical seismic search catalog of the U.S.G.S. (2020). This program conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto an overlay map of known faults. For this investigation the database of seismic events utilized by the program was obtained from the Southern California Seismic Network (SCSN) available from the Southern California Earthquake Center. At the time of our search the data base contained data from January 1, 1932 through January 26, 2020.

In our first search, the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile)radius of the site, in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As depicted on Enclosure 2, within Appendix A, the site lies within a relatively active region associated with the San Andreas fault trending northwest and the northwest trending faulting of the Mojave Desert geomorphic province. The 7.3 magnitude Landers earthquake and associated aftershocks including the 6.4 magnitude Big Bear earthquake are illustrated on this map, located to the northeast of the site. In addition, the 7.1 magnitude Hector Mine earthquake is also illustrated.

In the second search, the micro seismicity of the area lying within a 10 kilometer (62 mile) radius of the site was examined by selecting an epicenter map listing events on the order of 1.0 and greater since 1978. The results of this search is a map that presents the seismic history around the area of the site with much greater detail, not permitted on the larger map. The reason for limiting the events to the last 40 ± years on the detail map is to enhance the accuracy of the map. Events recorded prior the mid 1970's are generally considered to be less accurate due to advancements in technology. As depicted on this map, Enclosure 3, the San Andreas and San Jacinto fault zones appear to be the source of numerous events.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring around the subject site, predominately associated with the presence of the San Andreas and San Jacinto fault zones. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seiches and tsunamis, earthquake induced flooding, landsliding and rockfalls, and seismic-induced settlement.

Liquefaction: The potential for liquefaction generally occurs during strong ground shaking within loose granular sediments where the depth to groundwater is usually less than 50 feet. As the site is underlain by relatively medium dense to dense older alluvial materials and the depth to groundwater is thought to be in excess of 50 feet, the possibility of liquefaction at the site is considered nil.

Seiches/Tsunamis: The potential for the site to be affected by a seiche or tsunami (earthquake generated wave) is considered nil due to absence of any large bodies of water near the site.

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or near the site which could possibly rupture during an earthquake and affect the site by flooding.

Seismically-Induced Landsliding: Due to the low relief of the site and surrounding region, the potential for landslides to occur at the site is considered nil.

Rockfalls: No large, exposed, loose or unrooted boulders are present above the site that could affect the integrity of the site.

Seismically-Induced Settlement: Settlement generally occurs within areas of loose, granular soils with relatively low density. Since the site is underlain by relatively medium dense to dense older alluvial materials, the potential for settlement is considered low. In addition, the earthwork operations recommended to be conducted during the development of the site will mitigate any near surface loose soil conditions (LOR, 2019).

Soil Expansiveness

As noted by our previous report, the majority of the site surficial soils consist of silty sands, minor units of well graded sand and poorly graded sand, and trace units of clayey sand and sandy silt. The granular units of silty sand, well graded sand, and poorly graded sand are considered to have a very low expansion potential. The finer grained units of clayey sand and sandy silt are anticipated to have very low to low expansion potential.

CLOSURE

Should you have any questions regarding the contents of this letter, please do not hesitate to contact us as your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

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Attachments:	Regional Geologic Map, Enclosure 1 Historical Seismicity, Enclosures 2 and 3
Distribution:	Addressee (2) and via email sledbetter@tkeengineering.com

REFERENCES

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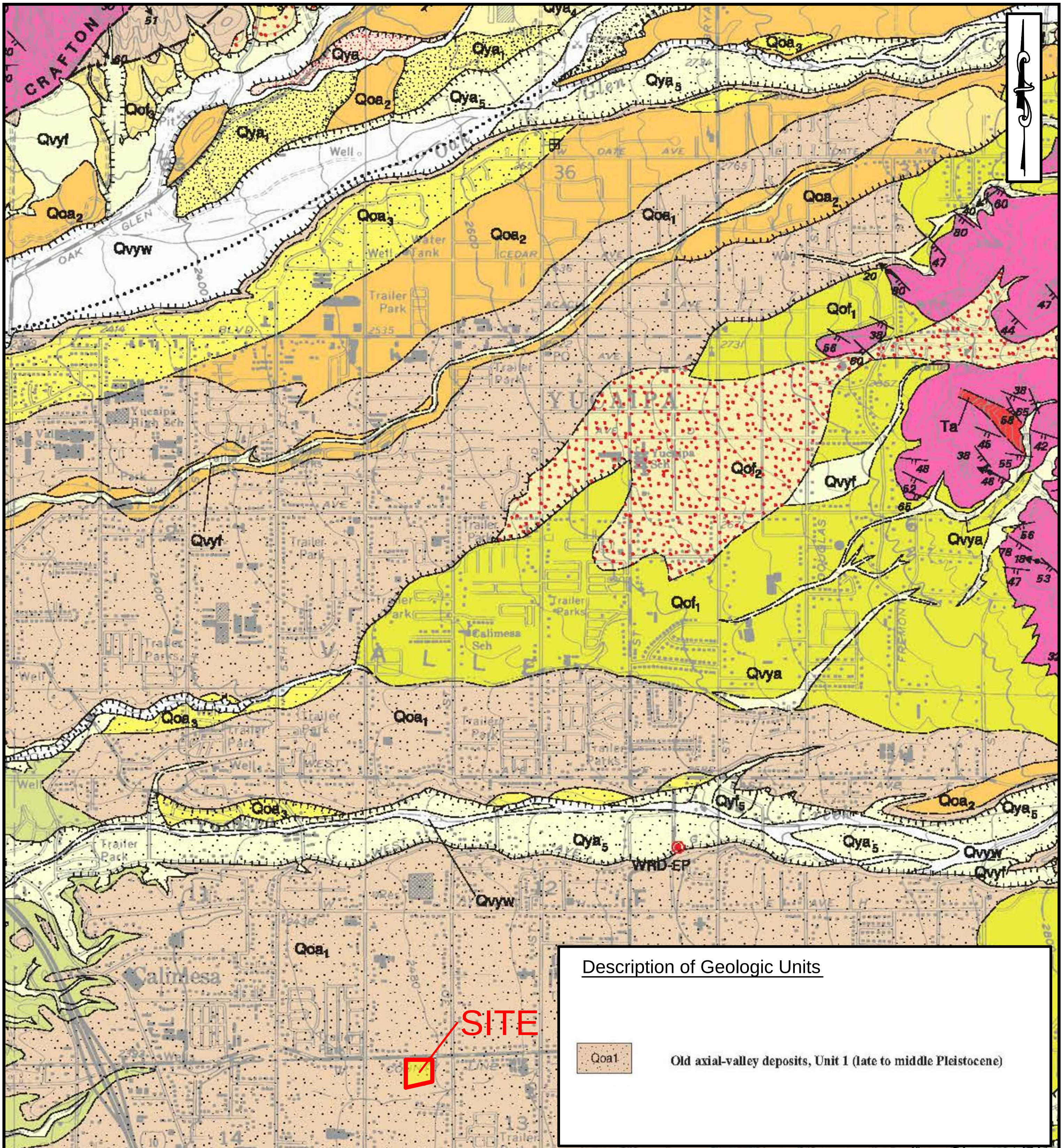
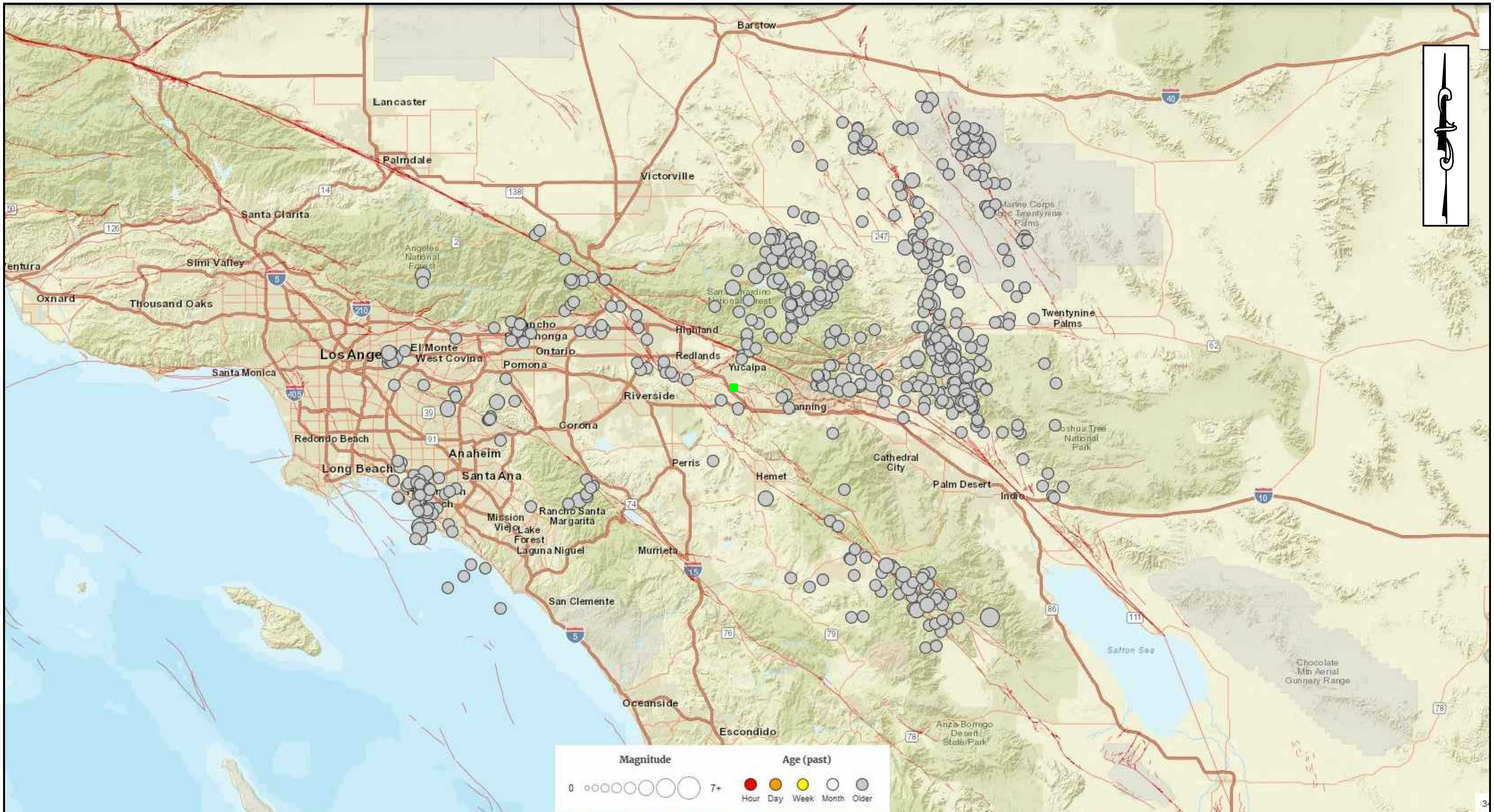
USGS, 2020, https://earthquake.usgs.gov/earthquakes/map/.



REGIONAL GEOLOGIC MAP

(Matti & Morton, 2003)

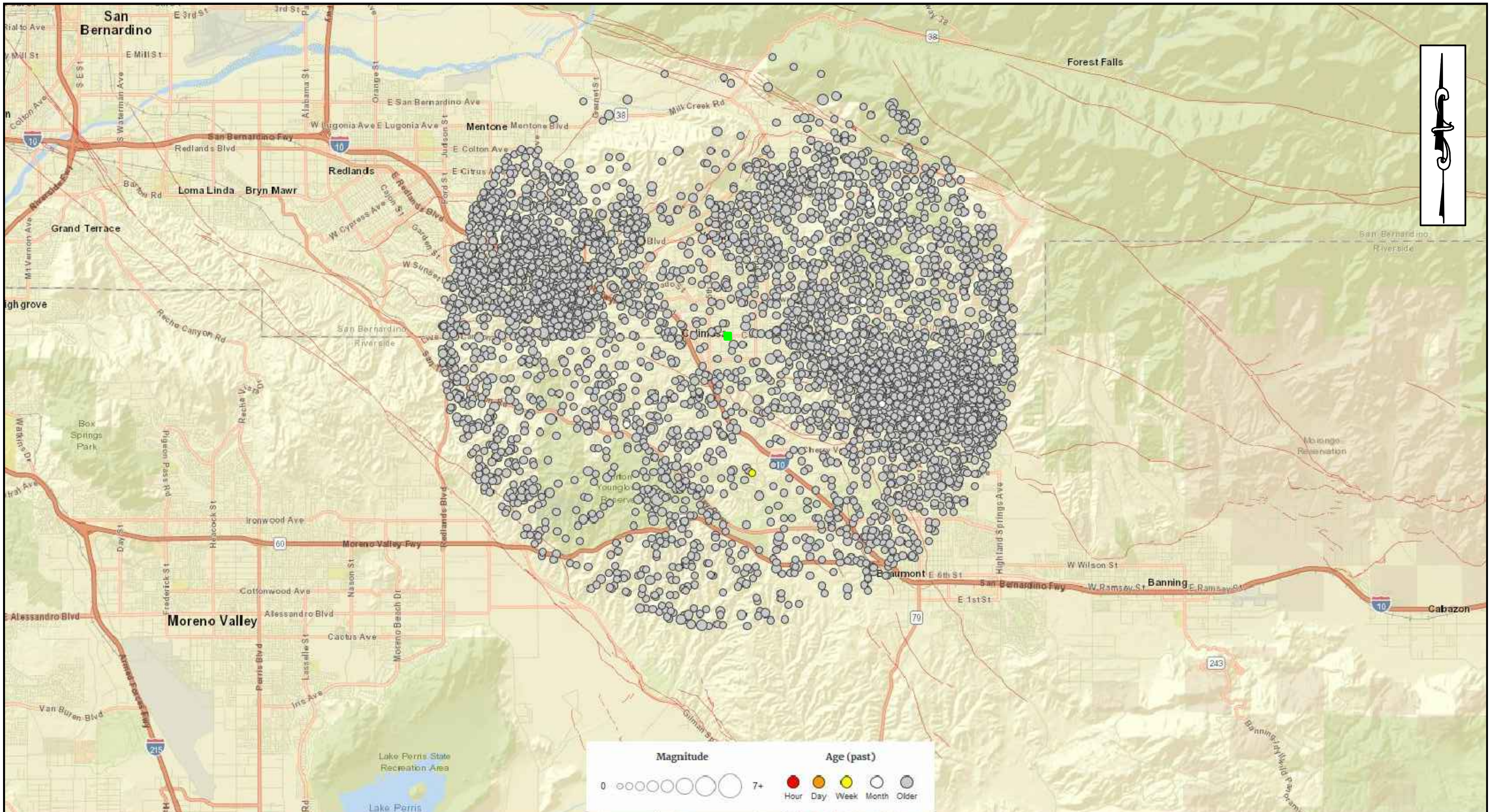
PROJECT:	CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA	**PROJECT NO:**	63223.11
CLIENT:	TKE ENGINEERING	**ENCLOSURE:**	1
LOR Geotechnical Group, Inc.		**DATE:**	JANUARY 2020
		SCALE:	1" = 2,000'



U.S. Geologic Survey (2017a) real-time earthquake epicenter map. Plotted are 572 epicenters of instrument-recored events from 1932 to present (01/26/20) of local magnitude greater than M4.0 within a radius of ~62 miles (100 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These evens are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 100km Radius

PROJECT:	CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA	**PROJECT NO:**	63223.11
CLIENT:	TKE ENGINEERING	**ENCLOSURE:**	2
LOR Geotechnical Group, Inc.		**DATE:**	JANUARY 2020
		SCALE:	1" ≈ 40km



U.S. Geologic Survey (2017a) real-time earthquake epicenter map. Plotted are 4,847 epicenters of instrument-recored events from 1978 to present (01/26/20) of local magnitude greater than M1.0 within a radius of ~6.2 miles (10 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 10km Radius

PROJECT:	CALIMESA CHANNEL BASIN STAGE III, CALIMESA, CALIFORNIA	**PROJECT NO:**	63223.11
CLIENT:	TKE ENGINEERING	**ENCLOSURE:**	3
LOR Geotechnical Group, Inc.		**DATE:**	JANUARY 2020
		SCALE:	1" ≈ 4km

Appendix E – Phase I, Environmental Site Assessment

PHASE I ENVIRONMENTAL SITE ASSESSMENT
PROPOSED CALIMESA CHANNEL BASIN STAGE III
4.6± ACRES OF VACANT LAND
PORTIONS OF APNs 410-030-049 THROUGH -052
CALIMESA
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO. 63592.2
DECEMBER 5, 2019

Prepared For:

TKE Engineering, Inc.
2305 Chicago Avenue
Riverside, CA 92507

Attention: Mr. Steve Ledbetter, PE

December 5, 2019

TKE Engineering, LLC
2305 Chicago Avenue
Riverside, CA 92507

Project No. 63592.2

Attention: Mr. Steve Ledbetter, PE

Subject: Phase I Environmental Site Assessment
Proposed Calimesa Channel Basin Stage III
4.6± Acres of Vacant Land
Portions APNs 410-030-049 through -052
Calimesa, Riverside County, California

Attached herewith is the Phase I Environmental Site Assessment (ESA) conducted by this firm for the subject site located in Calimesa, California.

This Phase I ESA was planned and executed based upon a scope of services generally outlined in our Work Authorization Agreement dated October 23, 2019, and other written and verbal communication.

We appreciate the opportunity to provide this environmental assessment for the subject site. If you have any questions or comments regarding this assessment, please do not hesitate to contact this firm at your convenience.

LOR Geotechnical Group, Inc.

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EXECUTIVE SUMMARY

This firm conducted a Phase I Environmental Site Assessment (ESA) for the proposed Calimesa Channel Basin Stage III, 4.6± acres of vacant land located near the southwest corner of the intersection at West County Line Road and 3rd Street in Calimesa, California. This Phase I ESA was conducted in conformance with American Society for Testing and Materials (ASTM) E1527-13 and All Appropriate Inquiries (AAI) set forth in 40 CFR (Code of Federal Regulations) part 312.

The subject site has been agricultural grove, vacant land, and/or residential use dating back to at least 1899. The subject site is currently vacant land.

No drums, buckets, or other containers, which might pose an adverse environmental impact to the subject site, were observed. No soil staining, chemical odor, or other signs of obvious soil contamination were noted, except for very minor oil-stained soil which is a de minimis condition.

There are several sites listed in environmental regulatory and proprietary databases within 1 mile of the subject site. However, based on our research and Vapor Encroachment Screen (VES), no environmentally impaired properties, listed within these databases, have current or former releases of hazardous substances and/or petroleum products that have migrated to the subject site. Based on the results of our VES, a vapor encroachment condition (VEC) at the subject site can be ruled out.

This Phase I ESA has revealed no evidence of recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), or controlled recognized environmental conditions (CRECs) indicative of releases or threatened releases of hazardous substances on, at, in, or to the subject site. However, two potential environmental concerns were noted during our review of historical aerial photographs:

- The presence of agricultural grove in the central and southern portions of the subject site (approximate lower two-thirds) in 1938, gone by 1949.

- In the 1950s, within the east portion of the subject site, particularly in the approximate east one-third of the subject site, was natural vegetative growth, numerous smaller objects and possibly small piles of materials or disturbed soils, and some dirt drives or roads.

- The nature of the activities associated with this portion of the subject site is undetermined. Currently, there is no onsite evidence of these historical activities.

The above potential environmental concerns are not anticipated to have had a significant environmental impact to the subject site. The only way to confirm this conclusion is to perform soil sampling and analysis. However, with regards to the onsite historical activities in the 1950s, it may be impractical and/or infeasible to develop an effective soil sampling plan to address potential impacts, due to the lack of undetermined nature of past activities.

INTRODUCTION

During October to December 2019, a Phase I ESA was conducted by this firm for the proposed Calimesa Channel Basin Stage III, 4.6± acres of vacant land, portions of Assessor's Parcel Numbers (APNs) 410-030-049 through -052, located near the southwest corner of the intersection at West County Line Road and 3rd Street in Calimesa, Riverside County, California. The subject site is currently vacant land, planned to be developed into an approximate 20-foot deep storm water basin that will include an inlet, outlet, and spillway.

The Phase I ESA was conducted in conformance with the Standard Practice for Environmental Site Assessments: Phase I ESA Process, ASTM E1527-13, and AAI set forth in 40 CFR Part 312. The purpose was to identify RECs, HRECs, and/or CRECs that may be associated with the subject site. A REC is defined as the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. A HREC is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the property, and has been addressed to the satisfaction of the applicable regulatory authority or meets the unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (i.e., property use restrictions, activity and use limitations, institutional controls, or engineering controls, which would fall under a controlled recognized environmental condition or CREC). This does not include de minimis conditions, that generally, do not present a threat to human health or the environment, and generally would not be the subject of an enforcement action if brought to the attention of the appropriate government agency. Conditions determined to be de minimis are not RECs or CRECs.

The approximate location of the site within its regional setting is presented on an Index Map (Figure 1). The proposed storm water basin is presented on a Storm Drain and Basin Plan (Figure 2).

The findings of our Phase I ESA, as well as our conclusions and recommendations, are presented in the following sections of this report.

NON-SCOPE CONSIDERATIONS

The following environmental issues are outside the scope of ASTM E1527-13 and 40 CFR Part 312:

- Lead in Drinking Water
- Lead-Based Paint
- Wetlands
- Methane
- Radon
- Cultural Land Historical Resources
- Industrial Hygiene
- Health and Safety
- Ecological Resources
- Endangered Species
- Indoor Air Quality
- Mold and Mildew
- Asbestos-Containing Materials
- Mineral Resources
- Regulatory Compliance
- Natural Hazards
- High Voltage Power Lines

METHODOLOGY AND PROCEDURES

Per ASTM E1527-13 and AAI, User provided information, as available, was evaluated with respect to site history, usage, and environmental concerns.

A general review of the physical setting of the subject site, including geology and groundwater hydrology, was performed. This review, in part, provides information regarding the potential for groundwater to be contaminated and the potential pathways for contaminant transport.

Historical maps, aerial photographs, and other records and information were researched and examined, as available, to investigate the present and past use of the subject site and surrounding area.

As available, person(s) knowledgeable about the subject site were interviewed to obtain any known information regarding site usage and potential environmental concerns.

Concurrent with our public and governmental agency interviews and literature research, a site reconnaissance of the property was conducted. The site reconnaissance was conducted in order to determine current uses of the site and the potential for soil and/or possible groundwater contamination based on aboveground visual observation.

During this Phase I ESA, public regulatory agencies, potentially including environmental, building, etc. were contacted directly or online research was conducted for information regarding permits, underground storage tanks (USTs), hazardous materials incidents, and general information about the subject site and surrounding area to ascertain the past uses with respect to environmental concerns.

Federal, state, local, tribal, and proprietary lists and databases were reviewed to ascertain the presence of known environmentally impaired sites on the subject site or within the immediate area, and to determine their impact, if any, to the site.

As part of the Phase I ESA, a Vapor Encroachment Screen was conducted to determine if a vapor encroachment condition exists, based on the information obtained during the Phase I ESA.

More details regarding the above methodology and procedures are described in other sections of this report.

USER PROVIDED INFORMATION

ASTM E1527-13 defines a User as the party seeking to use Practice E1527 to complete an environmental site assessment of the property. A User may include, without limitation, a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager.

Under ASTM E1527-13 and AAI, specific tasks are assigned to the User that will help identify the possibility of RECs in connection with the property. These tasks do not require the technical expertise of an environmental professional and are generally not performed by environmental professionals performing a Phase I ESA. The User may provide the information gathered from these tasks, including the following:

- Any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law;
- Any activity and land use limitations (AULs), such as engineering controls, land use restrictions, or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state, or local law;
- Specialized knowledge or experience (that is material to RECs in connection with the property) of the User related to the property or nearby properties (for example, is the User involved in the same line of business as the current or former occupants of the property or an adjoining property so that the User would have specialized knowledge of the chemicals and processes used by this type of business);
- Relationship of the purchase price to the fair market value of the property if it were not contaminated (reason for significantly lower purchase price, such as contamination is known or believed to be present at the property);
- Commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases (such as the past uses of the property, specific chemicals that are present or once were present at the property, spills or other chemical releases that have taken place at the property, and any environmental cleanups that have taken place at the property);
- Any obvious indicators that point to the presence or likely presence of contamination at the property, based on the knowledge and experience of the User related to the property; and
- Other information, including the reason why the Phase I ESA is required and/or is being performed, the type of property and type of property transaction (sale, purchase, exchange, etc.), the complete and correct address for the property, the scope of services desired for the Phase I ESA, identification of all parties who will rely on the Phase I ESA report, identification of the site contact and how the contact can be reached, any special terms and conditions which must be agreed upon by the environmental professional, and any other knowledge or experience with the property that may be pertinent to the environmental professional (for example, copies of any available prior environmental site assessment reports, documents, correspondence, etc., concerning the property and its environmental condition).

A User Questionnaire was completed by a representative of the current owner of the subject site. The completed questionnaire indicates there are no environmental liens or AULs recorded or filed for the subject site, there are no indicators of any contaminants, and the purpose for conducting this assessment is the prospective purchase of the subject site (vacant land) by the City of Calimesa. The Billy W. Simmons Family Trust, the current owner of the subject site, and City of Calimesa, are identified as the parties who will rely on this report. A copy of the completed User Questionnaire is provided in Appendix A.

Another User, the client, provided us with a map showing thirty (30) infiltration or percolation test locations across the subject site. The infiltration test locations are indicated to be 20 feet deep and the percolation test locations are indicated to be 40 feet deep. Details regarding these test locations, as observed in the field, are discussed in the **SITE RECONNAISSANCE** section of this Phase I ESA report.

Environmental Cleanup Liens and Activity and Use Limitations

Under AAI and ASTM E1527-13, a search for environmental cleanup liens and AULs must be conducted, typically by the User. The subject site, whose researched historical use has been agricultural (including grove and dry farm land), vacant land, and/or single-family residential, did not appear in the state and/or federal liens, deed, or activity/use limitation databases in The Environmental Data Resources, Inc. (EDR) Radius Map™ Report with Geocheck® (Appendix H), and no records on file with the County of Riverside Department of Environmental Health (CRDEH) were found for the subject site, which indicate there are no environmental cleanup liens or AULs associated with the subject site.

PHYSICAL SETTING

Topography

The subject site is situated at elevations ranging from approximately 2,472 to 2,485 feet above mean sea level (amsl). The topography is relatively planar with an overall fall in a westerly direction. The area in/near the northwest corner of the subject site appears to be situated a couple of feet higher than the surrounding ground surface.

Regional Geologic Setting

The subject site is located along the junction of two major geomorphic provinces of southern California, or at the end of the Peninsular Ranges geomorphic province where it meets the Transverse Ranges geomorphic province. The Peninsular Ranges include a series of small, northwest-trending mountains, separated by wide flat valleys, that extend from the Los Angeles region southeastward into Baja, California. The northern margin of this province butts up against a series of mountain ranges that lie in a transverse direction to the normal northwestern trend, or extend east and west. These mountains include the Santa Monica Mountains, the San Gabriel Mountains, and the San Bernardino Mountains that lie just north and east of the City of Calimesa. In the Calimesa locality, these two major provinces are termed the Peninsular Ranges Block to the south and the San Bernardino Mountains Block to the north, and are separated by a series of complex faults known collectively as the San Andreas Fault Zone. In this tectonically complex area, the Peninsular Ranges Block is generally sliding to the northwest, and partially thrusted underneath the San Bernardino Mountains Block. Therefore, the resulting faults end up with a complex mix of strike slip and thrust faults.

The San Andreas fault, which lies approximately 5.3 miles to the northeast, acts as the boundary between the Peninsular and Transverse Ranges provinces. The next largest active fault in the region, in terms of total movement and anticipated magnitudes, is the San Jacinto fault which lies approximately 5.8 miles to the southwest. This fault has similar motions to the San Andreas or right lateral strike slip.

While the trend of the San Andreas fault is predominately a relatively straight line across much of California, in the area just north of Indio, the San Andreas fault has an approximately 15-mile wide step-over zone, stepping to the west and cutting across the San Gorgonio Pass, then up to the eastern end of the City of Yucaipa. Beyond this to the northwest, the trend of the fault once again resumes a northwesterly course. This twisting motion has results in a complex tectonic setting in the region between the San Andreas and the San Jacinto faults, which is not as yet completely understood. However, in general, the result of this geometry is that along the San Gorgonio Pass and up into the Yucaipa region, the motion changes from right lateral strike slip to thrusting. Within the Calimesa-Yucaipa region, this complex motion has resulted in several types of motions, extension with tectonic activity, including essentially all types of fault motions, from right lateral strike slip, or horizontal, to thrusting and normal, or tensional faulting along a numerous series of smaller fault splays. One of the largest of these smaller splays is the Banning fault, lying along the base of the San Bernardino Mountains and situated approximately 1,600 feet to the southwest of the site. This fault appears to be the dominate thrust in the western end of the pass, joining the San Gorgonio Pass Fault Zone to the east with the motion changing to strike slip.

Therefore, the topography of the land in this region has been drastically altered by differing tectonic forces, which have resulted in the uplifting of the region east of the subject site. The bedrock materials underlying the region of the small hills to the east of Calimesa are composed of a complex mix of metamorphic rocks of gneiss, schist, phyllite, and meta-igneous rocks of meta-diorite to meta-granotoid rocks. These rocks are very similar in composition to the basement rocks of the far southeastern end of the San Bernardino Mountains Block.

The subject site has been mapped by the United States Geological Survey as being underlain by old (late to middle Pleistocene) axial-valley deposits, described as moderately to well consolidated silt, sand, and gravel (Matti et al., 2003).

Hydrogeology

The subject site is located near the south side of the central portion of the Yucaipa Subbasin which is situated within the Upper Santa Ana Valley Groundwater Basin. The Yucaipa Subbasin underlies the southeast part of San Bernardino Valley. It is bounded on the north by the San Andreas fault, on the west by the Redlands fault and the Crafton Hills, on the south by the Banning fault, and on the east by the Yucaipa Hills. This part of the San Bernardino Valley is drained by Oak Glen, Wilson, and Yucaipa Creeks south and west into San Timoteo Wash, a tributary to the Santa Ana River.

Groundwater within the Yucaipa Subbasin is found chiefly in alluvium, with lesser quantities in the San Timoteo Formation and fractured bedrock beneath the alluvium. Alluvial deposits in the subbasin are divided into older and younger units. The Holocene age younger alluvium consists of unconsolidated boulders, gravel, sand, silt, and clay. This unit forms a thin veneer and is mostly above the water table. The middle to late Pleistocene age older alluvium consists of boulders, gravel, sand, silt, and clay, and holds the primary source of groundwater in the subbasin. Clays present in this section are due to weathering and soil formation during accumulation of the deposits.

Several structures disrupt groundwater flow in the subbasin. The Chicken Hill fault, Yucaipa barrier, Casa Blanca barrier, and Gateway barrier all restrict groundwater movement, trend northeasterly, and were formed in response to differential movements along the San Andreas and Banning faults. These structures displace water levels as much as 160 feet across them. The Oak Glen fault and the South Mesa barrier trend northwesterly, and are the result of sympathetic movement related to the San Andreas and Banning faults. These structures displace water levels as much as 120 feet across them.

The Redlands and Crafton faults have displacements of groundwater levels, which indicate that they are partial barriers to groundwater flow. In the western part of the subbasin, northeast-dipping beds of the San Timoteo Formation form barriers that cause groundwater to rise to the surface.

Water level records in most parts of the subbasin show relatively small seasonal fluctuations and a steady decline from 1918 through 1933, without significant recovery during the following wet years. Increased pumping and reduced recharge caused by below-normal precipitation resulted in an increased rate of water level decline of 10 to 20 feet per year beginning in 1945. This rate of decline continued into the early 1960s then was reduced to 5 to 10 feet per year in 1969.

The water table in the Yucaipa Subbasin slopes steeply from the San Andreas fault through a narrow gap to Yucaipa, then flattens southwest of Yucaipa. At Live Oak Creek and other ravines in the north, the water table reaches the surface. Fluctuations in water levels were usually around 5 to 10 feet annually. In 2004, the subbasin was in an overdraft state; however, water levels were at or near historic highs. Groundwater within the subbasin is typically reached between 200 to 280 feet below the surface.

Groundwater flow is generally from areas of recharge in the north and east along the edges the San Bernardino Mountains and the Crafton and Yucaipa Hills, towards the Bunker Hill Subbasin on the southwest and west (California Department of Water Resources, 2004).

Local water level measurements were researched at the California Department of Water Resources (DWR) online Water Data Library (California DWR, 2019). The closest well found in this search, State Well No. 02S02W12M001S, is located approximately 0.5 mile north-northwest of the subject site. This well has groundwater level measurements from December 1926 to June 1998 ranging from approximately 206 to 336 feet below the ground surface (bgs). The reference elevation for this well at 2,477.26 feet amsl is within the range of ground surface elevations of the subject site, suggesting the groundwater beneath the subject site may be at similar levels. A second well, State Well No. 02S02W14J002S, is located approximately 0.7 mile southwest of the subject site. This well has groundwater level measurements from June 1998 to October 2010 ranging from approximately 155 to 159 feet bgs. The reference elevation for this well at 2,420.80 feet amsl is approximately 50 feet lower than the range of ground surface elevations for the subject site, which if added to the reported groundwater levels, would suggest a range of groundwater levels around 200 feet bgs at the subject site.

Based on the researched groundwater levels, groundwater beneath the subject site is estimated to be around 200 feet bgs or deeper.

The local groundwater flow direction is estimated in a westerly direction, coincident with the fall in local ground surface topography and flow of the adjacent Calimesa Channel and local Yucaipa Creek.

HISTORY OF SITE USAGE

To obtain a history of previous site usage, a search was conducted for available historical Sanborn Fire Insurance and topographic maps, aerial photographs, County Assessor's parcel information, county building records, and city directory information.

Sanborn Fire Insurance Maps

No coverage of Sanborn Fire Insurance maps was available for the subject site. The Certified Sanborn® Map Report from EDR is provided in Appendix B.

Historical Topographic Maps

Historical topographic maps of the quadrangle that includes the subject site and/or adjoining quadrangle, at a scale of approximately 1"=2,200', provided by EDR from 1899, 1901, 1942, 1943, 1953/1954, 1954, 1967, 1973, 1979/1980, 1988, 1996, and 2012, were reviewed. The historical EDR topographic maps are provided in Appendix C.

The early map images, 1899 and 1901, are essentially the same, from large scale maps (likely 1:62,500 or larger). Coverage of these maps ends approximately 550 feet south of the subject site. These map images show the subject site as vacant land, immediately surrounded by vacant land. The Riverside-San Bernardino County Line is shown over 100 feet north of the subject site. Yucaipa Creek is shown approximately 0.7 mile to the north.

The 1942 and 1943 maps, likely from maps at a scale of 1:24,000 or 1:62,500, show map coverage offsite to the south, over 800 feet from the subject site. These maps are essentially the same. The areas shown include agricultural groves, residential-sized structures, a couple of apparent small ponds, retention basins, or reservoirs, drainage features, paved and dirt roads, and vacant land.

The map images from 1953/1954 and 1954, likely from maps at a scale of 1:24,000 or 1:62,500, show the subject site as vacant land. The present day roads near the subject site, West County Line Road and 3rd Street have been built, along which are numerous residence-sized buildings, some of which are on properties adjacent to the northwest, north, northeast, east, and southeast of the subject site. The Calimesa Channel is shown along the south side of the subject site. Agricultural groves are shown in the area with none at the subject site. The 1953/1954 map shows agricultural grove to the west of the north portion of the subject site.

The map images from 1967, 1973, and 1979/1980 are largely the same, likely from maps at a scale of 1:24,000, and show the subject site and surrounding properties largely the same as on the 1953/1954 and 1954 map images. Additional residence-sized buildings are shown to the south beyond the Calimesa Channel. No agricultural groves are shown at or adjoining the subject site.

The map images from 1988 and 1996 are essentially the same, likely from maps at a scale of 1:24,000. The coverage shown on the 1988 map image ends approximately 880 feet south of the subject site. The subject site and surrounding properties are largely the same, with the exception being the property adjacent to the west where several residence-sized buildings have been added and three rectangular buildings are shown, likely with associated commercial use.

The map image from 2012 is likely from a map at a scale of 1:24,000. This map image does not show structural features, but includes infrastructure, topography, and surface water features. Based on the additional roads shown near the subject site, additional development has taken place.

Aerial Photograph Review

Digital aerial photographs provided by EDR, from 1938, 1949, 1953, 1959, 1961, 1967, 1975, 1985, 1989, 1990, 1995, 2005, 2009, 2012, and 2016, were reviewed to investigate the past use of the subject site and the surrounding properties. Google Earth Pro computer program (2019) recent (1995 to 2018) and online (Nationwide Environmental Title Research, LLC, 2019) historical digital aerial images were used to enhance our review and/or provide supplementary review. A limited number of stereographic pairs of aerial photographs on file at the County of San Bernardino Flood Control District (CSBFCD), from 1953, 1955, 1959, and 1965, were reviewed to evaluate the east portion of the subject site which appeared in the EDR digital aerial photographs from 1953 and 1959 (and possibly

1961) to include areas of apparent disturbed soils or piled soils or other materials.

Copies of the historical aerial photographs provided by EDR with the approximate boundaries of the subject site are provided in Appendix D.

A brief summary of the site and surround conditions during the various times, as reflected in the EDR aerial photographs, is given below.

1. <u>Date: June 14, 1938, Source: EDR (USDA), Approximate Scale: 1"=500'</u>

In this early aerial photo image, the northern approximate one-third of the subject site is largely vacant land, with a smaller square structure, roughly 15 feet wide and long, located along the east subject site boundary, just south of the northeast subject site corner. The central and southern portions of the subject site (approximate lower two-thirds) is largely comprised of what appear to be younger agricultural grove trees, which extend offsite to the east. Adjacent to the east and northeast, near the northeast corner of the subject site, are a residence (situated near the southwest corner of the intersection at West County Line Road and 3rd Street) and associated apparent outbuildings, including the one along the east subject site boundary. The Calimesa Channel is a natural drainage feature bordering to the south of the subject site. To the south beyond this drainage feature is vacant land and a relatively mature agricultural grove among which are a residence and associated structures. Adjacent to the west are three types and/or ages of agricultural grove trees, with the youngest in the south end, which appear recently planted. Adjacent to the north of the subject site is vacant land. West County Line Road is a small, unimproved, 2-lane, asphalt-paved road approximately 150 feet north of the subject site, as is 3rd Street approximately 160 feet to the east.

2. <u>Date: May 23, 1949, Source: EDR (USDA), Approximate Scale: 1"=500'</u>

The agricultural grove has been removed from the subject site. Most of the subject site includes what appears to be natural vegetation that is being maintained by mowing or discing, or is possibly fallow dry farm land. In and near the southwest subject site corner is vacant, unkept land, and along the south side of the subject site in the central and east portions, vegetation has been cleared for the most part with a dirt road leading into the east side near the southeast site corner. Three single-family residences have been added near/along West County Line Road, north of the subject site. Just northwest of the subject site, along the south side of West County Line Road, the present day single-family residence and associated detached garage have been added. Just northeast of the southeast corner of the subject site, a single-family residence has been added. South of Calimesa Channel, the agricultural grove is gone, with additional structures present, possibly including residences, and two smaller agricultural groves in rectangular areas. West County Line Road has been widened, but still appears to be an unimproved, 2-lane road.

3. Date: February 16, 1953, Source: EDR (USDA), Approximate Scale: 1"=500'

The subject site is largely dryland farmed, with an apparent rectangular structure in the southeast corner along the south side of a dirt road, both of which appear to be associated with an offsite residence and detached garage on the adjacent property to the east. Near this rectangular structure and extending through most of the approximate east one-third of the subject site is natural vegetative growth, numerous smaller objects and possibly small piles of materials or disturbed soils, and some dirt drives or roads. The 1955 CSBFCD aerial photographs show this area extended westward, filling in most of the east portion of the subject site. This area with natural vegetation extends offsite to the east, ending on the west side of 3rd Street. A couple of single-family residences appear to have been built east of the subject site. Approximately 80 feet west of the subject site, a single-family residence and two longer, rectangular buildings are now present. To the east, 3rd Street has been widened, but still appears to be an unimproved, 2-lane road.

4. Date: October 16, 1959, Source: EDR (USDA), Approximate Scale: 1"=500'

The area of the subject site previously shown with smaller objects, natural vegetation, dirt drives/roads, and small piles of materials or disturbed soils is now limited to an area approximately 150 feet wide by 150 feet long. The rectangular structure in the southeast corner of the subject site appears absent with a concrete slab foundation apparently remaining. The rest of the subject site appears to be either dry farm land or mowed, natural, dry vegetation. A single-family residence has been added to the east of the subject site. Around half a dozen single-family residences have been added to the south beyond the Calimesa Channel. Among the mature grove offsite to the west, additional longer, rectangular structures have been added, along with a few residences and associated structures. The younger grove in/towards the south end of the subject site is gone.

5. Date: July 8, 1961, Source: EDR (USDA), Approximate Scale: 1"=500'

The subject site and surrounding properties appear largely the same as previously shown. The area approximately 150 feet wide and long previously shown in the northeast corner of the subject site appears to be cleared of the objects and piles, but it is difficult to discern due to the exposure of the digital aerial photograph. The review of the CSBFCD 1965 aerial photographs suggest this area has been leveled with no piles or disturbed soils remaining, with natural vegetation growing and remnant lighter colored objects that may be larger rocks or pieces of concrete.

6. **Date: May 9, 1967, Source: EDR (USDA), Approximate Scale: 1"=500'**

The subject site appears essentially the same as shown in the CSBFCD 1965 aerial photograph, and is vacant land with essentially natural vegetation. The concrete slab foundation in the southeast corner of the subject site appears absent. The EDR 1967 digital aerial photograph continues to show what appear to be remnant smaller objects near the northeast corner of the subject site. The surrounding properties appear largely the same as previously shown, except adjacent to the west of the south portion of the subject site appear to be at least five adjacent long, rectangular structures, suggesting a commercial usage such as landscape nursery or poultry ranch. Also, at least two single-family residences have been added south of the Calimesa Channel.

7. **Date: August 1, 1975, Source: EDR (USDA), Approximate Scale: 1"=500'**

This digital infrared photo image is of somewhat poor quality. However, the subject site and surrounding properties appear largely the same as previously shown. The square structure near the northeast corner along the east subject site boundary is absent. The present day 7 Eleven building is evident at least approximately 80 feet east of the northeast subject site corner, replacing the residence previously situated at its location. At the north end of the offsite 7 Eleven property, over 150 feet away, there may be a canopy structure associated with a fueling (gasoline) station. The Calimesa Channel has been artificially channelized and concrete lined bordering to the south, extending east-northeast and westerly beyond the subject site.

8. **Date: September 2, 1985, Source: EDR (USDA), Approximate Scale: 1"=500'**

This digital infrared photo image is of somewhat poor quality. However, the subject site and surrounding properties appear essentially the same as previously shown, with a couple of residential outbuildings or structures added adjacent to the east near the southeast corner of the subject site. The remnant light colored objects near the northeast corner of the subject site, possibly including large rocks and pieces of concrete, are no longer evident.

9. Date: August 14, 1989, Source: EDR (USDA), Approximate Scale: 1"=500'

The subject site and surrounding properties appear essentially the same as previously shown. A single-family residence was added to the south beyond the Calimesa Channel. Over 180 feet to the north, on the north side of West County Line Road, the present day retail center ("Town Center") and self car wash ("Auto Spa") have been constructed.

10. Date: August 29, 1990, Source: EDR (USDA), Approximate Scale: 1"=500'

The subject site and surrounding properties appear largely the same as previously shown. The two single-family residences north of the east portion of the subject site have been removed. Two single-family residences have been added on the property adjacent to the east of the central portion of the subject site.

11. Date: October 2, 1995, Source: EDR (USGS/DOQQ), Approximate Scale: 1"=500'

The subject site and surrounding properties appear largely the same as previously shown. Onsite, along the north boundary, just east of the northwest corner, is a lighter colored object, possibly a vehicle of some kind. A dirt road appears to have been worn from the location of this possible vehicle up to West County Line Road. The long, rectangular structures adjacent to the west of the south portion of the subject site appear to have significant tree or other vegetation growth present, suggesting partial removal of these structures. Offsite to the southwest across the Calimesa Channel, a new tract of single-family residences have been built.

12. Date: 2005, Source: EDR (USDA/NAIP), Approximate Scale: 1"=500'

The subject site and surrounding properties appear essentially the same as previously shown. The vehicle previously shown onsite and apparent associated dirt road up to County Line Road are absent. The offsite rectangular structures adjacent to the west of the south portion of the subject site are likely mostly destructed.

13. Date: 2009, Source: EDR (USDA/NAIP), Approximate Scale: 1"=500'

The subject site and surrounding properties appear essentially the same as previously shown.

14. Date: 2012, Source: EDR (USDA/NAIP), Approximate Scale: 1"=500'

The subject site and surrounding properties appear largely the same as previously shown. The single-family residence north of and near the northwest corner of the subject site appears to be gone.

15. Date: 2016, Source: EDR (USDA/NAIP), Approximate Scale: 1"=500'

The subject site and surrounding properties appear essentially the same as previously shown. The light coloring which indicated the long, rectangular structures offsite to the west of the south portion of the subject site appears completely absent.

The Google Earth Pro aerial images from 2016 to 2018 show the subject site and the surrounding area essentially the same as in the EDR 2016 digital aerial photograph.

County Assessor's Parcel and Ownership Information

The subject site is comprised of approximately 4.6 acres which includes portions of APNs 410-030-049 through -052. These parcels comprise a total of 5.98 acres. These parcels have no associated addresses and are indicated to be vacant land (Parcel Quest Lite, 2019). The current owner of the subject site is the Billy W. Simmons Family Trust.

A copy of the Assessor's Parcel Map is presented on Figure 3 with the approximate boundaries of the subject site.

County Building Records

A records request was submitted online to the County of Riverside Building and Safety Department for any historical building records that may be associated with APNs 410-030-049 through -052, portions of which comprise the subject site. A response was received by telephone on November 5, 2019. An address at 345 County Line Road was stated to be associated with all four of these APNs. The only building records available included a permit and re-inspections related to a solar hot water system.

City Directory Information

Historical EDR city directory information (image report) was requested for the nearby streets to the subject site, West County Line Road and 3rd Street.

The available listings are from 1971 to 2014. The EDR-City Directory Image Report is provided in Appendix E.

Listings for 3rd Street are mostly residential, but include some commercial listings, including telecommunications, tire service, floor covering, contracting, notary, pool plastering, golf course, and welding services.

Listings for West County Line Road include a mix of residential and commercial listings. The commercial listings include printing, real estate/realtors, insurance, shoe repair, medical offices, food establishments, auto repair garage, convenience store (7 Eleven), construction, water district, auto machine shop, auto smog testing, law office, electric contractor, and plant nursery.

SITE RECONNAISSANCE

Site reconnaissance was conducted on October 24, 2019. To orient our site reconnaissance, a copy of a recent color aerial photograph (Google Earth aerial image) was obtained for our use. This recent color aerial photograph with approximate site boundaries is presented on Figure 4.

The subject site is approximately 4.6 acres of trapezoid-shaped, vacant land. Along the east and west boundaries are wood and metal fencing of various heights up to approximately 6 feet, associated with the offsite, adjacent properties. Along the south subject site boundary is an approximate 6-foot high metal chain-link fence, associated with the offsite, adjacent Calimesa Channel. Vegetation across the subject site is mostly dry to green weeds, light to dense. A couple of small volunteer trees are present, along with bamboo in the southwest corner of the site. A landscaped tree is present immediately west of the fencing along the east subject site boundary, likely associated with an offsite single-family residential property. Cactus was observed along the east boundary growing into the subject site.

Thirty soil test (infiltration and percolation) locations were seen onsite. These locations included open, approximate 8-inch boreholes with approximate 3-inch perforated pipes in them, wooden stakes indicating the boreholes were 20 or 40 feet bgs, and small piles of soil which were presumably excavated during drilling of the boreholes. Some of the perforated pipes had a type of filter fabric covering them. The map provided by the client, a User, as previously discussed under the **USER PROVIDED INFORMATION**, shows all thirty soil test locations.

No evidence of utilities were observed onsite, except for a sewer manhole cover indicated to belong to Yucaipa Valley Water District (YVWD). This sewer manhole cover is situated within a concrete pad approximately 5 feet wide and long. A crash post is located near the southeast corner of this concrete pad which is situated in/near the southwest corner of the subject site. The alignment for the underground sewer line associated with the YVWD sewer manhole cover is not apparent.

Relatively small amounts of illegally dumped trash and debris are present, including plastic, concrete, glass, wood, tires (a few), clothes, ceramic tiles, cardboard, and metal.

In/near the northwest corner of the subject site is debris, including rock, concrete, and wood, that appears to be related to the demolition of the offsite, nearby former single-family residence to the north. This area of the site appears to be situated a couple of feet higher than the surrounding ground surface, and may include disturbed soils associated with the demolition of the former nearby residence.

No containers with hazardous materials or wastes and no signs of obviously contaminated soils were observed, except for a very small amount of apparent oil-stained soil at the southwesternmost soil test percolation location (I-11).

Adjoining Properties

The subject site is bordered to the north by vacant land similar to the subject site. Past this vacant land is West County Line Road, a partially improved, asphalt-paved, 3-lane (two travel lanes and one turn lane) road, beyond which are commercial properties that include a self car wash, a dentist, an optometrist, property management, restaurants, realtors, a liquor store, insurance companies, and a medical group. Adjacent to the east and west of the subject site are single-family residential properties. The adjacent residential property to the west includes old structures that suggest a commercial use such as landscape nursery or agricultural-related use; however, these uses appear to have ended years ago. An apparent sealed/closed, blue, steel 55-gallon drum is located approximately 10 feet west of the subject site. This drum is slightly rusted, but appears intact with no signs of leakage. Beyond the northeast corner of the subject site to the east is vacant land, beyond which is a 7 Eleven convenience store, approximately 90 feet from the subject site. Border to the south of the subject site is the Calimesa Channel, a concrete-lined, trapezoidal ditch, flood control channel. Beyond this channel are single-family residential properties.

Color photographs of the subject site and adjoining properties are provided in Appendix F.

REGULATORY AGENCY RECORDS REVIEW

For records relating to environmental compliance and hazardous materials/waste within the County of Riverside, the CRDEH generally is the lead agency. The California Regional Water Quality Control Board, Santa Ana Region (CRWQCB-SAR) or CRDEH may be the lead agency for soil and/or groundwater investigations and remediation. These agencies were contacted, directly or online, for records they may have for the subject site and/or nearby properties.

County of Riverside Department of Environmental Health

Requests to review records for the subject site, and possibly adjoining properties, utilizing address ranges along West County Line Road and 3rd Street, were emailed to the CRDEH on October 23, 2019. In letters dated November 5, 2018, the CRDEH indicated that records were found. These electronic records were provided by email on November 13, 2019. The records provided are for 7 Eleven at 301 West County Line Road, located approximately 90 feet east of the subject site, and McDaniel's Garage at 367 West County Line Road, located approximately 140 feet west of the subject site. Copies of the CRDEH records response letters are provided in Appendix G.

The records for 7 Eleven at 301 West County Line Road include hazardous materials disclosure related to carbon dioxide and propane. Notices to Comply or Notices of Violation were documented, including Hazardous Materials Business Plan not available onsite, failure to establish and implement a Hazardous Materials Business Plan, no employee hazardous materials handler training documented, failure to obtain hazardous materials permit, and failure to have safety data sheets available.

A CRDEH letter, dated November 3, 1998, indicates the CRDEH had no records regarding the former USTs located at the 7 Eleven site. It was believed, though not confirmed, that the USTs were removed prior to the start of the CRDEH Hazardous Materials Management Division in late 1985. It was also believed that subsurface contamination as a result of a release of motor vehicle fuel was nonexistent or not significant in extent. It was acknowledged there was a possibility that records had been lost.

The records for McDaniel's Garage range from May 1989 to February 1995, and primarily involve hazardous waste generation of waste oil related to automotive maintenance, including permits and inspections. Around 6 gallons or less of waste oil were generated per month. Noted violations include lack of hazardous waste container labeling and keeping hazardous waste manifests or receipts for at least 3 years. In 1993, complaints were made about waste oil disposal to the ground, to which the CRDEH responded. The operation was noted to be a non-generator of hazardous waste in February 1995.

California Regional Water Quality Control Board - Santa Ana Region

The California State Water Resources Control Board (SWRCB) maintains the online GeoTracker database, which includes CRWQCB-SAR records for: 1) cleanup sites, including leaking underground storage tank (LUST) sites, cleanup program sites, military cleanup sites, and California Department of Toxic Substances Control (DTSC) cleanup sites; 2) permitted facilities, including waste discharge requirements sites, permitted USTs, DTSC hazardous waste sites, land disposal sites, irrigated lands regulatory program sites, and oil/gas sites; and 3) other sites, including project sites, non-case information sites, sampling points - public, and field points. This database was searched for records that may pertain to the subject site, and none were found. The closest identified site to the subject site is Frontier California, Inc. at 1010 Calimesa Boulevard, located approximately 0.65 mile west-southwest of the subject site. This site is a permitted UST site with no reported release (California State Water Resources Control Board, 2019). Based on the distance away, this UST site and other listed sites should have no adverse environmental impact to the subject site.

ENVIRONMENTAL DATABASE REVIEW

EDR was contacted to provide an environmental database search for the subject site. The database search provides information regarding landfills, USTs, hazardous waste generators, etc., at the subject site and surrounding properties in accordance with ASTM Standards and AAI. Four sites, not including the subject site, were found in EDR's search of available government records within the respective search radii. A copy of the EDR database report, which provides a complete list of the federal, state, tribal, and proprietary records searched, is provided in Appendix H.

HIST UST

The California SWRCB maintains the Historical UST (HIST UST) list which contains active and inactive underground storage tank locations. This database lists one site, 7-Eleven Store 13980 (2131), located at 301 (West) County Line Road, approximately 85 feet east of the subject site. This facility is listed with two USTs, two 10,000-gallon gasoline (unleaded and regular) tanks. Based on the distance away and lack of reported release, the listed HIST UST site is not anticipated to have an adverse environmental impact to the subject site.

RCRA-NonGen

RCRAInfo is USEPA's comprehensive information system that includes selective information on sites which generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA. Non-Generators do not presently generate hazardous waste. One site, Calimesa Dental at 34636 County Line Road, Suite 19, over 200 feet north of the subject site, is listed in this database. The listed RCRA-NonGen has no reported violations. Based on the distance away and lack of reported violations, the listed RCRA-NonGen site should not have an adverse environmental impact to the subject site.

San Bernardino County Permit

This database, maintained by the San Bernardino County Fire Department, Hazardous Materials Division, includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers. One site, Casa Trejo at 34636 County Line Road, over 200 feet north of the subject site, is listed in this database. This site is listed for bulk carbon dioxide at a retail food facility, with a permit that last expired on May 31, 2010. The listed county permit site should have no adverse environmental impact to the subject site based on the nature of the permitting.

CA Notify 65

This database, no longer updated, includes listings of all Proposition 65 incidents reported to counties by the SWRCB and the RWQCB. One site, ARCO #83180 at 1216 Calimesa Boulevard, located over 0.7 mile southwest of the subject site, is listed in the CA Notify 65 database. No pertinent information is listed. Based on the distance from the subject site and regulatory oversight, this Notify 65 site should have no adverse environmental impact to the subject site.

Orphan Summary

The Orphan Summary within the EDR database report, which is a list of all sites whose location is not readily identified (mapped), and may be near the subject site, was reviewed. There are no sites listed in the Orphan Summary on or adjoining the subject site.

Division of Oil, Gas, and Geothermal Resources

The California Division of Oil, Gas, and Geothermal Resources (DOGGR) maintains a list of all producing and abandoned oil and gas wells within the State of California. The online DOGGR Well Finder was reviewed, which indicates no abandoned or producing gas and/or oil wells have been located within one mile of the subject site (DOGGR, 2019).

VAPOR ENCROACHMENT EVALUATION

As part of this Phase I ESA, a VES was conducted to determine if a VEC exists, based on the information obtained during the Phase I ESA. A VEC is the presence or likely presence of chemicals of concern (COC) vapors in the subsurface of the target property caused by the release of vapors from contaminated soil or groundwater either on or near the target property (i.e., subject site).

Vapor Encroachment Screen

A VES, comprised of Tier 1 and 2 (non-invasive) screening, was conducted by this firm for the subject site. The VES was conducted in general accordance with the Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions, ASTM E2600-15. Although not required to satisfy the requirements of the Phase I ESA under ASTM E1527-13, ASTM E2600-15 was chosen as a methodology to evaluate potential contaminant vapor concerns at or adjoining the subject site.

The subject site use has historically been agricultural grove, vacant land, and residential use. The subject site is located in a mixed residential and light commercial area. Based on past geotechnical investigation by this firm in the local area, the subject site and surrounding area are anticipated to be largely underlain by interbedded silty sands and sandy clays with occasional layers or lenses of clayey sands, sandy silts, and well-graded sands. Based on the local geology and hydrogeology, groundwater beneath the subject site, anticipated to be greater than 200 feet bgs, is not considered a potential source of contaminant vapor into the subject site.

Based on the results of Tier 1 screening, utilizing The EDR Radius Map™ Report with GeoCheck® and research of the history of the subject site and adjoining properties, the historical 10,000-gallon gasoline USTs at the 7-Eleven approximately 85 feet east of the subject site are the only site within 0.33 mile with current and/or former potential sources of soil vapor intrusion or encroachment. Based on the results of the VES, Tier 1 screening, a VEC at the subject site cannot be ruled out. However, based on Tier 2 screening, the location of the historical USTs, which have no reported release(s), are over 100 feet from the subject site, and therefore, a VEC can be ruled out.

DATA GAPS

Under AAI and ASTM E1527-13, data gaps that remain after the conduct of all required activities must be identified. The source of information consulted to address the data gaps should be identified, and the significance of the data gaps with respect to our ability to identify conditions indicative of releases or threatened release of hazardous substances on, at, in, or to the property should be addressed.

No interview was conducted with the current owner of the subject site. However, based on the historical usage of the subject site which has been predominantly vacant land, there are no significant data gaps remaining after our conduct of AAI and ASTM E1527-13.

CONCLUSIONS AND RECOMMENDATIONS

No drums, buckets, or other containers, which might pose an adverse environmental impact to the subject site, were observed. No soil staining, chemical odor, or other signs of obvious soil contamination were noted, except for very minor oil-stained soil which is a de minimis condition.

There are several sites listed in environmental regulatory and proprietary databases within 1 mile of the subject site. However, based on our research and Vapor Encroachment Screen (VES), no environmentally impaired properties, listed within these databases, have current or former releases of hazardous substances and/or petroleum products that have migrated to the subject site. Based on the results of our VES, a vapor encroachment condition (VEC) at the subject site can be ruled out.

We have performed this Phase I ESA in conformance with ASTM E1527-13 and AAI set forth in 40 CFR Part 312 for 4.6± acres of vacant land located near the southwest corner of the intersection at West County Line Road and 3rd Street in Calimesa, California.

This Phase I ESA has revealed no evidence of RECs, HRECs, or CRECs indicative of releases or threatened releases of hazardous substances on, at, in, or to the subject site. However, two potential environmental concerns were noted during our review of historical aerial photographs:

- The presence of agricultural grove in the central and southern portions of the subject site (approximate lower two-thirds) in 1938, gone by 1949.

- In the 1950s, within the east portion of the subject site, particularly in the approximate east one-third of the subject site, was natural vegetative growth, numerous smaller objects and possibly small piles of materials or disturbed soils, and some dirt drives or roads. The nature of the activities associated with this portion of the subject site is undetermined. Currently, there is no onsite evidence of these historical activities.

The above potential environmental concerns are not anticipated to have had a significant environmental impact to the subject site. The only way to confirm this conclusion is to perform soil sampling and analysis. However, with regards to the onsite historical activities in the 1950s, it may be impractical and/or infeasible to develop an effective soil sampling plan to address potential impacts, due to the lack of undetermined nature of past activities.

STATEMENT OF QUALIFICATIONS

We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquires in conformance with the standards and practices set forth in 40 CFR Part 312.

Mr. John Leuer is the President of LOR Geotechnical Group, Inc., founded in 1988. As a cofounder and President of the company, Mr. Leuer has managed LOR through hundreds of Phase I Environmental Site Assessments, as well as numerous Phase II Environmental Site Assessments and remediation projects, primarily remedial excavation. Mr. Leuer has over 36 years experience in the geotechnical and environmental fields. Mr. Leuer has substantial experience coordinating projects for many city, county and state agencies, as well as in the public sector, gaining a reputation for being responsive to clients needs while providing strong technical expertise. LOR Geotechnical Group, Inc. is one of three firms that previously provided report review for underground storage tank closure for the County of San Bernardino, Fire Department Hazardous Materials Division.

Mr. Leuer holds a B.S. in Civil Engineering from Cal State University at Northridge. He is a registered Geotechnical and Civil Engineer in the State of California. Mr. Leuer is a member of the American Society of Civil Engineers.

Mr. Mathew L. Hunt has over 20 years experience in the environmental field. Mr. Hunt works under LOR Geotechnical Group's environmental operations and has conducted over 350 Phase I Environmental Site Assessments for the private and public sectors. The properties have ranged from agricultural to residential to commercial/industrial. In addition to his experience with environmental assessments for property transfers, he has worked on projects that require mitigation prior to development. Mr. Hunt is well versed in hazardous waste sampling and characterization methodologies in soil and groundwater regimes for groundwater monitoring, site assessment, and site remediation. Projects have ranged from leaking USTs at gasoline stations to commercial and government (including Superfund/CERCLA sites) projects involving metals, perchlorate, and solvents.

Mr. Hunt has a B.S. in soil science from California Polytechnic State University, San Luis Obispo and a M.S. in soil and water science from the University of California, Riverside.

LIMITATIONS

This report was prepared solely for the use and benefit of LOR's client, TKE Engieering, Inc., and their designates, including the Billy W. Simmons Family Trust and City of Calimesa. They may release this information to third parties, who may use and rely upon this information at their discretion. However, any use of or reliance upon this information by a party other than TKE Engineering, Inc. and their designates, shall be solely at the risk of such third party and without legal recourse against LOR Geotechnical Group, Inc.; its subsidiaries and affiliates; or their respective employees, officers, or directors; regardless of whether the action in which recovery of damages is sought is based upon contract, statute, or otherwise.

The content and conclusions provided by LOR in this assessment are based on information collected during our investigation, which may include, but is not limited to, visual site inspections, interviews with the site owner, regulatory agencies and other pertinent individuals, a review of available public documents, and our professional judgement based on said information at the time of preparation of this document. Any subsurface samples results and observations presented herein are considered to be representative of the area of investigation; however, soil conditions may vary between sample locations and may not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which may vary from these findings, the newly-revealed conditions must be evaluated and may invalidate the conclusions of this report.

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. LOR Geotechnical Group, Inc. (LOR) is not responsible for the accuracy of information provided by other individuals or entities which is used in this report. This report presents our professional judgement based upon data and findings identified in this report, and the interpretation of such data based upon our experience and background, and no warranty, either expressed or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations. Based on ASTM E1527-13 and AAI, certain components of this report are no longer valid after 180 days of their being performed, including interviews, visual inspection of the subject property and adjoining properties, and review of federal, tribal, state, and local government records. Once this 180-day period has expired, this report should be updated or revised to meet the requirements for continued viability under the ASTM and AAI standards.

CLOSURE

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR part 312.

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
LOR Geotechnical Group, Inc.

Mathew L. Hunt
Environmental Scientist

John P. Leuer, CE 34996
President

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Distribution: Addressee (1) and PDF via email: sledbetter@tkeengineering.com

REFERENCES

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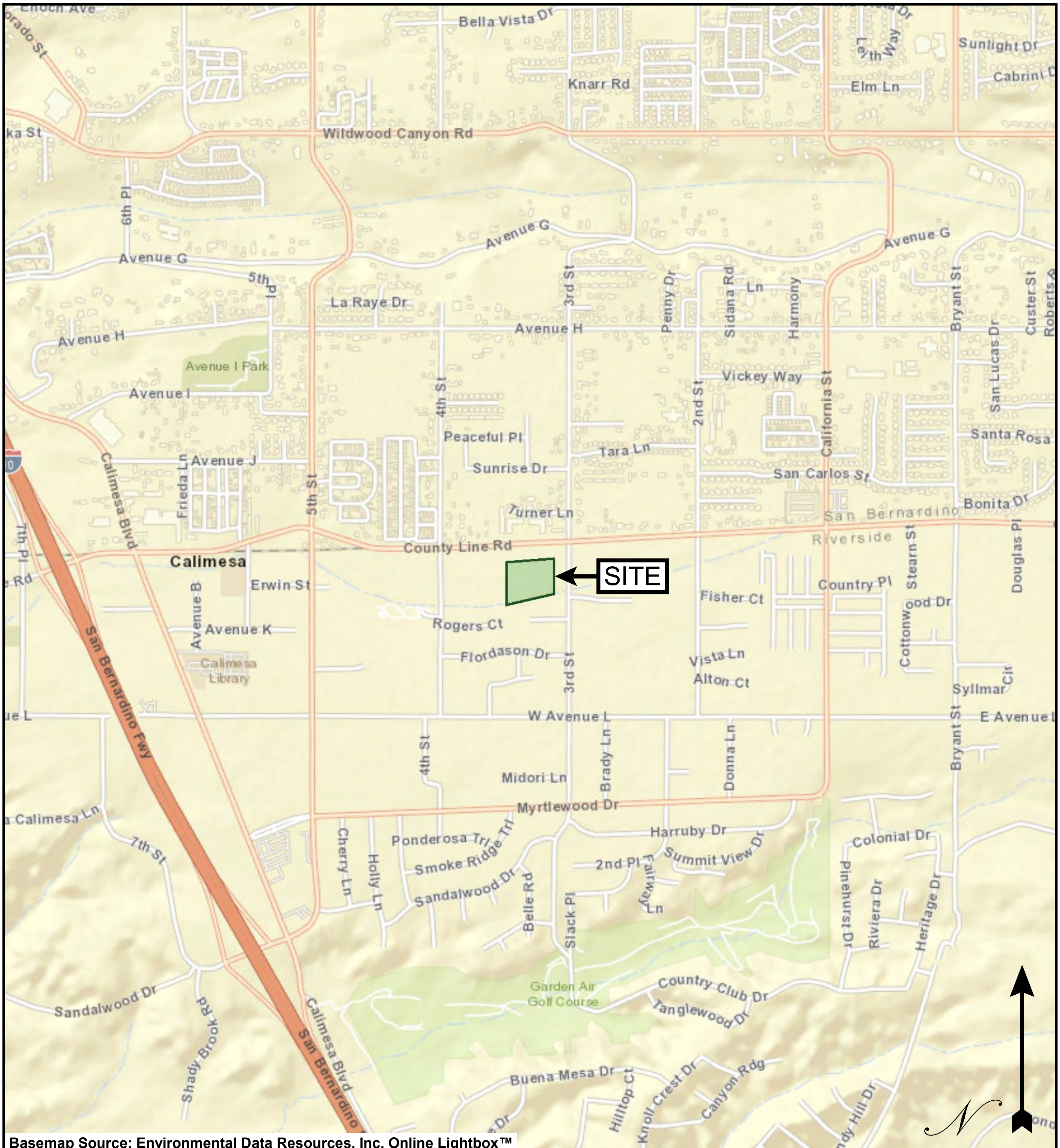
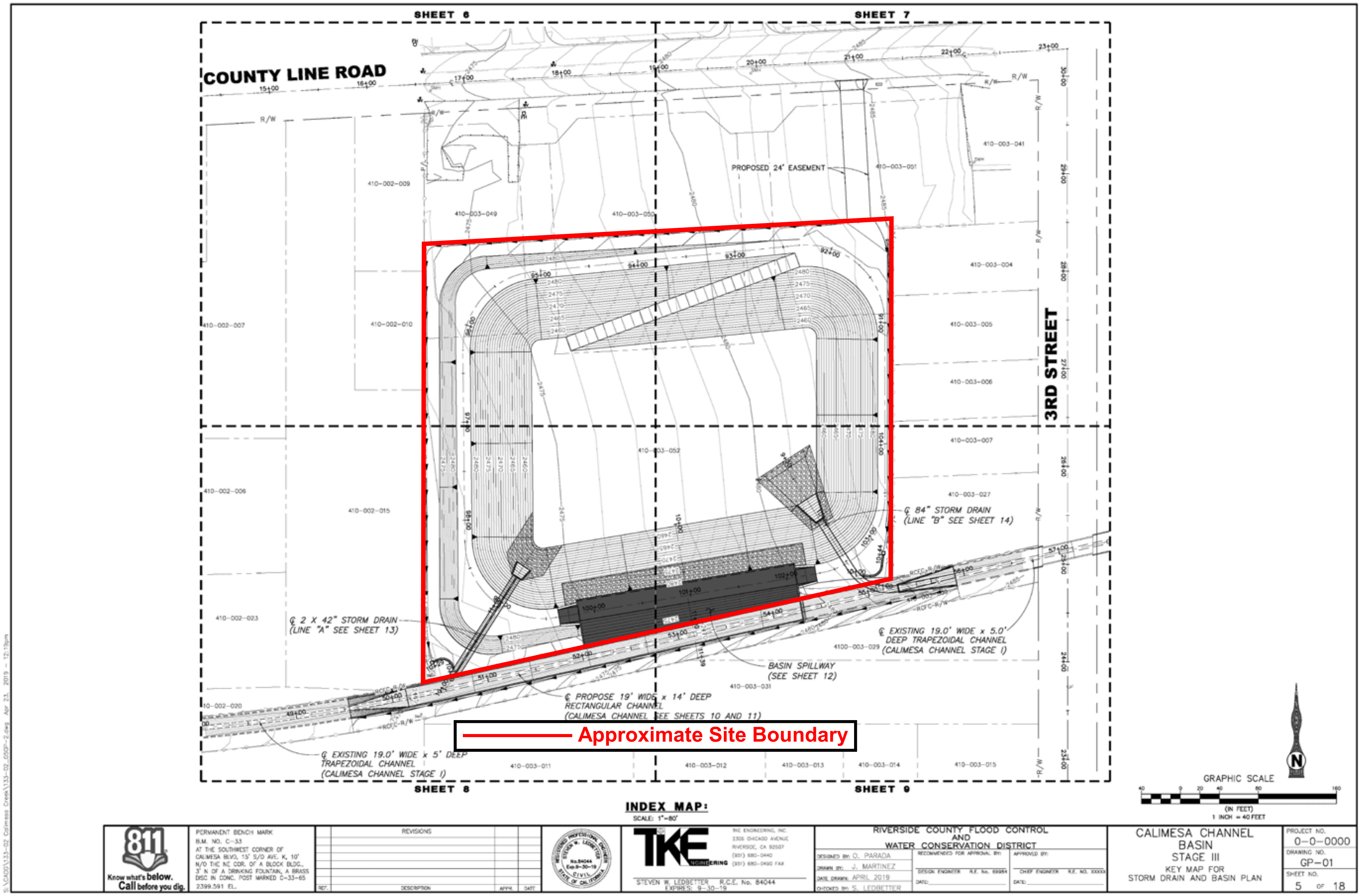
FIGURES



Basemap Source: Environmental Data Resources, Inc. Online Lightbox™

INDEX MAP

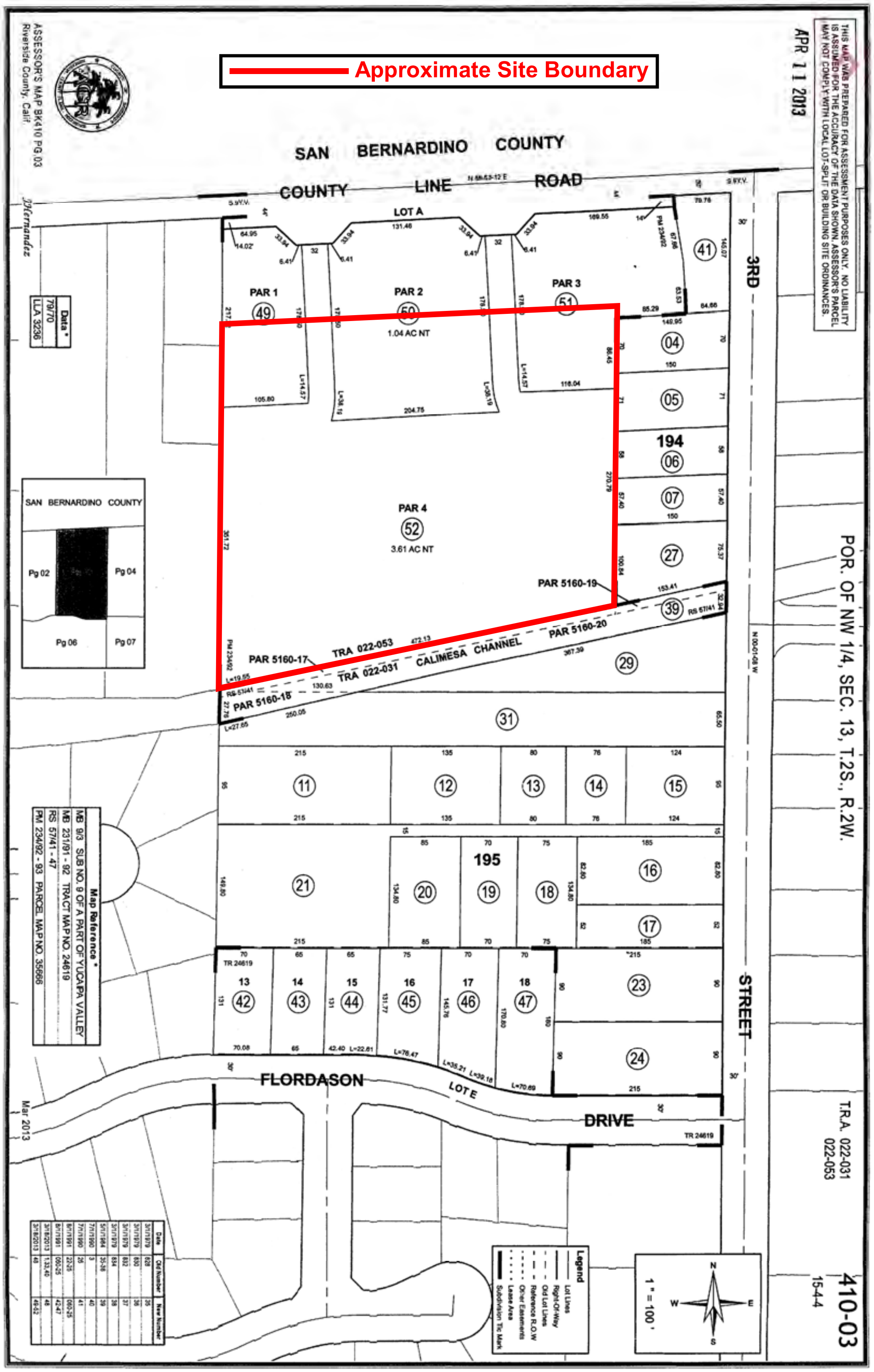
PROJECT:	**CALIMESA CHANNEL BASIN STAGE III, CALIMESA, RIVERSIDE COUNTY, CA**	**PROJECT NO.:**	**63592.2**
CLIENT:	**TKE ENGINEERING, INC.**	**FIGURE:**	**1**
LOR Geotechnical Group, Inc.		**DATE:**	**NOVEMBER 2019**
		SCALE:	**1" ~ 1,350'**



Basemap Source: TKE Engineering, Inc.

STORM DRAIN AND BASIN PLAN

PROJECT: CALIMESA CHANNEL BASIN STAGE III, CALIMESA, RIVERSIDE COUNTY, CA	PROJECT NO.: 63592.2
CLIENT: TKE ENGINEERING, INC.	FIGURE: 2
LOR Geotechnical Group, Inc.	DATE: NOVEMBER 2019
	APPROX. SCALE: 1" = 150'



Basemap Source: ParcelQuest Lite (https://assr.parcelquest.com/Home)

ASSESSOR'S PARCEL MAP

PROJECT:	**CALIMESA CHANNEL BASIN STAGE III, CALIMESA, RIVERSIDE COUNTY, CA**	**PROJECT NO.:**	**63592.2**
CLIENT:	**TKE ENGINEERING, INC.**	**FIGURE:**	**3**
LOR Geotechnical Group, Inc.		**DATE:**	**NOVEMBER 2019**
		SCALE:	**1" ~ 200'**

Aerial Image Source: Google Earth Pro Computer Program (Aerial Image Date: December 2, 2018)

RECENT COLOR AERIAL PHOTOGRAPH

PROJECT:	CALIMESA CHANNEL BASIN STAGE III, CALIMESA, RIVERSIDE COUNTY, CA	PROJECT NO.:	63592.2
CLIENT:	TKE ENGINEERING, INC.	FIGURE:	4
LOR Geotechnical Group, Inc.		DATE:	NOVEMBER 2019
		APPROX. SCALE:	1" = 285'

APPENDIX A

Completed ASTM E1527-13 User Questionnaire

E1527–13

USER QUESTIONNAIRE

INTRODUCTION

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "*Brownfields Amendments*"), the *user* must provide the following information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that "*all appropriate inquiry*" is not complete.

(1.) Environmental liens that are filed or recorded against the property (40 CFR 312.25).
Are you aware of any environmental cleanup liens against the *property* that are filed or recorded under federal, tribal, state or local law? NONE KNOWN

(2.) Activity and use limitations that are in place on the property or that have been filed or recorded against the property (40 CFR 312.26(a)(1)(v) and (vi)).
Are you aware of any activity and land use limitations (AULs), such as *engineering controls*, land use restrictions, or *institutional controls* that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state, or local law?

NONE KNOWN

(3.) Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).
As the user of this Phase I Environmental Site Assessment (ESA) do you have any specialized knowledge or experience related to the *property* or nearby properties? For example, are you involved in the same line of business as the current or former *occupants* of the *property* or an adjoining *property* so that you would have specialized knowledge of the chemicals and processes used by this type of business? NO

(4.) Relationship of the purchase price to the fair market value of the *property* if it were not contaminated (40 CFR 312.29).

Does the purchase price being paid for this *property* reasonably reflect the fair market value of the *property*? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the *property*?

N/A

(5.) Commonly known or *reasonably ascertainable* information about the *property* (40 CFR 312.30).

Are you aware of commonly known or reasonably ascertainable information about the *property* that would help the *environmental professional* to identify conditions indicative of releases or threatened releases? For example, as *user*, (a.) Do you know the past uses of the *property*? (b.) Do you know of specific chemicals that are present or once were present at the *property*? (c.) Do you know of spills or other chemical releases that have taken place at the *property*? (d.) Do you know of any environmental cleanups that have taken place at the *property*?

NONE KNOWN

6.) The degree of obviousness of the presence of likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

As the *user* of this *ESA*, based on your knowledge and experience related to the *property*, are there any *obvious* indicators that point to the presence or likely presence of contamination at the *property*? NO

In addition to the above information, certain information should be collected, if available, and provided to the *environmental professional* selected to conduct the Phase I ESA. This information is intended to assist the *environmental professional*, but is not necessarily required to qualify for one of the LLPs. The information includes:

(a) the reason why the Phase I ESA is required and/or is being performed:

CITY OF CALIMESA WISHES TO PURCHASE

(b) the type of *property* and type of *property* transaction, for example, sale, purchase, exchange, etc.: SALE/EXCHANGE OF VACANT LAND

(c) the complete and correct address for the *property* (a map or other documentation showing the *property* location and boundaries is helpful): NO ADDRESS ASSIGNED WEST OF 301 COUNTY LINE ROAD

(d) the scope of services desired for the Phase I ESA (including whether any parties to the *property* transaction may have a required standard scope of services on whether any considerations beyond the requirements of Practice E1527 are to be considered): CONTACT PUBLIC WORKS DIRECTOR CITY OF CALIMESA/ CITY MANAGER

(e) identification of all parties who will rely on the Phase I ESA report: SELLER & BUYER OF PROPERTY

(f) identification of the site contact and how the contact can be reached:
E.WAYNE SIMMONS
909-795-8928 OFFICE 909-229-1180 CELL

(g) any special terms and conditions which must be agreed upon by the *environmental professional*: NONE KNOWN

(h) any other knowledge or experience with the property that may be pertinent to the *environmental professional* (for example, copies of any available prior *environmental site assessment reports*, documents, correspondence, etc., concerning the *property* and its environmental condition):
NONE KNOWN

Calimesa Channel Basin Stage III
(Portions of APNs 410-030-049 through -052)
Calimesa, California

LOR Project No. 63592.2

ADDITIONAL SPACE FOR ANSWERS (if needed):

The *User* Questionnaire was completed by:

Name: E WAYNE SIMMONS	
Title: SELLERS AGENT	
Firm: BILLY W SIMMONS FAMILY TRUST	
Address: 1025 CALIMESA BLVD #8 CALIMESA CA 92320	
Phone: 909-795-8928	
Date: 11/21/19	
User's relationship to the *property*:	SELLER/BUYERS

Copies of the completed questionnaire will be filed at:

LOR Geotechnical Group, Inc.; 6121 Quail Valley Court; Riverside, California 92507

Copies of the completed questionnaire may be mailed or delivered to:

LOR Geotechnical Group, Inc.; 6121 Quail Valley Court; Riverside, California 92507

User represents that to the best of their knowledge, the above statements and facts are true and correct, and to the best of their actual knowledge, no material facts have been suppressed or misstated.

Signature: [signature] Date: 11/21/19

APPENDIX B

EDR Sanborn Map Report

Calimesa Channel Basin Stage III

West County Line Road/3rd Street

Calimesa, CA 92320

Inquiry Number: 5842101.3

October 24, 2019

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

10/24/19

Site Name:	**Client Name:**
Calimesa Channel Basin Stage	LOR Geotechnical Group, Inc.
West County Line Road/3rd Str	6121 Quail Valley Court
Calimesa, CA 92320	Riverside, CA 92507
EDR Inquiry # 5842101.3	Contact: Mathew L. Hunt

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by LOR Geotechnical Group, Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 686F-4855-A696

PO # 63592.2

Project Calimesa Channel Basin Stage 3

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 686F-4855-A696

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

LOR Geotechnical Group, Inc. (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

APPENDIX C

EDR Historical Topographic Map Report

Calimesa Channel Basin Stage III

West County Line Road/3rd Street

Calimesa, CA 92320

Inquiry Number: 5842101.4

October 24, 2019

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

10/24/19

Site Name:	Client Name:
Calimesa Channel Basin Stage	LOR Geotechnical Group, Inc.
West County Line Road/3rd Str	6121 Quail Valley Court
Calimesa, CA 92320	Riverside, CA 92507
EDR Inquiry # 5842101.4	Contact: Mathew L. Hunt

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by LOR Geotechnical Group, Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	63592.2	**Latitude:**	34.003241 34° 0' 12" North
Project:	Calimesa Channel Basin Stage	**Longitude:**	-117.048871 -117° 2' 56" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	495487.04
		UTM Y Meters:	3762516.41
		Elevation:	2478.19' above sea level

Maps Provided:

2012	1943
1996	1942
1988	1901
1979, 1980	1899
1973	
1967	
1954	
1953, 1954	

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

El Casco
2012
7.5-minute, 24000

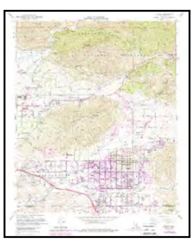
Yucaipa
2012
7.5-minute, 24000

1996 Source Sheets

El Casco
1996
7.5-minute, 24000
Aerial Photo Revised 1996

Yucaipa
1996
7.5-minute, 24000
Aerial Photo Revised 1994

1988 Source Sheets



Yucaipa
1988
7.5-minute, 24000
Aerial Photo Revised 1985

1979, 1980 Source Sheets

El Casco
1979
7.5-minute, 24000
Aerial Photo Revised 1976

Yucaipa
1980
7.5-minute, 24000
Aerial Photo Revised 1978

Topo Sheet Key

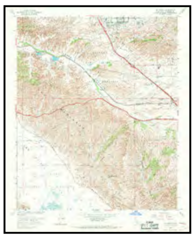
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1973 Source Sheets

Yucaipa
1973
7.5-minute, 24000
Aerial Photo Revised 1973

1967 Source Sheets

Yucaipa
1967
7.5-minute, 24000
Aerial Photo Revised 1966



El Casco
1967
7.5-minute, 24000
Aerial Photo Revised 1966

1954 Source Sheets

Redlands
1954
15-minute, 62500
Aerial Photo Revised 1952

1953, 1954 Source Sheets

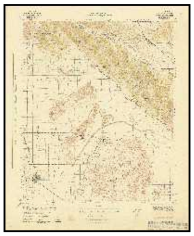
El Casco
1953
7.5-minute, 24000
Aerial Photo Revised 1951

Yucaipa
1954
7.5-minute, 24000
Aerial Photo Revised 1952

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1943 Source Sheets



PERRIS
1943
15-minute, 62500

1942 Source Sheets

Perris
1942
15-minute, 62500
Aerial Photo Revised 1939

1901 Source Sheets

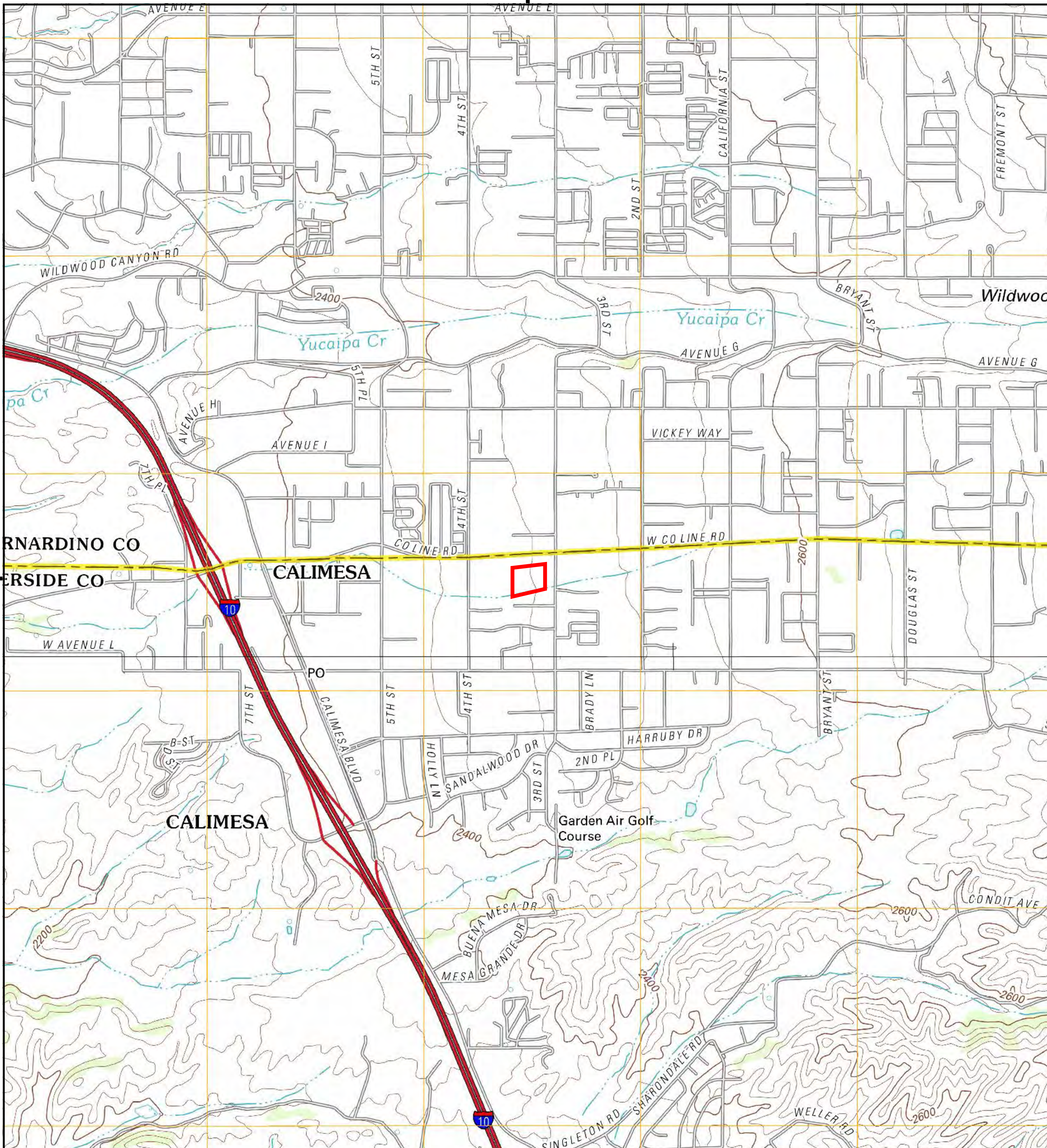
Redlands
1901
15-minute, 62500

1899 Source Sheets

Redlands
1899
15-minute, 62500

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE W E SW S SE

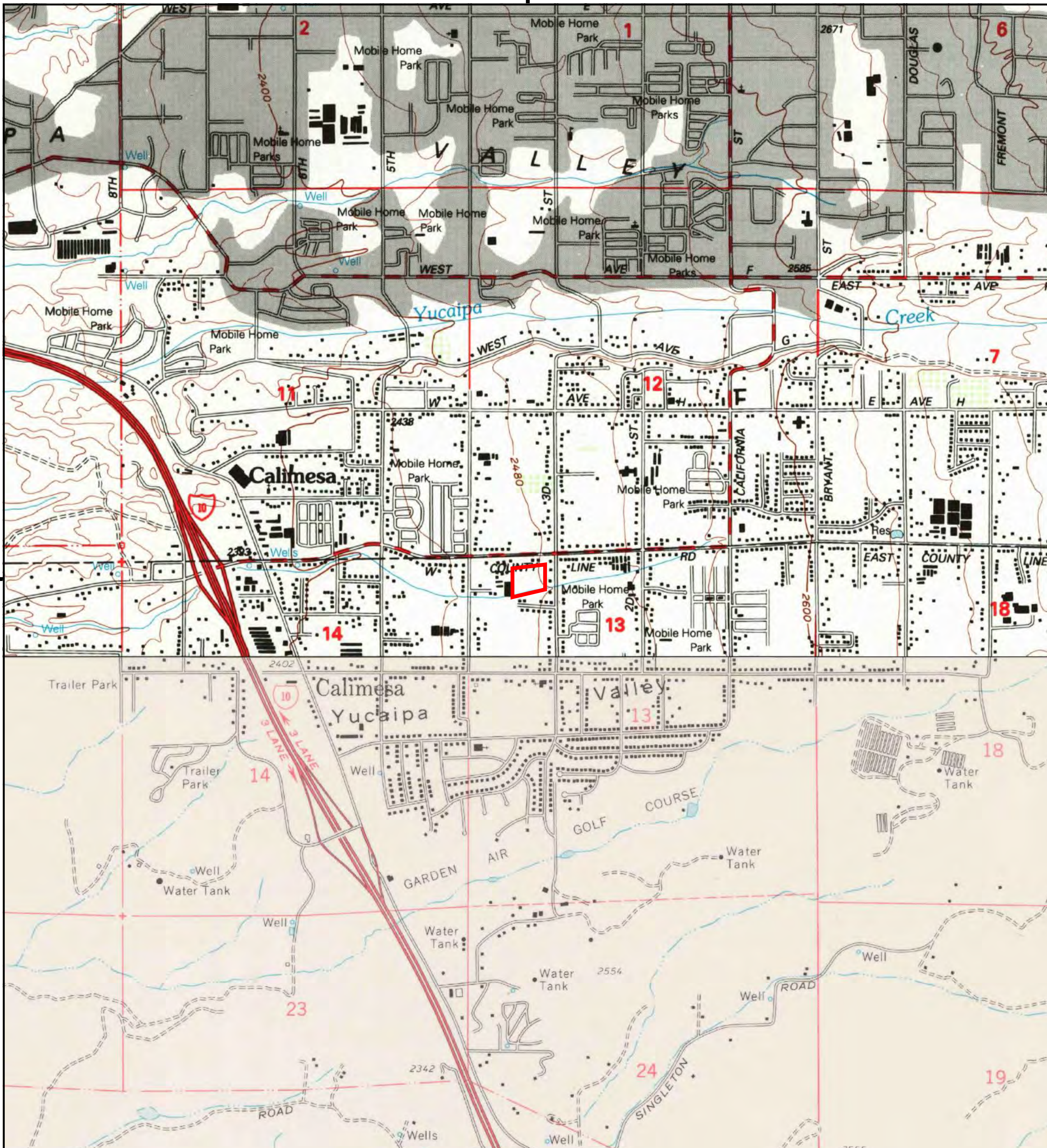
TP, Yucaipa, 2012, 7.5-minute
S, El Casco, 2012, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1996



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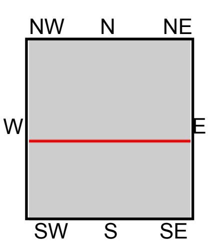


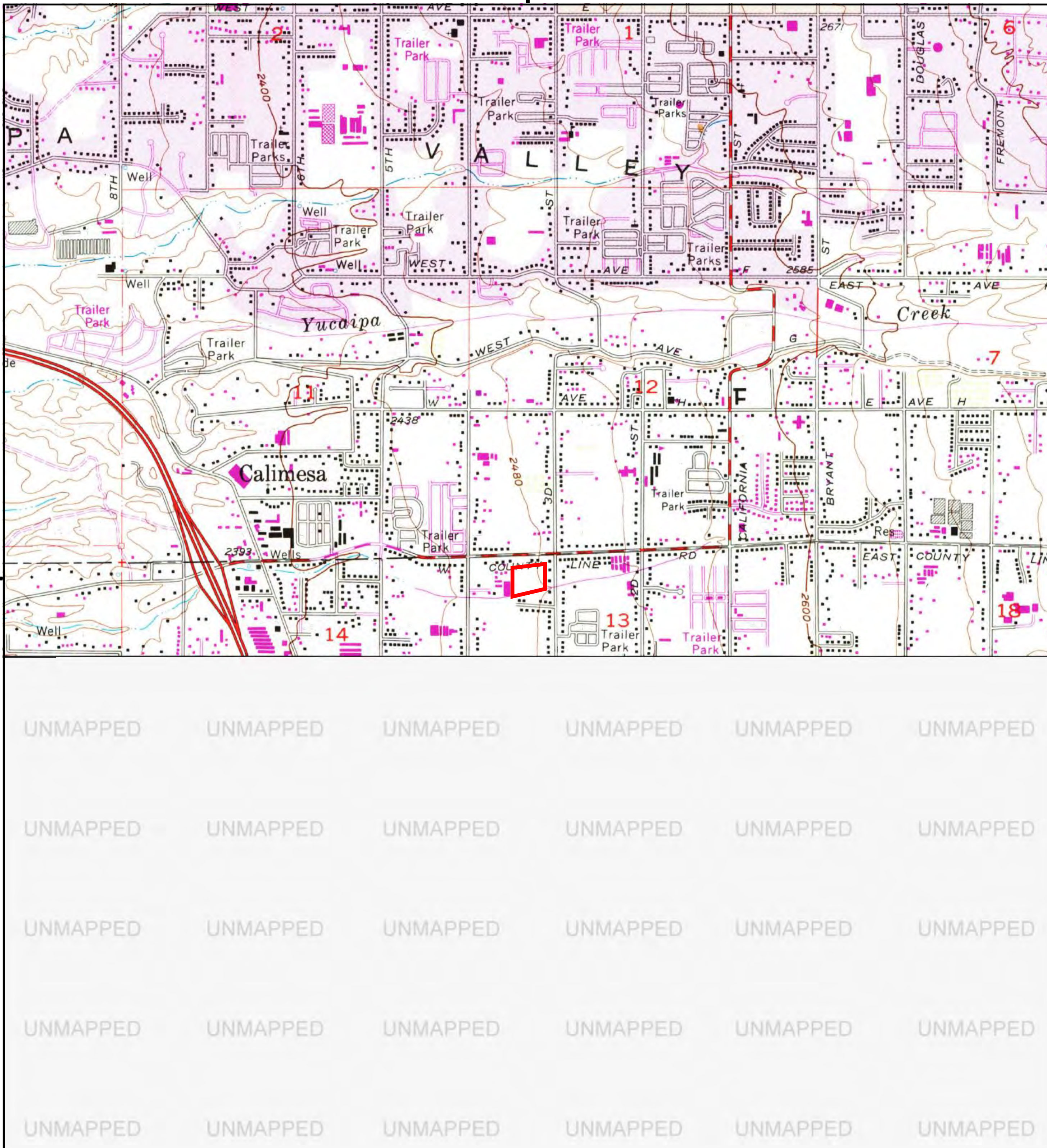
TP, Yucaipa, 1996, 7.5-minute
S, El Casco, 1996, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1988



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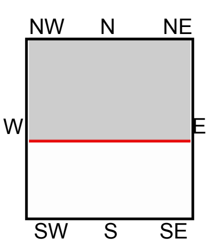
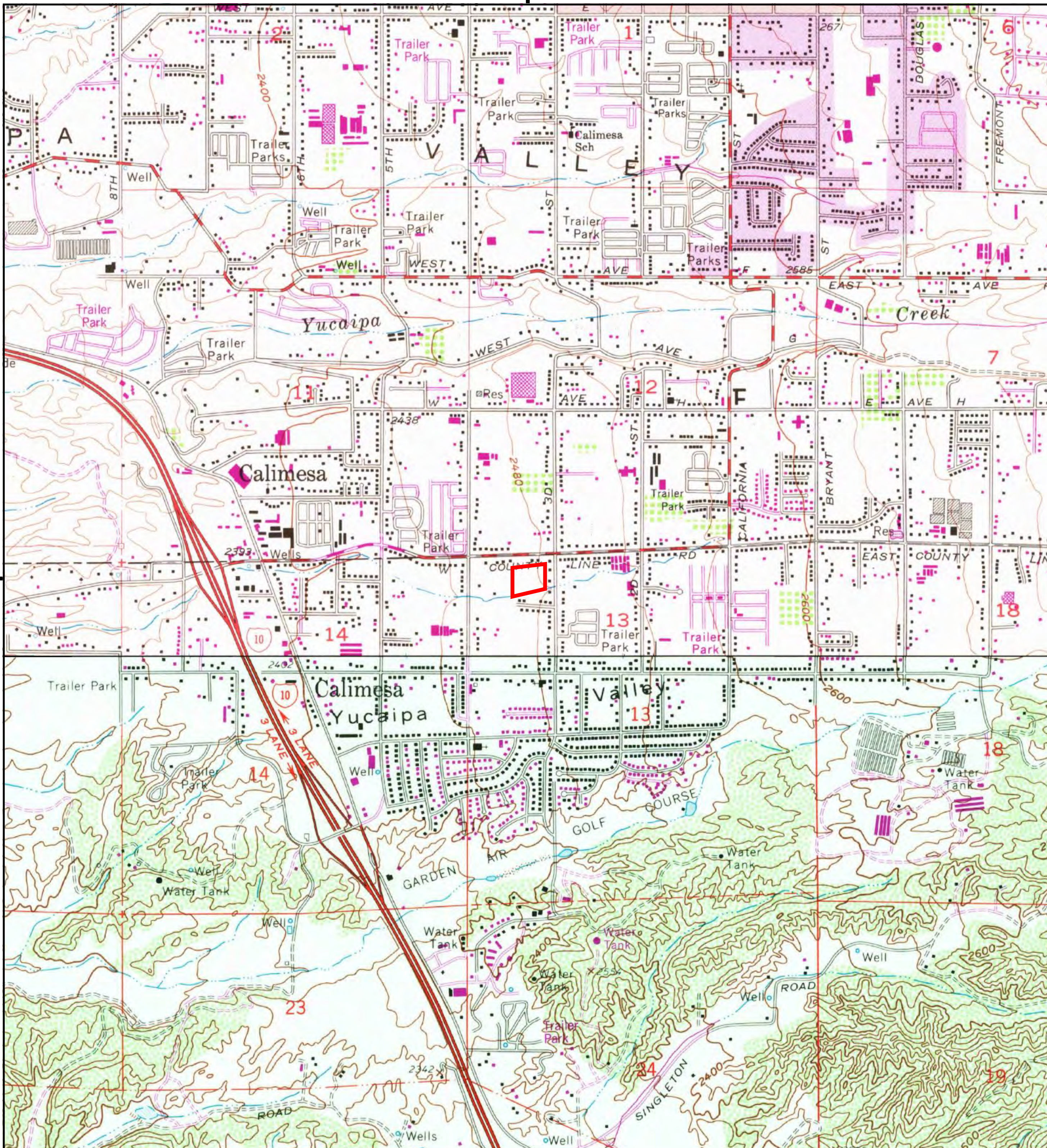


TP, Yucaipa, 1988, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

Historical Topo Map

1979, 1980



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

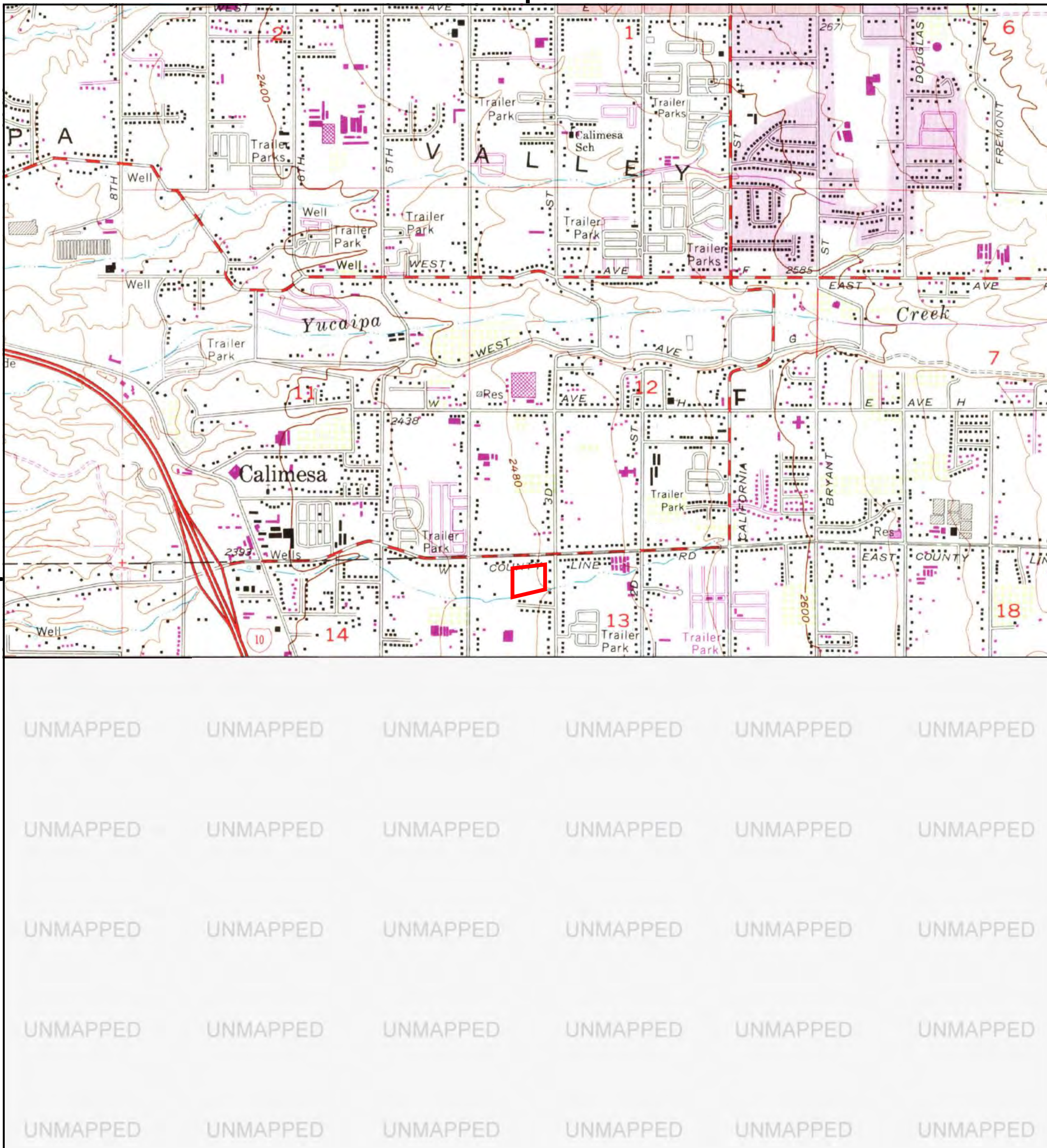
TP, Yucaipa, 1980, 7.5-minute
S, El Casco, 1979, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1973



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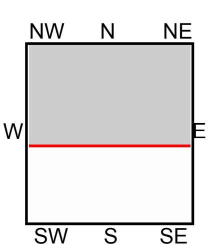
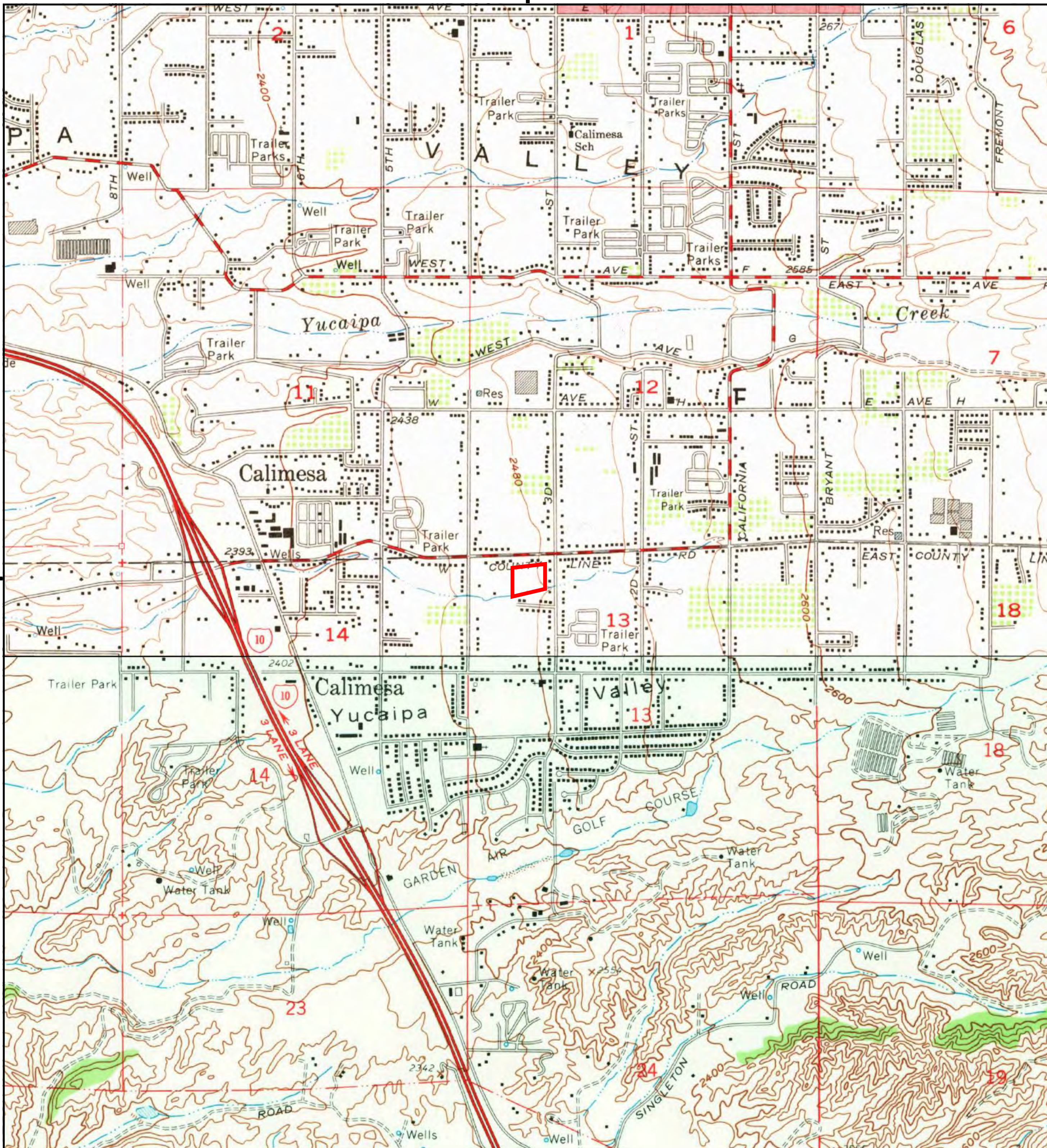


TP, Yucaipa, 1973, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

Historical Topo Map

1967



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NW N NE W E SW S SE

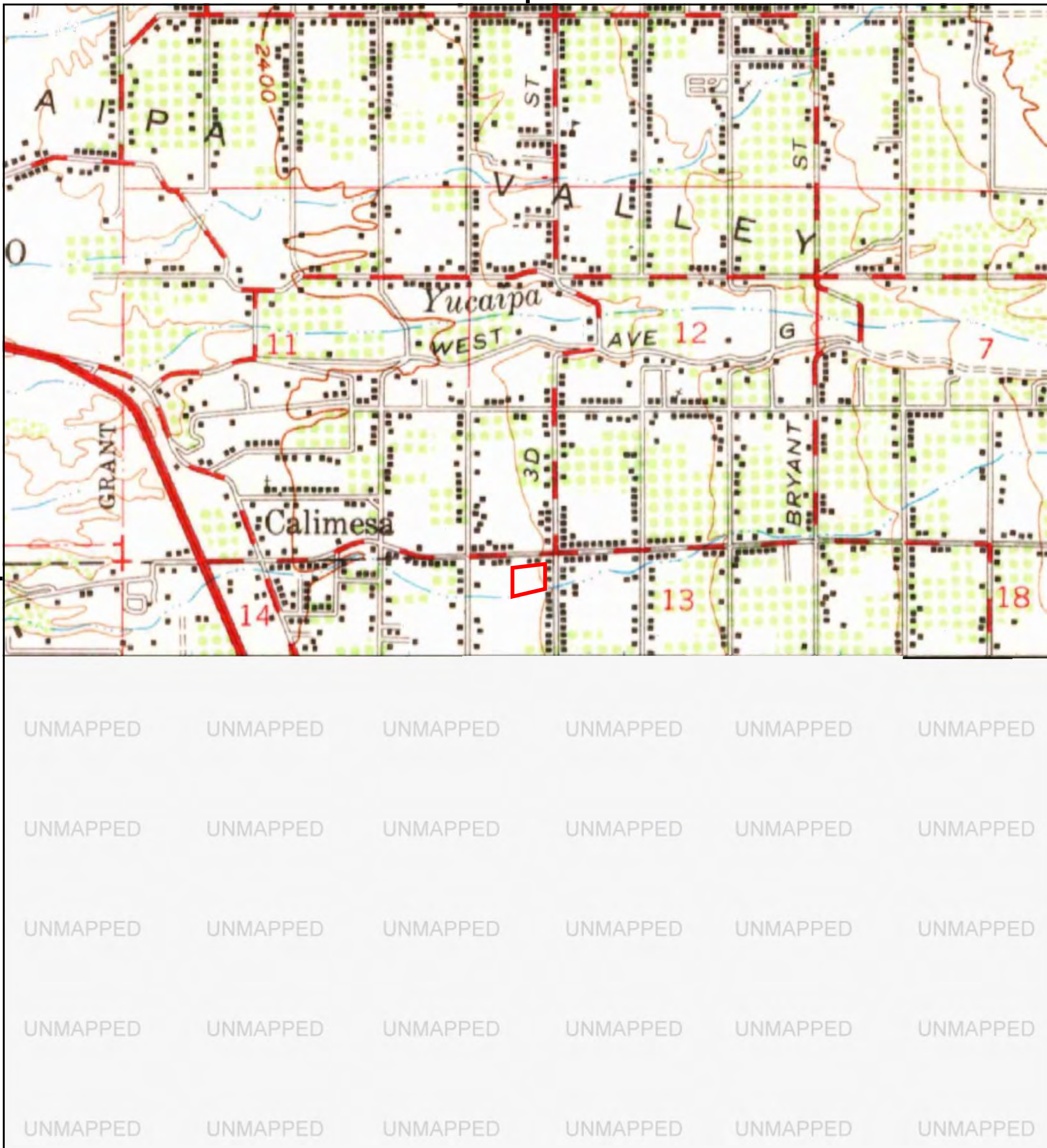
TP, Yucaipa, 1967, 7.5-minute
S, El Casco, 1967, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1954



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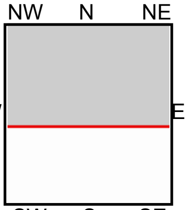


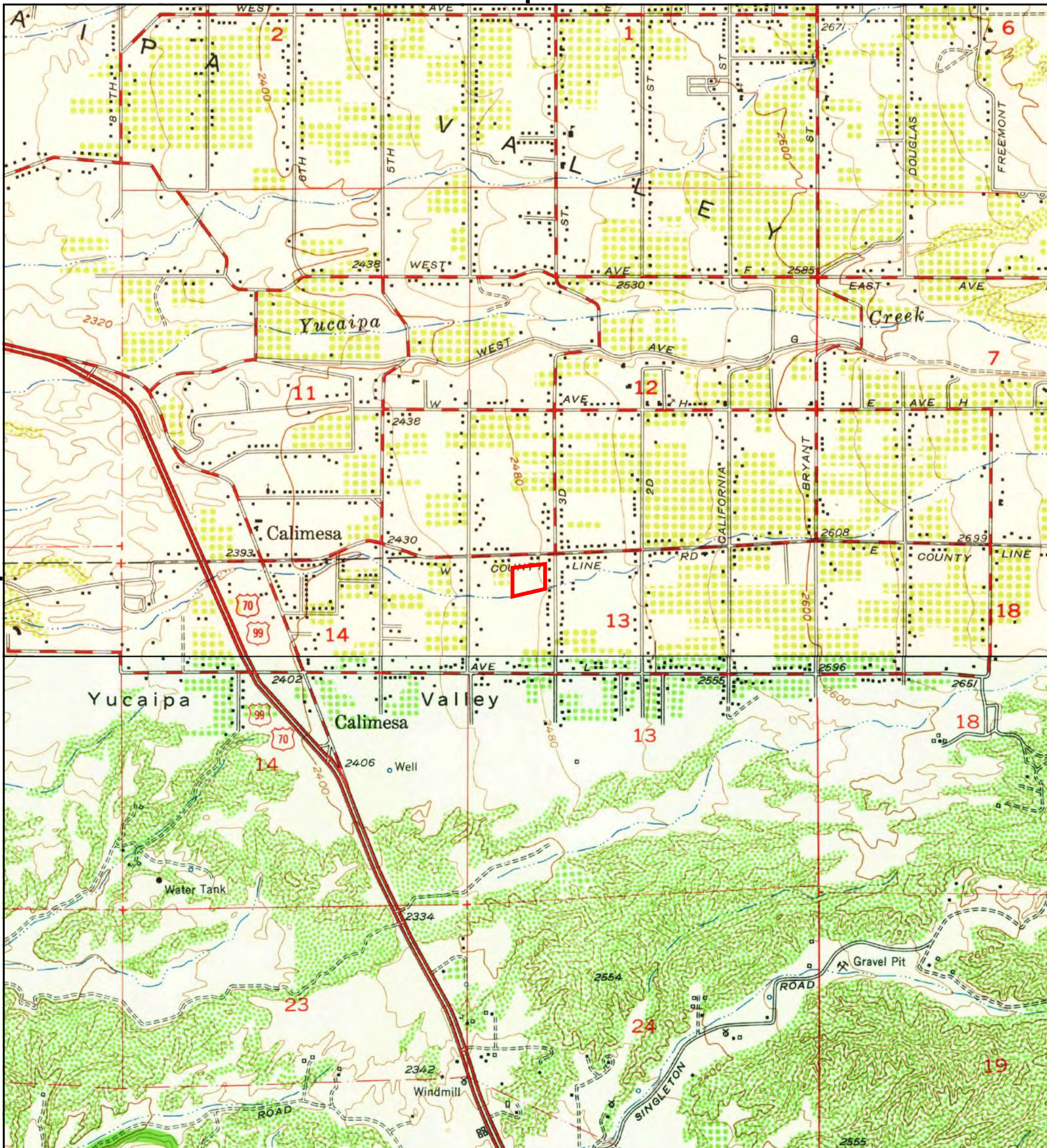
TP, Redlands, 1954, 15-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1953, 1954



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NW N NE
W E
SW S SE

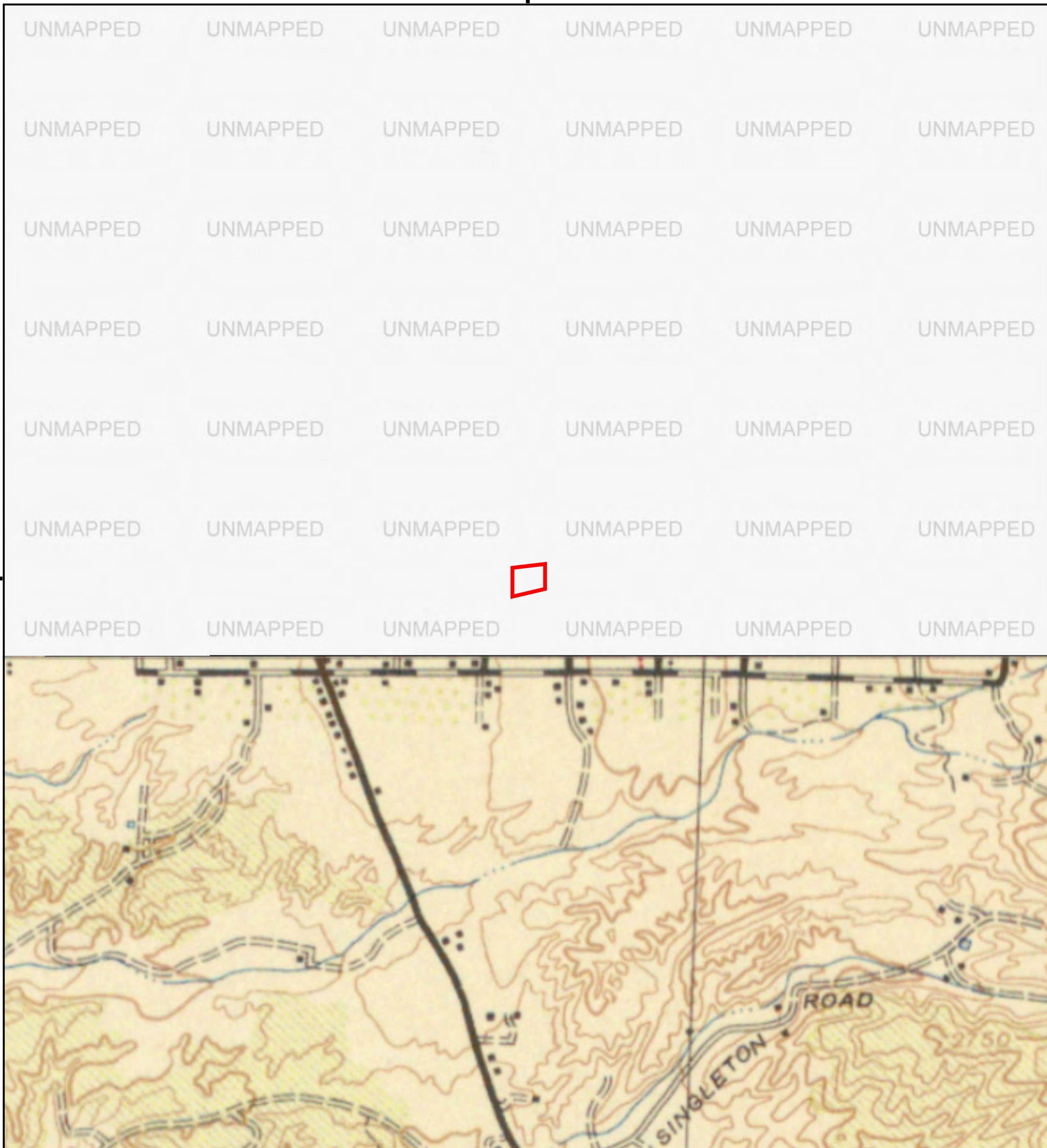
TP, Yucaipa, 1954, 7.5-minute
S, El Casco, 1953, 7.5-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

Historical Topo Map

1943



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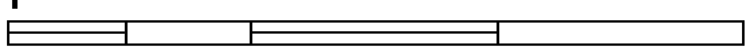
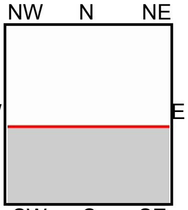


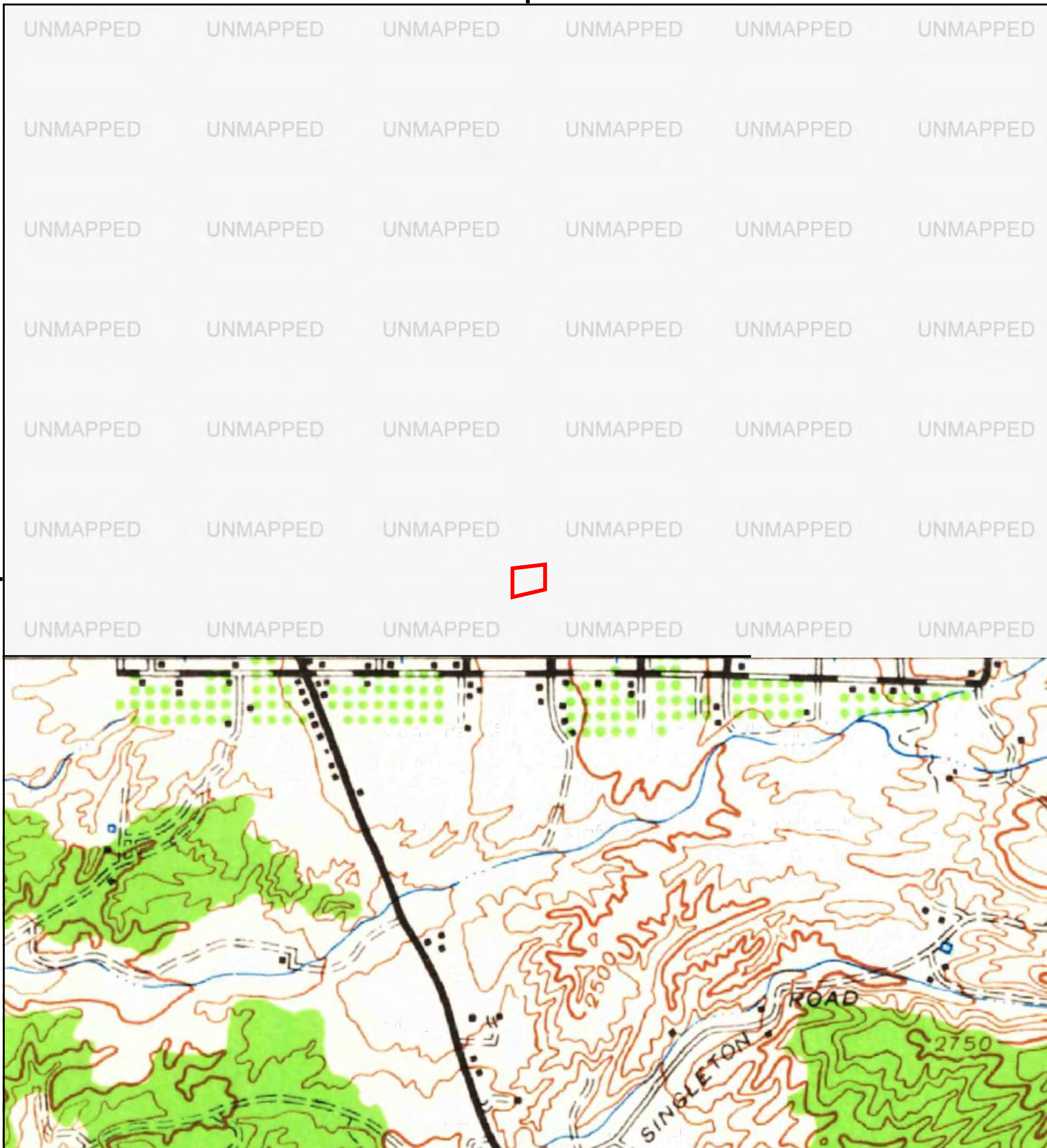


SW, PERRIS, 1943, 15-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

Historical Topo Map

1942



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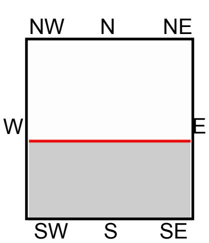
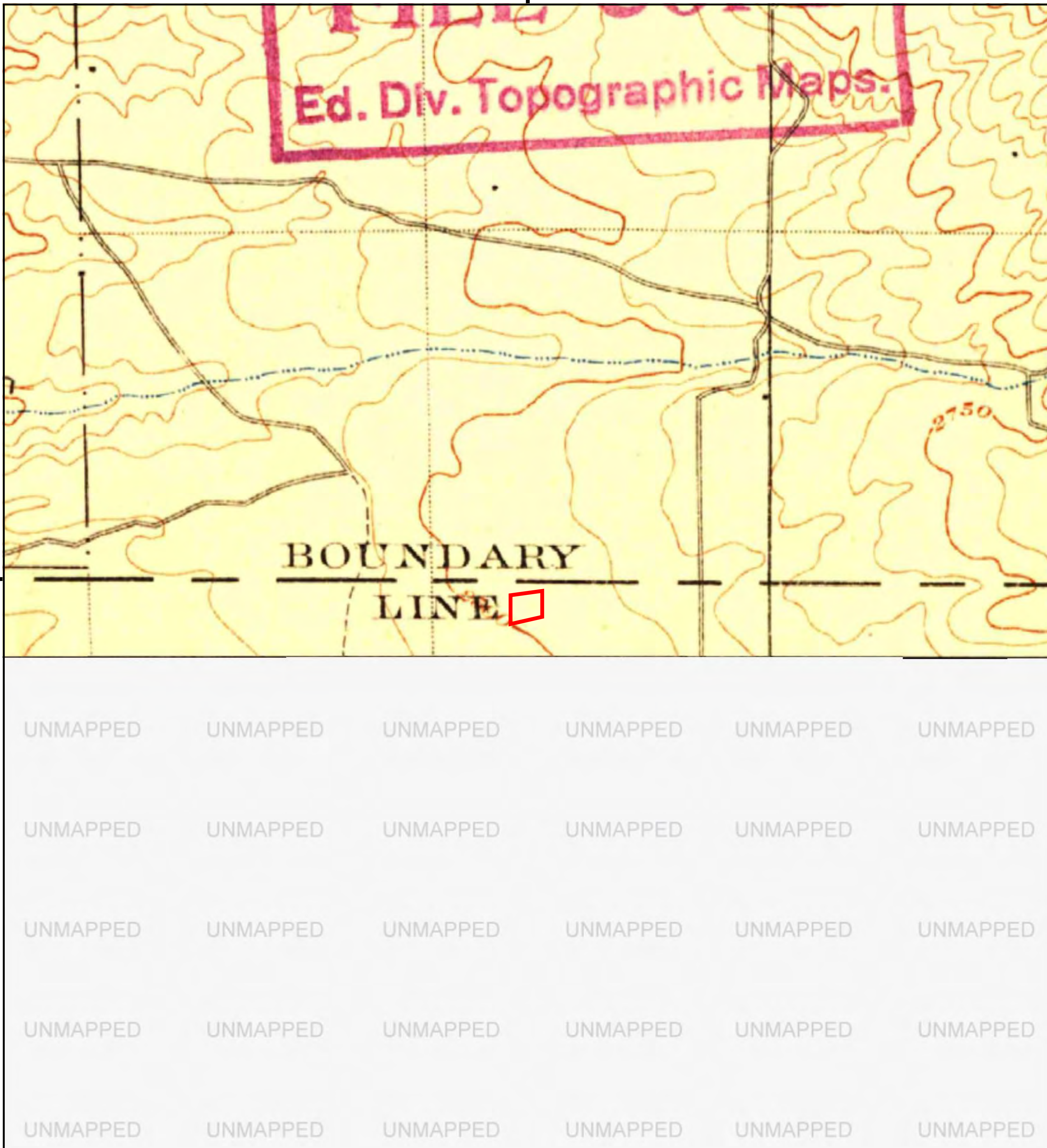


SW, Perris, 1942, 15-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

Historical Topo Map

1901



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

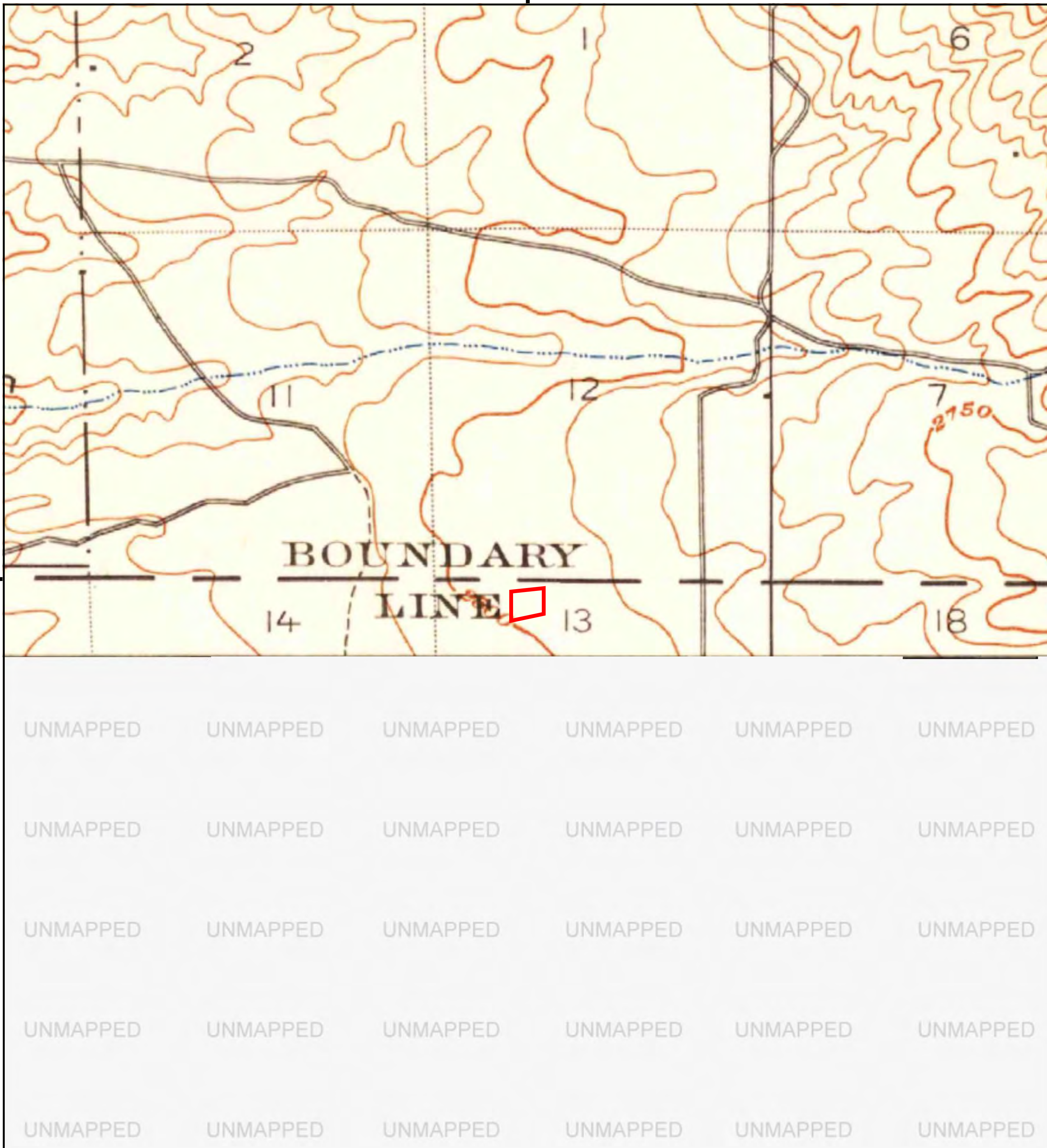
TP, Redlands, 1901, 15-minute

SITE NAME: Calimesa Channel Basin Stage III
ADDRESS: West County Line Road/3rd Street
Calimesa, CA 92320
CLIENT: LOR Geotechnical Group, Inc.

N

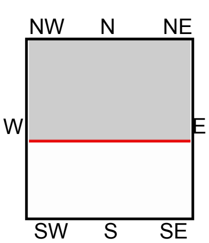
Historical Topo Map

1899



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



TP, Redlands, 1899, 15-minute

SITE NAME:	Calimesa Channel Basin Stage III
ADDRESS:	West County Line Road/3rd Street Calimesa, CA 92320
CLIENT:	LOR Geotechnical Group, Inc.

N

APPENDIX D

EDR Historical Aerial Photographs

Calimesa Channel Basin Stage III

West County Line Road/3rd Street

Calimesa, CA 92320

Inquiry Number: 5842101.8

October 24, 2019

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

10/24/19

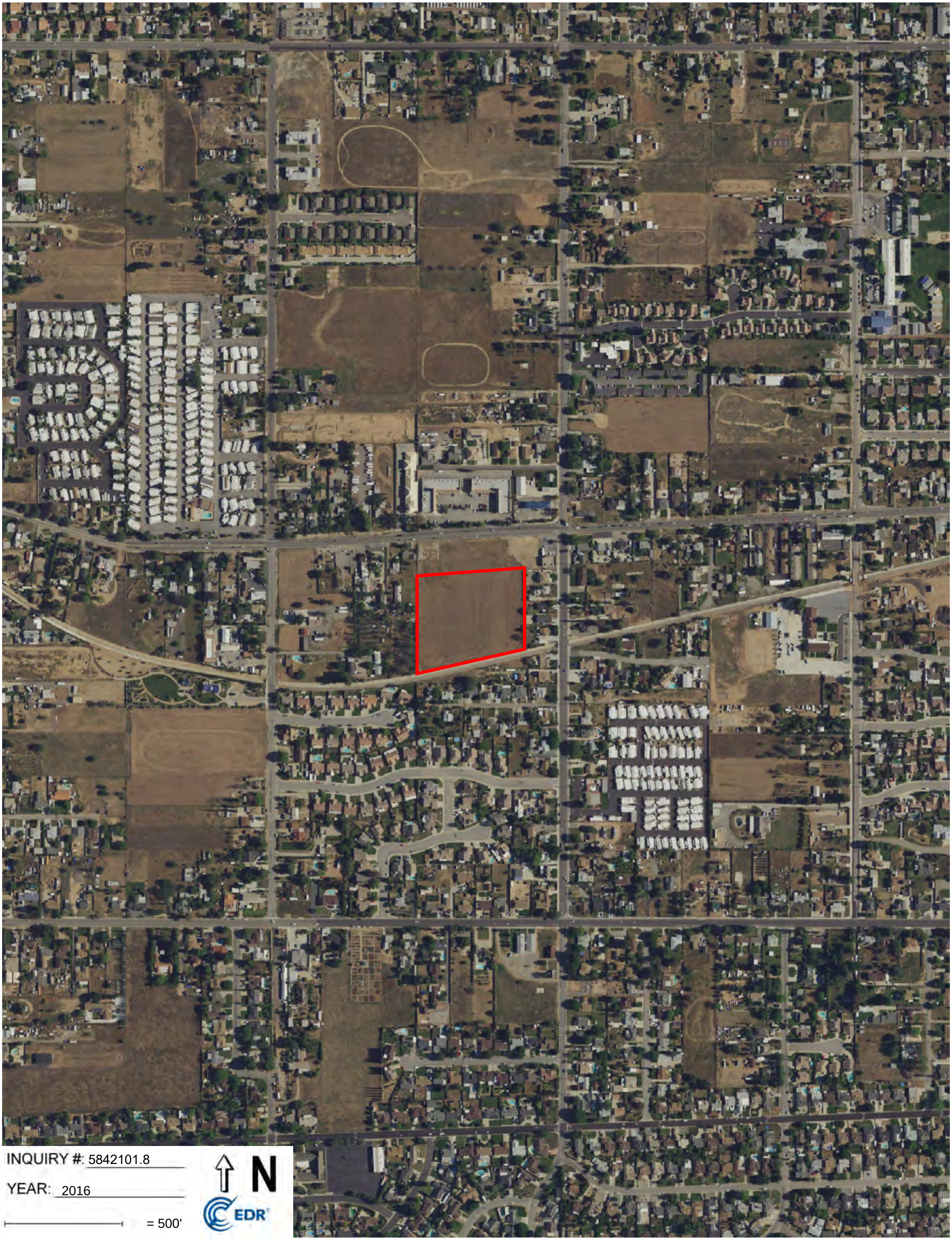
Site Name:	**Client Name:**
Calimesa Channel Basin Stage	LOR Geotechnical Group, Inc.
West County Line Road/3rd Str	6121 Quail Valley Court
Calimesa, CA 92320	Riverside, CA 92507
EDR Inquiry # 5842101.8	Contact: Mathew L. Hunt

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

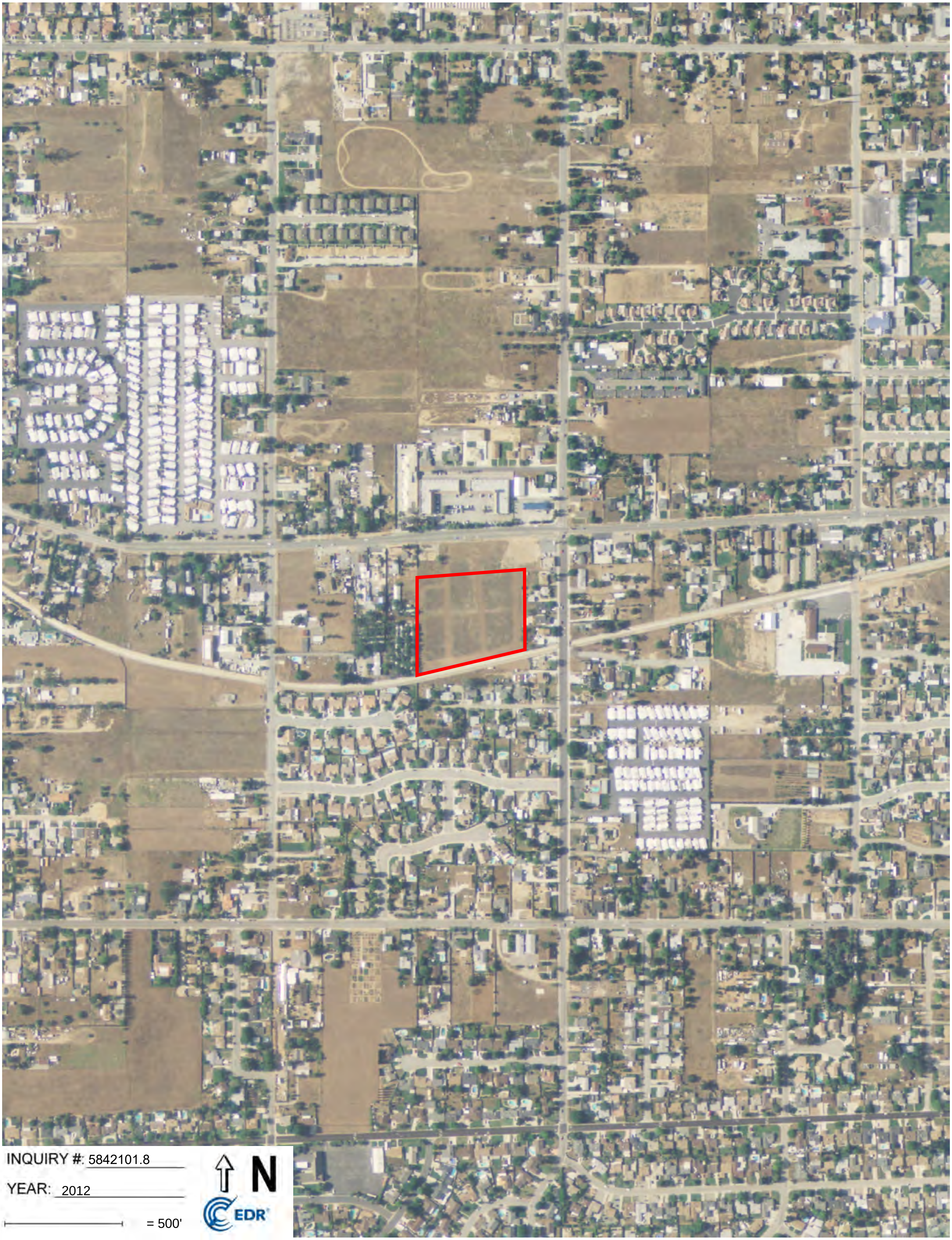
Search Results:

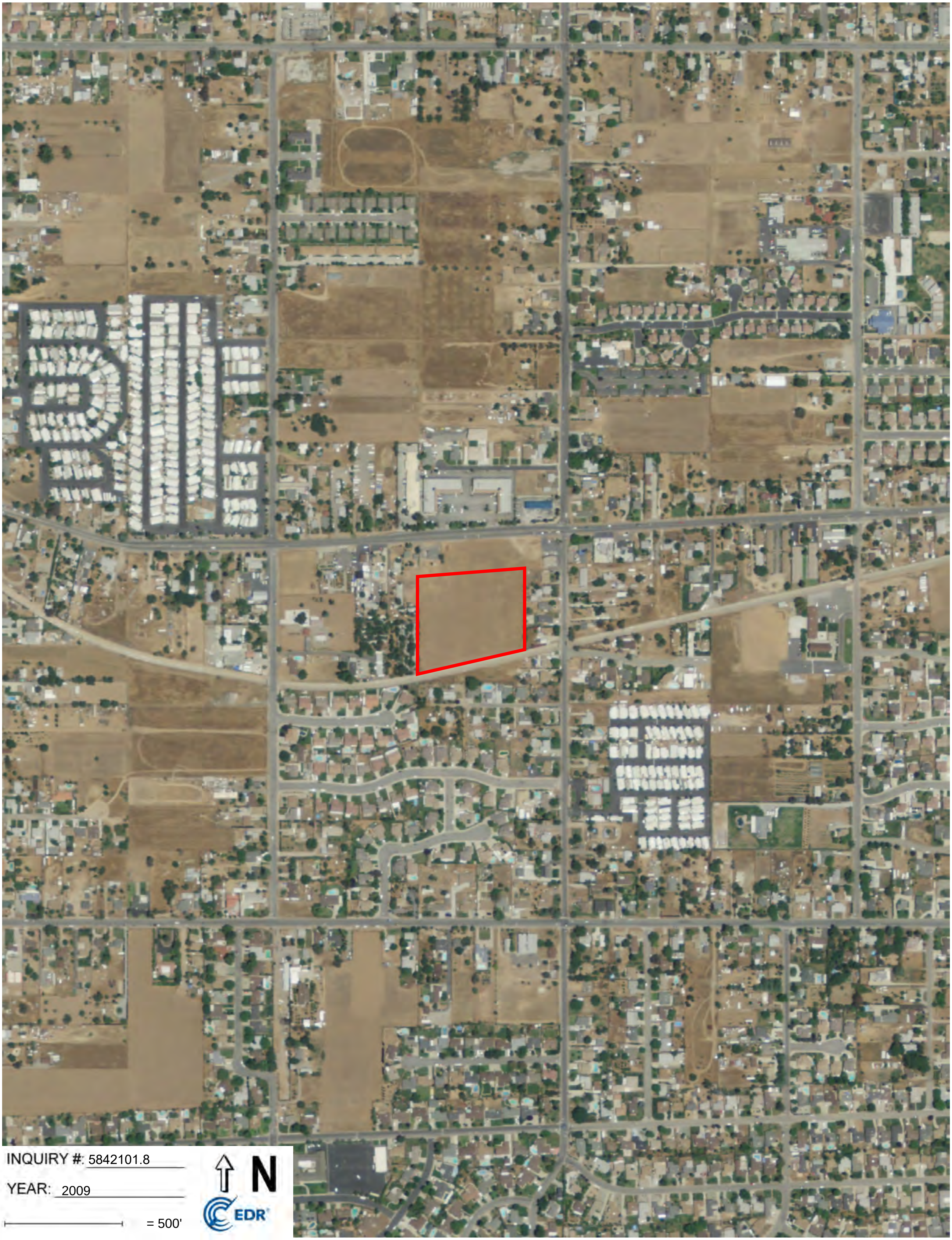
Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1995	1"=500'	Acquisition Date: October 02, 1995	USGS/DOQQ
1990	1"=500'	Flight Date: August 29, 1990	USDA
1989	1"=500'	Flight Date: August 14, 1989	USDA
1985	1"=500'	Flight Date: September 02, 1985	USDA
1975	1"=500'	Flight Date: August 01, 1975	USGS
1967	1"=500'	Flight Date: May 09, 1967	USDA
1961	1"=500'	Flight Date: July 08, 1961	USDA
1959	1"=500'	Flight Date: October 16, 1959	USDA
1953	1"=500'	Flight Date: February 16, 1953	USDA
1949	1"=500'	Flight Date: May 23, 1949	USDA
1938	1"=500'	Flight Date: June 14, 1938	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.



INQUIRY #: 5842101.8
YEAR: 2016
= 500'
N
EDR


INQUIRY #: 5842101.8
YEAR: 2012
= 500'
N
EDR

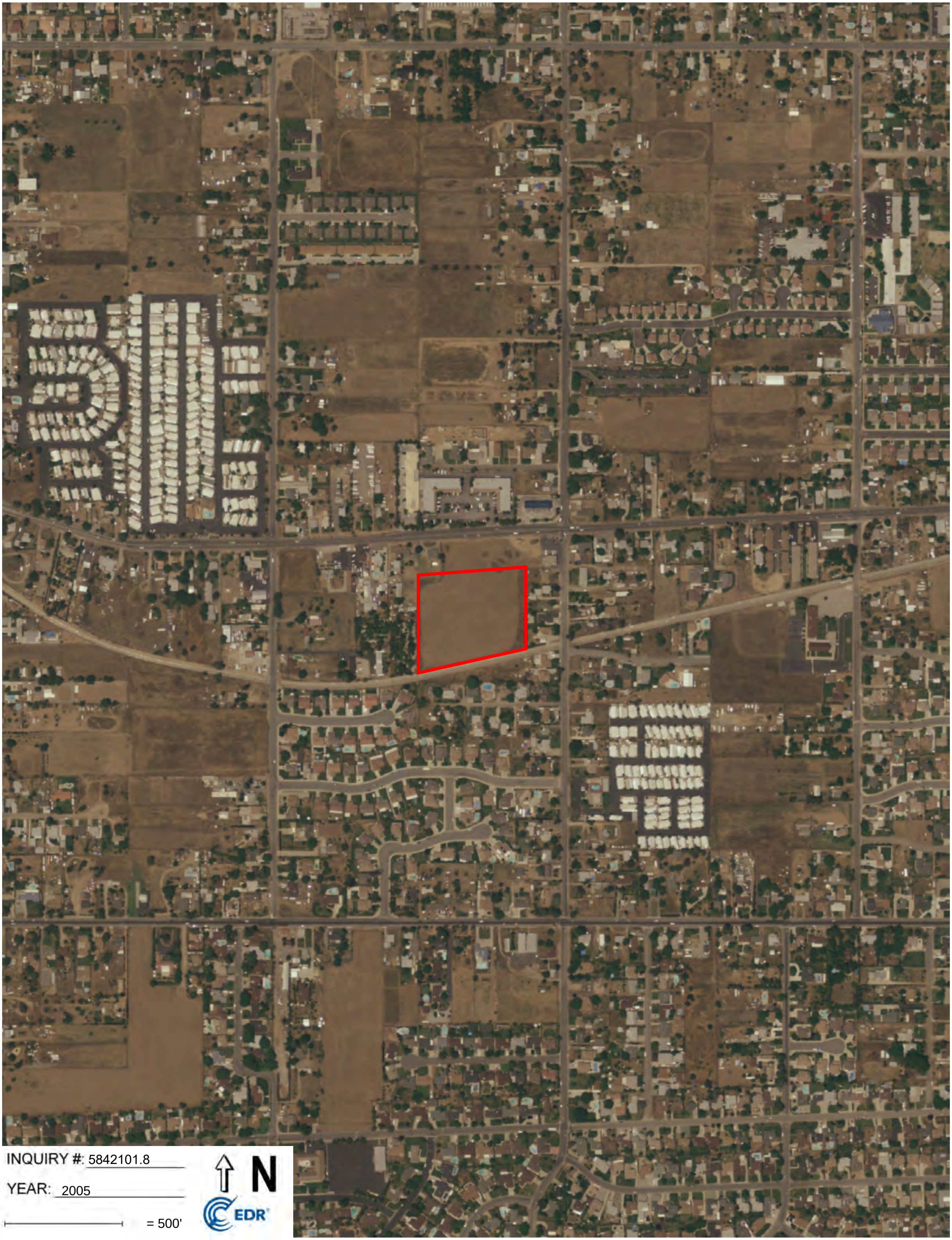


INQUIRY #: 5842101.8

YEAR: 2009

= 500'

N


INQUIRY #: 5842101.8
YEAR: 2005
= 500'
N
EDR

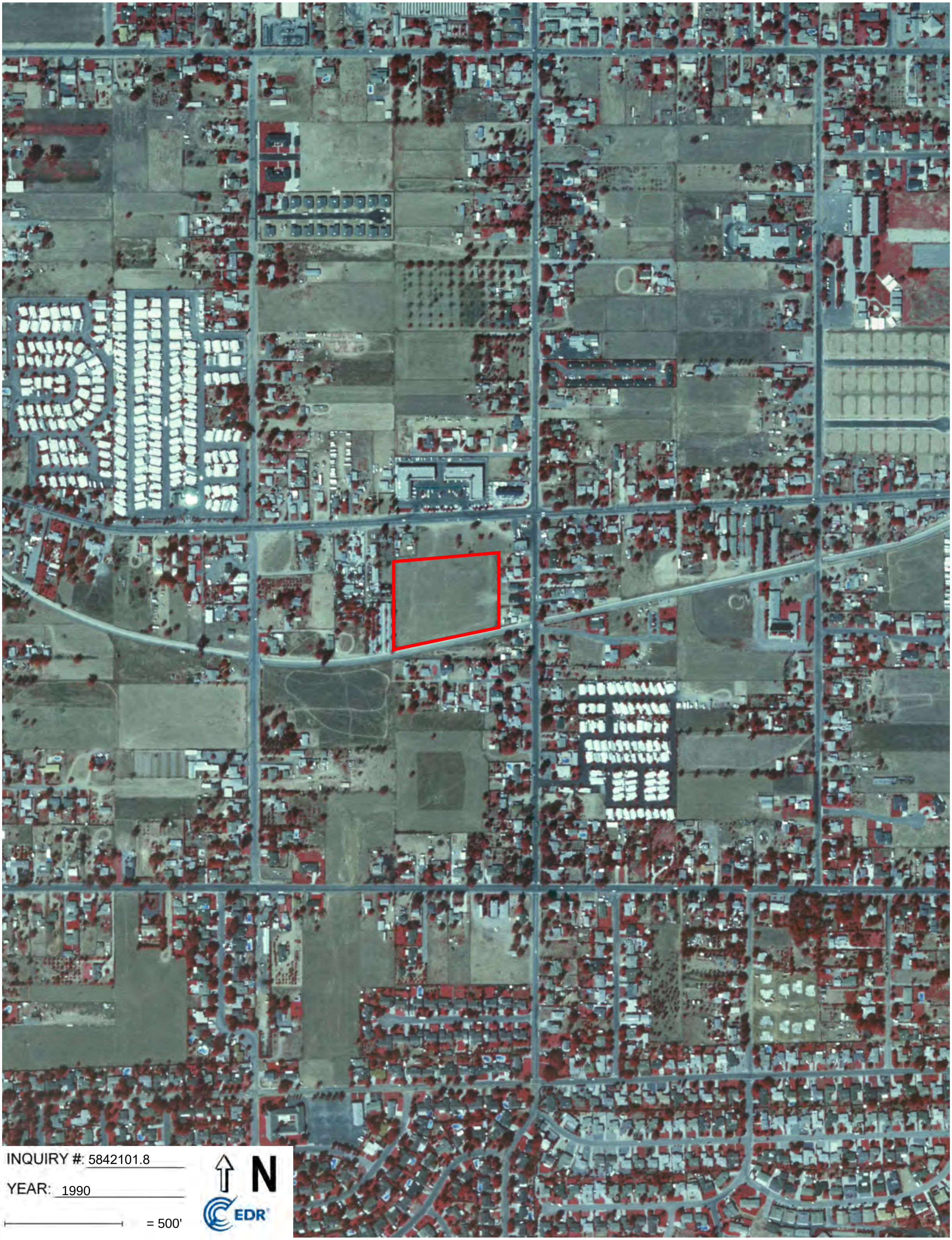
INQUIRY #: 5842101.8

YEAR: 1995

= 500'

N

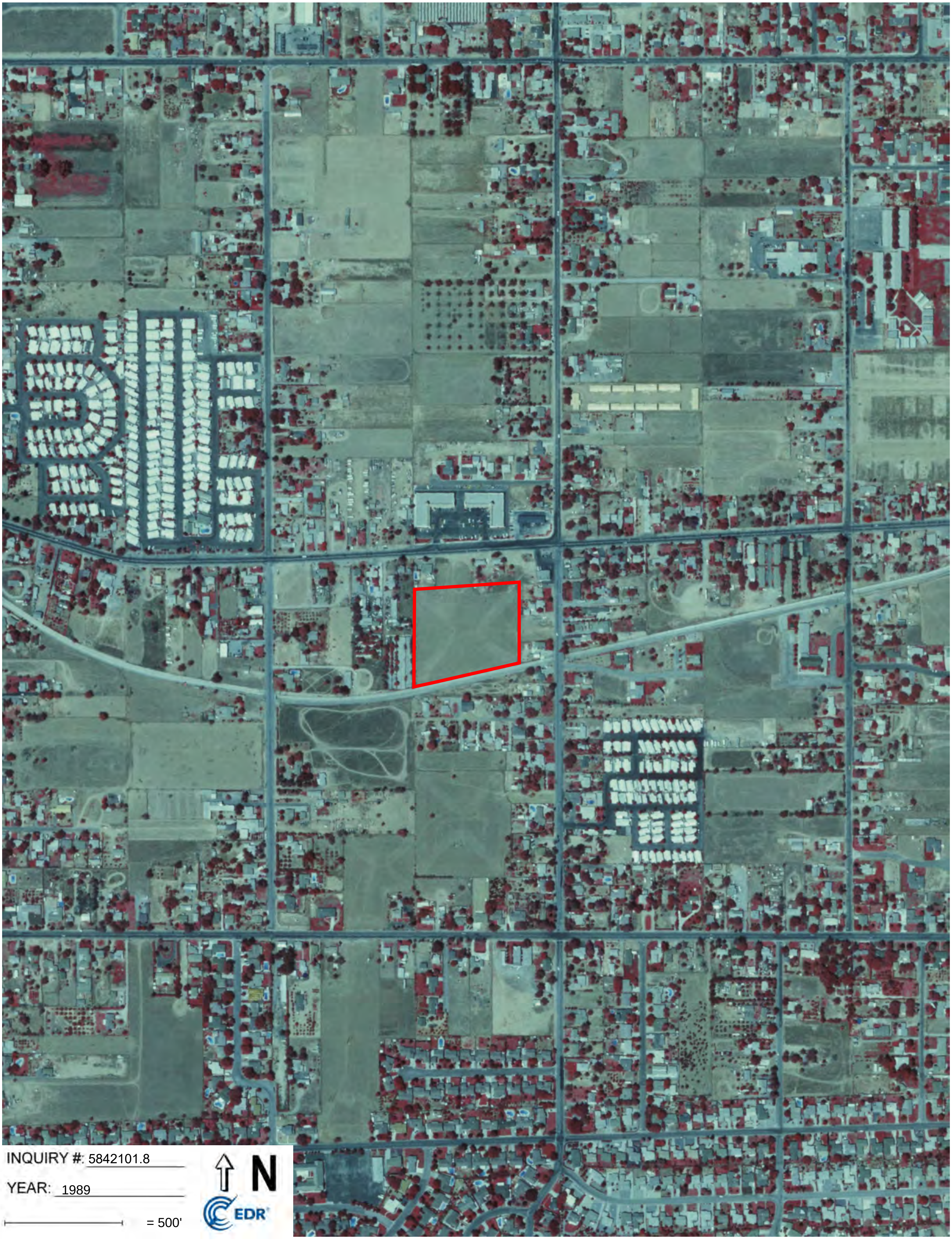
EDR



INQUIRY #: 5842101.8

YEAR: 1990

= 500'



INQUIRY #: 5842101.8

YEAR: 1989

= 500'

N

EDR

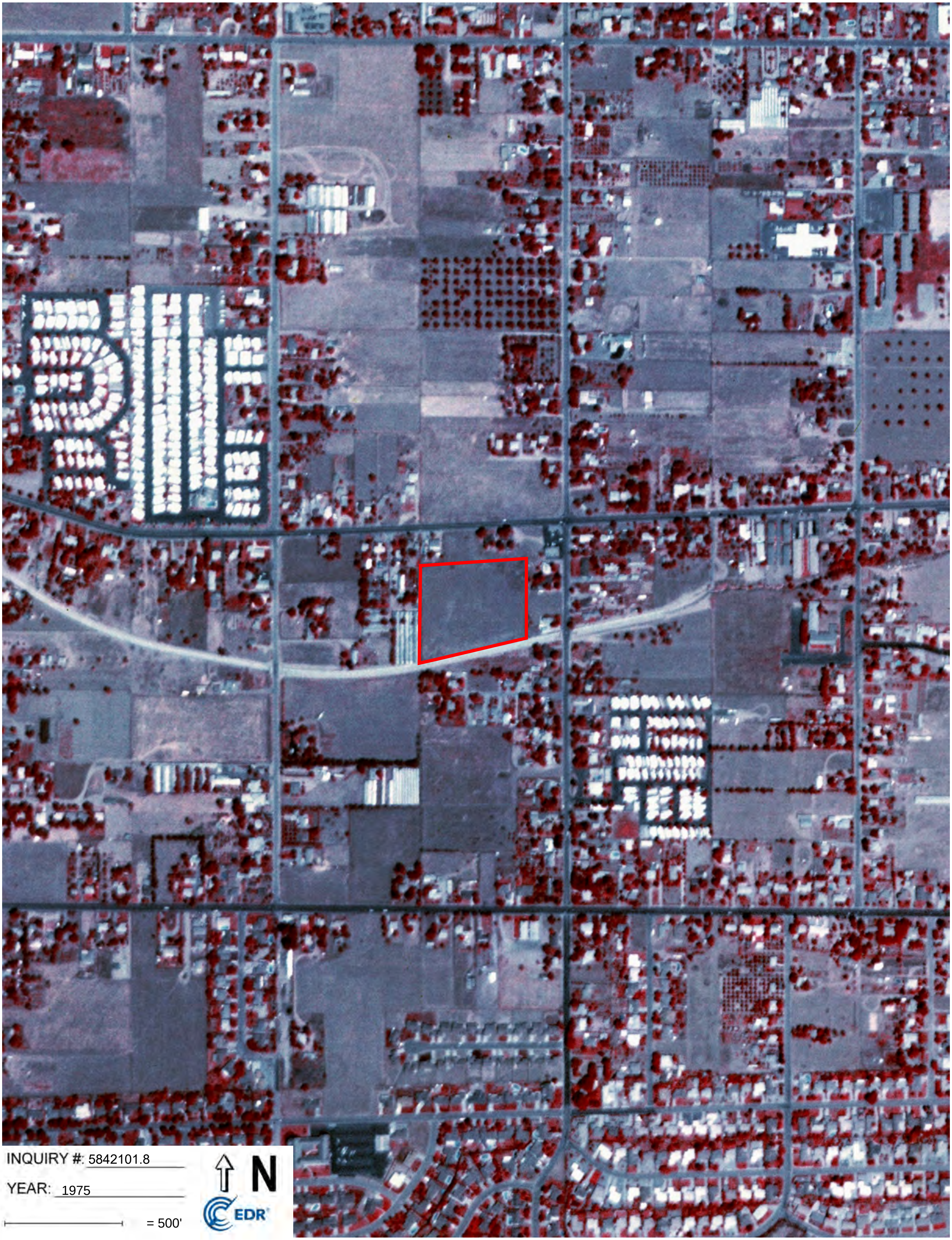
INQUIRY #: 5842101.8

YEAR: 1985

= 500'

N

EDR



INQUIRY #: 5842101.8

YEAR: 1975

= 500'

N

INQUIRY #: 5842101.8
YEAR: 1967
= 500'
N
EDR

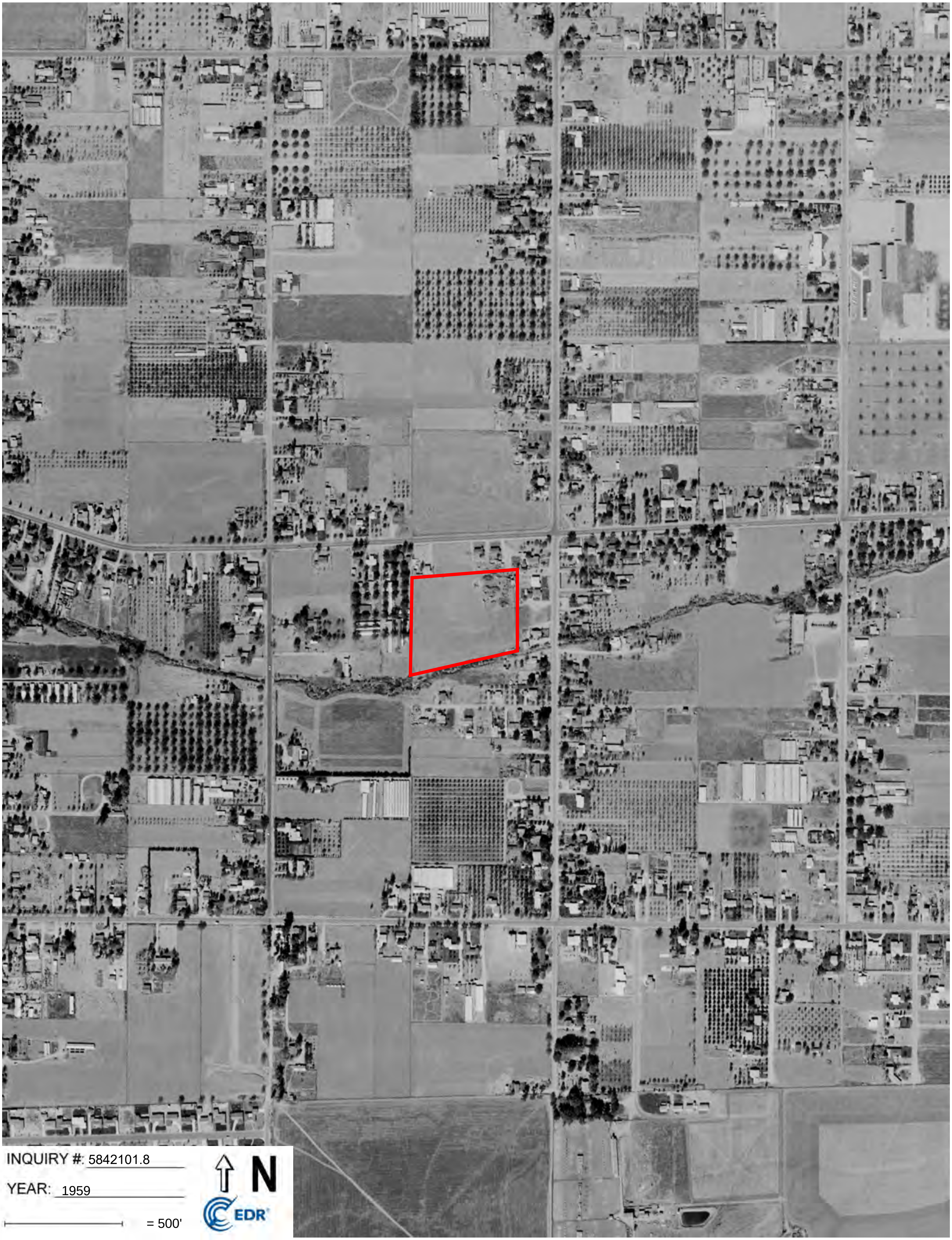
INQUIRY #: 5842101.8

YEAR: 1961

= 500'

N

EDR

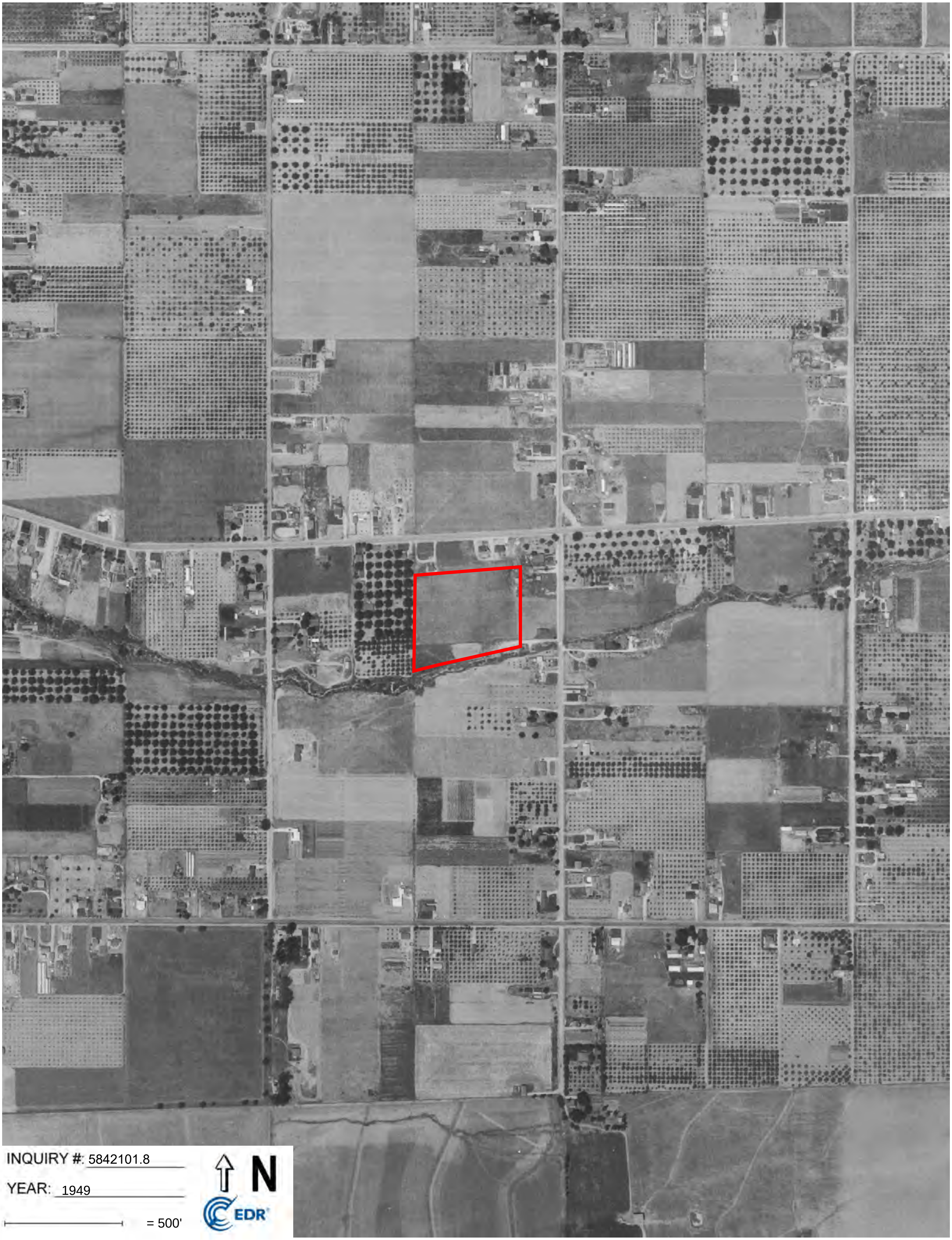

INQUIRY #: 5842101.8
YEAR: 1959
= 500'
N
EDR

INQUIRY #: 5842101.8

YEAR: 1953

= 500'

N


INQUIRY #: 5842101.8
YEAR: 1949
= 500'
N
EDR

INQUIRY #: 5842101.8

YEAR: 1938

= 500'

N

EDR

APPENDIX E

EDR Historical City Directory Information

Calimesa Channel Basin Stage III
West County Line Road & 3rd Street
Calimesa, CA 92320

Inquiry Number: 5842101.5
October 28, 2019

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	***Target Street***	***Cross Street***	***Source***
2014	☑	☐	EDR Digital Archive
2010	☑	☐	EDR Digital Archive
2005	☑	☐	EDR Digital Archive
2000	☑	☐	EDR Digital Archive
	☑	☐	Haines Criss-Cross Directory
1995	☑	☐	Haines Criss-Cross Directory
1990	☑	☐	Haines Criss-Cross Directory
1985	☑	☐	Haines Criss-Cross Directory
1981	☑	☐	Haines Criss-Cross Directory
1975	☑	☐	Haines Criss-Cross Directory
1971	☑	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

West County Line Road & 3rd Street
Calimesa, CA 92320

Year	***CD Image***	***Source***	
3RD ST			
2014	pg A2	EDR Digital Archive	
2010	pg A8	EDR Digital Archive	
2005	pg A14	EDR Digital Archive	
2000	pg A19	Haines Criss-Cross Directory	
1995	pg A23	Haines Criss-Cross Directory	
1990	pg A26	Haines Criss-Cross Directory	
1990	pg A27	Haines Criss-Cross Directory	
1985	pg A29	Haines Criss-Cross Directory	
1981	pg A32	Haines Criss-Cross Directory	
1981	pg A33	Haines Criss-Cross Directory	
1975	-	Haines Criss-Cross Directory	Street not listed in Source
1971	pg A37	Haines Criss-Cross Directory	
W COUNTY LINE RD			
2014	pg A5	EDR Digital Archive	
2010	pg A11	EDR Digital Archive	
2005	pg A17	EDR Digital Archive	
2000	pg A20	Haines Criss-Cross Directory	
2000	pg A21	EDR Digital Archive	
1995	pg A24	Haines Criss-Cross Directory	
1995	pg A25	Haines Criss-Cross Directory	
1990	pg A28	Haines Criss-Cross Directory	
1985	pg A30	Haines Criss-Cross Directory	
1985	pg A31	Haines Criss-Cross Directory	
1981	pg A34	Haines Criss-Cross Directory	
1975	pg A35	Haines Criss-Cross Directory	
1975	pg A36	Haines Criss-Cross Directory	
1971	pg A38	Haines Criss-Cross Directory	

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

3RD ST 2014

917	FORTE, DARLA
920	RUBIO, MIGUEL A
925	CORONA, JUAN A
930	DAVIDSON, NAYOMI
937	CASH, DAVID
938	OCCUPANT UNKNOWN,
	TLZ COMMUNICATIONS LLC
939	FITZGERALD, DEANNA
940	PONKO, VELTON R
941	OCCUPANT UNKNOWN,
947	SILVESTER, SARAH
948	AGUILERA, CARLOS
951	KUMAR, VICKIE
954	HICKEY, THOMAS J
962	BETTY GREEN
	GREEN, BETTY S
963	AGUAYO, JOYCE C
	TITAN ELECTRIC
965	BAEZ, PABLO O
970	WISDOM, DEBORAH S
972	DAVIS, HELEN
973	DIAZ, PAUL
975	SELLERY, ROBERT C
977	PEREZ, DANIEL
980	VAUGHN, GWEN
990	FRIDD, KRYSTEN
	MORALEZ, NAHUM
	NIELSON, TOM V
	NIELSON, VICKI A
1001	ALEXANDER, LEE J
	AUGARE, MARIA L
	AYLWARD, JOHN J
	BALLARD, CHARLES A
	BARNES, ROBERT K
	BLOOD, DAREL
	BONIFACIO, BERNARD C
	BOWEN, JAMES W
	BURTON, JO
	BUSCEMI, RALPH
	CAIN, GARY L
	CRANDALL, LEE A
	DORRIS, MARTIN H
	GONZALES, DIANA S
	GORDON, PETE
	GREENE, FRANK E
	GRIFFIN, PAMELA
	HEADRICK, RICHARD
	HULL, KENNETH
	JORGENSON, FLOYD N
	JUAREZ, GABRIEL

3RD ST 2014 (Cont'd)

1001	KINLEY, ETTA
	KOENIG, LINDA J
	MARTIN, ALBERT
	MCKERLIE, THOMAS H
	MCMICHAEL, FRANK J
	MELTON, JOYCE
	MILLER, LEO F
	MORGAN, PAUL
	NEWMAN, PHYLLIS J
	PHILLIPS, ANNA S
	PONDEROSA MOBILE HOME ESTATES
	QUINN, BETH M
	RAKE, CAROLEE J
	RAREY, NANCY L
	ROACH, FLOYD H
	RODRIGUEZ, MANUEL
	ROGERS, JEFF D
	RUDY, BLANCHE A
	SALTZMAN, PAUL
	SANDERS, CAROL J
	SCOTT, REESE
	SHELLEY, PATRICIA A
	SHERMAN, REGINA R
	SMITH, TERRI L
	STAHL, HERB
	STANTON, FRED
	THEIS, MARTIN B
	TOMASHEK, MARK S
	WOODMAN, CAROL D
	WRIGHT, MILDRED A
1006	KNUDSEN, RICHARD K
1015	BRADFORD, STEVEN L
	BURTON, KATHRYN
	GERDES, DESTER E
	HITCHENS, MATTHEW
	OCCUPANT UNKNOWN,
	ROATH, MATTHEW
	WEATHERBEE, ANGELICA
1016	GATES, PHILLIP
	NAPOLES, CHRISTY
1020	KEEBAUGH KENNY
	KEEBAUGH, KENNY R
1023	HERBERT, CHAD J
1025	VALENCIA, VICTOR M
1027	POWELL, JOYCE
1031	KARNES, DANIEL L
1037	DR TRUCKING TIRE SERVICE
	TOBAR, SANTOS D
1038	MAILHOT PLUMBING
	MAILHOT, LEON L

3RD ST 2014 (Cont'd)

1042	GARDNER, ROD E
1043	LOWELL, ERIC
1053	CLAUSON, JOY B
1075	FOSHEE, RICHARD E
1085	DARROW, SINDY L
1091	KRUEGER, JODY
1097	SORNOSO, KENNETH
1101	BUTLER, JIMMY R
1107	HEFFINGTON, MONTY
1115	EASTMAN FLOOR COVERING
	EASTMAN, JEFF L
1116	BURSTEIN, JOHN M
1145	KELLER, MORLYN
1148	MOONEY, CLAY S
1165	OCCUPANT UNKNOWN,
1166	GRANVILLE PLACE LLC
	HEWITT, PAMELA P
1179	MACIEL, BENJAMIN M
1182	ANDERSON, DAVID J
1189	DICKINSON, BRANDON
1197	FRIES, WALT J
1200	PATTERSON, LINDSAY
1209	KRAUTZ, JAMES F
1210	FLOWERS, TODD A
1215	KING, BRANDON E
1218	BORN, WILLIAM G
1227	MIRELES, RICKY S
1228	ALVARADO, JENNY V
1232	CLAYTON, ATHENA
1233	GOMEZ, EUGENE
1238	MILLER, DAVID P
1241	COOPER, KELLY J
1248	BONORA, JASON
1251	CUTLER, ROBBIN
1258	PAINTER, JOYCE A
1261	JONES, ROBERT H
1267	HERNANDEZ, JESSICA
	PETE DENOTARIS CONTRACTING
1268	CABRAL, HELEN L
1273	TYLER, KENNETH R
1282	BRACK, MAUREEN C
1285	ELLIS, JON D
1290	OCCUPANT UNKNOWN,
1300	CALIMESA COUNTRY CLUB
1301	ARCADI, DAVID R
	GRIMES, LYNETTE
	TRYBA, JOAN

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

W COUNTY LINE RD 2014

119	BERESFORD, DANIEL M
129	RIKKERT, JOHN
163	ARAGON, FRANK E
165	OCCUPANT UNKNOWN,
169	HAGLER, SAMANTHA
179	RIVERA, JUAN
185	MCMULLIN, FRANK
	OCCUPANT UNKNOWN,
193	RAWLS, T
213	ALEMAN, MELINDA
	BURROLA, KATHRINE S
	FINK, KRYSTAL
	FRANK, TIMOTHY R
	HUTSELL, ROB
	MCCLOUD, ANTHONY
217	KNAPP, JUSTIN
	MAPP, JUSTIN
	MARTIN, TIFFINY
	MILLS, DAVINA M
	ROLOOS, NATHAN
221	CRACRAT, JOHN
	SALINAS, E
	SANCHEZ, ELIZABETH
223	OCCUPANT UNKNOWN,
	SADLER, KA
225	CRISAN, CECILIA
	HOWERTON, REBECCA
	SANCHEZ, ASHLEY
227	LEONARD, ROBERT D
	MERRITT, DANIELLE
231	FELLBAUM, LEONARD D
	GUTIERREZ, JOSEPH
	OCCUPANT UNKNOWN,
	SHANE, JESSICA
233	DURO, PALA R
	GARCIA, NOEMI
	PAYSON, DEVON
239	OCAMPO, EDUARDO
245	FEARFACTORPARTYIDEASCOM
	MCCURDY, DONALD L
251	KEMPTON, CORI J
253	LUC, JERRY
255	MACHUCA, ALBERTO O
265	BARNES, JERE R
273	OCCUPANT UNKNOWN,
287	OAK TREE REALTY INC
295	OCCUPANT UNKNOWN,
301	7-ELEVEN INC
	ARMAN CORPORATION
367	CLASSIC RIDES FACTORY

W COUNTY LINE RD 2014 (Cont'd)

367	GARCIA, CLAUDIA A
409	HALEY, DONNA
419	LAW, TERESA L
421	CAMPBELL, PAUL
	GAUTHIER, DREW
423	HAMMOND, CHARLES
427	OCCUPANT UNKNOWN,
431	EPPLER, DERICK W
441	CANNAN, PAMELA I
463	GUYSE, JAY G
471	GUILLEN, ELVER D
479	OCCUPANT UNKNOWN,
543	MARIA SWANSON HORACE MANN
555	HAIR STUDIO 555
577	PYTHON SEWER AND DRAIN
595	HERNANDEZ RODRIGO DENTAL
601	BALLEW-WARD BRENDA LAW OFFICE
611	SILVA, STEPHEN
613	CRITTER CORRAL
665	BAKERS BURGERS NO 153
739	RICHEY, OLIN J
	WILLIAMS, INEZ P
741	BEEMER, TIMOTHY R
746	PHILLIPS, KYLE C
765	KEY, DENVER
774	MADRID, RAUL C
775	ELLIOTT, FRED J
780	GYSBERS, JENNIFER L
	TOSSETTI SON MEM ARRNGMNTS LLC
789	ATWELL, GARY K
801	OLIVER, HELEN I
806	BIO LOGIC ENGINEERING CO
	BRANA, KEN M
809	HOPPER, JOSEPH E
811	GORKE, GALE K
	KIDS KAN INC
	YOUTH KAN
827	SADLER, CHRIS R
830	JAMES, BRIAN N
840	HUNTER ROBERT K TILE
	OCCUPANT UNKNOWN,
	VALLEY DRILLING CO
846	CRUICKSHANK, MARK M
850	OCCUPANT UNKNOWN,
855	OCCUPANT UNKNOWN,
856	HOEFFER, ALAN W
867	YARYAN, DONALD J
870	HOEFER, CRAIG
880	YUCAIPA VALLEY WATER DISTRICT
888	JANA RAINBOWORLD LLC

W COUNTY LINE RD 2014 (Cont'd)

888	LEE, STEPHEN H
901	E & L ELECTRIC
905	CALIMESA SMOG TEST ONLY

3RD ST 2010

917	GONZALEZ, KELLY
	OCCUPANT UNKNOWN,
920	ALVAREZ, KARLO J
925	CORONA, JUAN A
930	DAVIDSON, NAYOMI
937	CASH, DAVID
938	OCCUPANT UNKNOWN,
	TLZ COMMUNICATIONS LLC
939	CONWAY, MELLISA
940	PONKO, VELTON R
941	CAMPANA, DAVID A
947	SEXTON, CHRIS D
948	AGUILERA, JOSE C
951	SAINS, TANYA L
954	OCCUPANT UNKNOWN,
962	BETTY GREEN
	GREEN, BETTY S
963	CAMPBELL, BLAKE G
	TITAN ELECTRIC
965	SCHOLZ, WILLIAM W
970	WISDOM, DEBORAH S
972	DAVIS, HELEN
973	IVY, MICHAEL N
975	LEMON, SUSIE
977	MARIN, MELIDA
980	GRIEFNOW, LAURREN W
990	GLASBY, KATHY
	HILL, TRACEY
	MORALEZ, NAHUM
	NIELSON, TOM V
	RUIZ, NAHUM
	SELLERS, LEAH
1001	ANGELO, JACKIE
	BARNES, ROBERT K
	BONIFACIO, BERNARD C
	CARROLL, MICHAEL
	CHANEY, CHARLENE A
	COX, ALMA L
	DORRIS, MARTIN H
	EDELMAN, CLIFFORD
	FOSTER, FRANCIS N
	GANN, JOANNA U
	GONZALES, FERNANDO
	GYFORD, MARGARET V
	INLAND EMPIRE CEDAR HOME LVNG
	JORGENSON, FLOYD N
	KOENIG, LINDA J
	LENE, MARY L
	LERNER, ANDREW J
	LETOURNEAU, RENEE A

3RD ST 2010 (Cont'd)

1001	MCKERLIE, THOMAS H
	MCMICHAEL, FRANK J
	MELTON, RILDA L
	MILLER, ETTA
	NITZSKY, BETTY J
	POE, MARGARET
	PONDEROSA MOBILE HOME ESTATES
	RAREY, NANCY L
	REAY, WILLARD G
	RICH, ALEXANDER F
	RODRIGUEZ, MANUEL
	RUDY, JAMES E
	SOCHA, CHESTER J
	STAHL, HERB
	STANTON, FRED
	TOMASHEK, MARK S
	WELCH, RICHARD D
	WILLIAMS, BUD
	WOODMAN, CAROL D
	WRIGHT, MILDRED A
1006	KNUDSEN, RICHARD K
1015	ALANIZ, ADELINE M
	BRADFORD, STEVEN
	BROWN, SARAH
	CORWIN, STACIE
	OCCUPANT UNKNOWN,
1016	DORAME, SAM
	FISCHLE, LINDA
	GOLDFUSS, KATHLEEN J
1020	KEEBAUGH KENNY
	KEEBAUGH, PAULA G
1025	VALENCIA, VICTOR M
1027	BROWNING, SARAH
1031	KARNES, DANIEL L
1037	MICHAELSON, MICHAEL L
1038	MAILHOT PLUMBING
	MAILHOT, LEON L
1042	GARDNER, ROD E
1053	CLAUSON, JOY B
1085	DARROW, SINDY L
1091	GIPSON, MARK L
1097	SORNOSO, KENNETH
1101	JW WELDING SERVICES INC
	WHITNEY, LYNN M
1107	HEFFINGTON, JERRY H
1115	EASTMAN, JEFF L
1116	BURSTEIN, JOHN M
1145	KELLER, MORLYN
1148	MOONEY, CLAY S
1165	RICHEY, RANDY A

3RD ST 2010 (Cont'd)

1166	GRANVILLE PLACE LLC
	HEWITT, PAMELA P
1179	MACIEL, BENJAMIN M
1182	ANDERSON, DAVID J
1189	HUCKINS, BRIAN H
1192	OCCUPANT UNKNOWN,
1197	FRIES, WALT J
1200	LOPEZ, SHARON P
1209	SALSTROM, ALYSSA
1210	FLOWERS, TODD A
1215	KING, BRANDON E
1218	BORN, REBECCA S
1227	MIRELES, RICKY S
1228	ALVARADO, JENNY V
1241	COOPER, KELLY J
1248	BONORA, JASON
1251	CUTLER, BOBBIE L
1261	OCCUPANT UNKNOWN,
1267	IPSER, EDWARD A
	PETE DENOTARIS CONTRACTING
1268	CABRAL, HELEN L
1273	TYLER, KENNETH R
1282	OCCUPANT UNKNOWN,
1285	ADVANTAGE MOBILE NOTARY
	LOPEZ, MARC A
1290	OCCUPANT UNKNOWN,
1300	CALIMESA COUNTRY CLUB
1301	RYBAK, SHARON
	VERA, JUAN

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

W COUNTY LINE RD 2010

129	RIKKERT, JOHN
163	ARAGON, PETE J
169	OCCUPANT UNKNOWN,
179	CARO, NYDIA
185	OCCUPANT UNKNOWN,
193	SWEET, JIMMY D
213	FINK, LAROCCO M
	FORT, PAT
	FRANK, TIMOTHY R
	HUTSELL, ROB
217	KNAPP, CANDANCE
	ROLOOS, NATHAN
221	CRACRAT, JOHN
223	BELASCO, RODOLFO
	LOVETT, BARBARA J
	OCCUPANT UNKNOWN,
225	MARTINEZ, JOSE I
	RODRIGUEZ, JANELLE
	RUBEN, DEVON
227	KELLER, MICHAEL
	LEONARD, ROBERT D
	TORRES, MANUEL
231	LEONARD, ROBERT
	OCCUPANT UNKNOWN,
233	GARCIA, NOEMI
	OCCUPANT UNKNOWN,
	POHL, CARISSA
239	OCAMPO, EDUARDO
243	STERLING, JANICE A
245	MCCURDY, JEFF C
251	THOMAS, CORI J
253	LUC, JERRY
255	MACHUCA, ALBERTO O
265	BARNES, JERE R
273	ANDERSON, MARK K
279	BREWSTER ELECTRIC INC
	BREWSTER, ROBERT E
287	HURLEY, KELLY J
	OAK TREE REALTY INC
295	FORBES, GORDON J
301	7-ELEVEN INC
367	ACT I RESTORATIONS INC
	FLORES, EDUARDO L
	MURPHREE, LISA
371	MORALES, JAIME L
	PARTNERSHIP CONSISTING JAIM
381	MORGANS CREEK NURSERY INC
	SMITH, LEESA
409	GREGORY, S
415	REYES, MARCELINO

W COUNTY LINE RD 2010 (Cont'd)

421	ALVAREZ, V
	BARTLETT, ERICA
	HILTABIDEL, VANECA
	MCCURDY, DONALD L
423	DONOVAN, HELEN M
427	ROSSETTI, MICHEL
431	EPPLER, VIRGINIA M
441	OCCUPANT UNKNOWN,
463	GUYSE, JAY G
471	GUILLEN, ELVER D
543	HORACE NANN MARIA SWANSON
555	HAIR STUDIO 555
575	PET BATH & BEYOND
	PINE TREE CHIROPRACTIC
577	PYTHON SEWER AND DRAIN
595	HERNANDEZ RODRIGO DENTAL
601	BALLEW-WARD BRENDA LAW OFFICE
611	OCCUPANT UNKNOWN,
613	CRITTER CORRAL
625	TROYCES AUTOMOTIVE MACHINE SP
665	BAKERS BURGERS NO 153
739	RICHEY, OLIN J
	WILLIAMS, JACK R
741	GUZMAN, JONELL G
746	MONTENEGRO, VALERIE
765	BENNETT DRYWALL
	KEY, DENVER
774	AANERUD, ROBERT S
775	ELLIOTT, FRED J
776	CAMPBELL, JOHN C
780	CLOUGH, SARALYN L
	TOSSETTI SON MEM ARRNGMNTS LLC
789	ATWELL, GARY K
801	OLIVER, HELEN I
806	BIO LOGIC ENGINEERING CO
	BRANA, KEN M
809	HOPPER, JOSEPH E
811	GORKE, GALE K
	KIDS KAN INC
	YOUTH KAN
814	STRACHEN, STEPHEN R
827	SADLER, RICHARD L
830	JAMES, BRIAN N
840	HUNTER, ROBERT K
846	CRUICKSHANK, RAYMOND L
850	OCCUPANT UNKNOWN,
855	GOSS, SCOTT A
856	HOEFER, ALAN W
867	YARYAN, ALICE L
870	HOEFER, CLARENCE W

W COUNTY LINE RD 2010 (Cont'd)

878	FEENSTRA, TRAVIS
880	YUCAIPA VALLEY WATER DISTRICT
888	JANA RAINBOWORLD LLC
	LEE, HYON S
901	E & L ELECTRIC
905	CALIMESA SMOG TEST ONLY

3RD ST 2005

917	OCCUPANT UNKNOWN,
	TAYLOR, OTIS E
918	CAMPBELL, GLEN A
920	RUBIO, MIGUEL A
925	SEARLES, MARILYN J
930	OCCUPANT UNKNOWN,
938	OCCUPANT UNKNOWN,
939	OCCUPANT UNKNOWN,
940	PONKO, VELTON R
941	OZKILME, DAMLA
947	SEXTON, CHRIS D
948	AGUILERA, JOSE C
951	KROOT, CHERYL W
954	HICKEY, MARY B
962	GREEN, BETTY S
963	BRANNAN, ELSA
965	SCHOLZ, WILLIAM W
970	WISDOM, DEBORAH S
972	DAVIS, ESTHER L
973	IVY, MICHAEL N
975	SELLERY, SUSAN C
977	LUCERO, RUDY J
980	GRIEFNOW, LAURREN W
990	DEEVER, TANNER S
	GUTIERREZ, ROBERT
	NIELSON, TOM K
	SELLERS, LEAH
	WHILLOCK, KELLY
1001	BROWN, FAYE M
	CAIN, RAY C
	CHANEY, CHARLENE A
	COX, ALMA L
	DIA, ANGELA H
	DORSTEN, DAVID E
	EATON, MARY J
	EDELMAN, CLIFFORD
	ENDAL, JOE E
	FISHER, HAROLD G
	GAEDE, EUGENE N
	GANN, JOANNA U
	GYFORD, MARGARET V
	JAMES, KAREN
	JOHNSON, GARY T
	KIPKE, ELAINE M
	LETOURNEAU, RENEE A
	MCMICHAEL, FRANK J
	MELTON, RILDA L
	MILLER, MYRON
	PAYSON, PHOEBE M
	PONDEROSA MOBILE HOME ESTATES

3RD ST 2005 (Cont'd)

1001	REAY, WILLARD G
	RICH, ALEXANDER
	ROGERS, JEFFREY D
	SHEARHART, IRA D
	SHELLEY, PATRICIA A
	STAHL, HERB
	STANTON, HOWARD J
	STEINER, ESTHER
	STOREY, DALE K
	TOON, MARY J
	WALCZAK, AGNES E
	WELCH, MARY E
	WRIGHT, MILDRED A
1006	KNUDSEN, RICHARD K
1015	LEWALLEN, PATRICIA
	LOUGHLIN, LAWRENCE
	VALDIVIA, SERENA
1016	FISCHLE, WILLIAM
	SAND, MICHELLE
	TREVINO, ALBERT J
1020	KEEBAUGH, PAULA G
1023	OCCUPANT UNKNOWN,
1025	VALENCIA, VICTOR M
1027	OCCUPANT UNKNOWN,
1031	KARNES, DANIEL L
1037	ROMAN, YVONNE
1038	KAPPEL, CRYSTAL
	LEON R MAILHOT
1042	DESERT POOL PLASTERING INC
	GARDNER, ROD E
1053	CLAUSON, JOY B
1075	OCCUPANT UNKNOWN,
1085	MACCARONE, MATT L
1091	GIPSON, MARK L
1097	SORNOSO, KENNETH
1101	PERRY, GLEN A
1115	EASTMAN, JEFF L
1116	BURSTEIN, RONALD G
	RONS GRAPHIC DESIGN
1148	MOONEY, CLAY S
1156	KAHN, SAM J
1165	RICHEY, RANDY A
1166	MAGRINI, ELENORA
1182	ANDERSON, DAVID J
1189	HUCKINS, BRIAN H
1192	OGLE, TOM D
1197	FRIES, WALT J
1200	LOPEZ, SHARON P
1209	SMITH, JULIE C
1210	FLOWERS, TODD A

3RD ST 2005 (Cont'd)

1215	KING, TRENT E
1218	BORN, WILLIAM G
1227	MIRELES, RICKY S
1228	ALVARADO, ALBERTO V
1233	GOMEZ, EUGENE
1238	MILLER, STEVE E
1241	COOPER, KELLY J
1248	LAGARAS, BRIAN M
1251	OCCUPANT UNKNOWN,
1258	PAINTER, WALTER C
1261	JONES, ROBERT H
1267	OCCUPANT UNKNOWN,
1268	CABRAL, HELEN
1282	OCCUPANT UNKNOWN,
1285	ELLIS, JON D
1290	MC NULTY DEVELOPMENTS
	MCNULTY, JAMES F
1300	CALIMESA COUNTRY CLUB
1301	CHILDRESS, MARK C
	CONRAD, RALPH
	JANUARY, DARIUS
	JENKINS, TIFFANY
	JONES, ASHLEY
	LACRUZ, ANTHONY D
	MARTINEZ, TEDDIE
	MUNIZ, ROSA
	STEPHENS, RYAN C
	STONE, L
	WILLIAM, LINK

W COUNTY LINE RD 2005

129	LOFTIS, BILLY R
163	AANERUD, ROBERT S
	R T S CUSTOM TILE
165	OTIS, JOHN R
169	OCCUPANT UNKNOWN,
175	OCCUPANT UNKNOWN,
185	HERNANDEZ, UBEN H
193	SWEET, NONA B
213	FORT, LORA M
	FRANK, TIMOTHY R
	HOUSEWRIGHT, DENNIS
	RICHARD, KATHLEEN A
	SHEETZ, JOHNEEN C
217	BAUTISTA, MIGUEL
	FOLTZ, KIMBERLY S
	HADERER, KIM
	PEARSON, VANESSA
	RUIZ, VERONICA
	WILSON, TERRI C
223	OCCUPANT UNKNOWN,
	TRUXELL, WILLIAM L
225	IKELER, KIMBERLY A
	RAMIREZ, JOSE
227	LEONARD, ROBERT D
231	OCCUPANT UNKNOWN,
233	GARCIA, NOEMI
239	OCAMPO, JUAN S
243	STERLING, WILLIAM G
253	MARTINEZ, ALEXANDER
255	MACHUCA, ALBERTO O
265	MEISSEN, ROBERT L
279	CURTIS, ELSIE K
287	HURLEY, KELLY J
295	FORBES, GORDON J
301	7-ELEVEN INC
345	YBARRA, JOHN T
371	MORALES, WALTER
381	MORGANS CREEK NURSERY INC
	OCCUPANT UNKNOWN,
409	CLEGG, JENNIFER F
419	LARSON, JACK D
421	ALVAREZ, V
423	DONOVAN, HELEN
427	ROSSETTI, MICHEL
431	EPPLER, VIRGINIA M
471	GUILLEN, GUMARO C
569	FITCH, MILDRED L
579	ON THE VERANDA
595	HERNANDEZ RODRIGO DENTAL
601	BALLEW-WARD BRENDA LAW OFFICE

W COUNTY LINE RD 2005 (Cont'd)

601	CHARLES D LOO MD INC
611	JONES, PAUL E
613	CRITTER CORRAL
625	TROYCES AUTOMOTIVE MACHINE SP
665	BAKERS BURGERS NO 153
739	MORRIS, RONALD E
746	WROBEL, JOHN L
765	BENNETT DRYWALL
773	OCCUPANT UNKNOWN,
774	AANERUD, ROBERT S
	RTS TILE
775	ELLIOTT, FRED J
776	OCCUPANT UNKNOWN,
780	CLOUGH, SARALYN L
789	ATWELL, GARY K
801	OLIVER, HELEN I
806	BIO LOGIC ENGINEERING CO
	BRANA, KEN M
809	HOPPER, JOSEPH E
811	KIDS KAN INC
	MITCHELL, BONNIE J
814	PETERSON MICHELLE ABSOLUTE
	PETERSON, BRADLEY
827	SADLER, RICHARD L
830	JAMES, BRIAN N
840	PATRICK, TIMOTHY M
846	CRUICKSHANK, RAYMOND L
850	REAGAN, CHARLES A
855	RODRIQUEZ, LYNN L
856	HOEFER, SYLVIA E
867	YARYAN, ALICE L
870	HOEFER, CLARENCE W
880	YUCAIPA VALLEY WATER DISTRICT
888	JANA RAINBOWORLD LLC
	LEE, HYON S
	YU CAL DEV INC A CAL COR
901	E & L ELECTRIC
905	CALIMESA SMOG TEST ONLY

Target Street	Cross Street	Source
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3RD ST 2000

3RD 92320 CALIMESA

WEALTH CODE 2.6

X COUNTY LINE RD

917	●HUBERT Harold	OO	+0
918	●CAMPBELL Glen	OO	8
920	●JIMENEZ Teresa	OO	9
925	●CORONA Terri L	909-795-3113	
	SEARLES M	909-795-4007	6
930	●MATTESON Shirley	OO	+0
937	●VANSTRATEN Mary	OO	+0
938	●MERRIMAN Tod	OO	+0
940	●DRUMMOND Laura	OO	9
941	XXXX	OO	
947	●SEXTON Chris	909-795-8906	+0
948	●AGUILERA Jose	OO	8
951	●LOYA James	OO	+0
954	●HICKEY Mary	909-795-1412	7
962	●GREEN B S	909-795-6684	
963	●PEARSON Gary	909-795-7684	2
965	●SCHOLZ William W	909-795-4900	
970	●WISDOM Deborah	OO	+0
972	●DAVIS Esther	OO	+0
973	●RUPE Vera F	909-795-7926	
975	●SELLERY Robert	OO	+0
977	●LUCERO Jos C	909-795-2272	
980	●GRIEFNOW Laumen	OO	+0
990	●CHRISTENSEN Owen	OO	+0

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 2000

213	MULLENAX J	909-795-9833	+0
217	XXXX	OO	
221	●HICKS Glen	OO	+0
223	XXXX	OO	
225	XXXX	OO	
227	MENDOZA Fernando	909-795-8851	9
	●MORGAN William	OO	+0
231	●HICKS Glen	OO	+0
233	GARDINER Irene	909-795-8428	9
239	●O Campo Juan	909-795-8127	+0
245	●HARRELSON E	OO	+0
255	●MACHUCA Alberto	OO	9
273	●VISE Aaron	OO	8
279	●CURTIS Elsie K	909-795-5273	
287	●GRANLUND Brett	OO	+0
	★ **WESTERN GROUP THE**	**909-795-9722**	**+0**
295	●FORBES Gordon	909-795-3010	
301	●GELGUR Raymond	OO	+0
	★ **7 ELEVEN FOOD STORES 13980**	**909-795-6735**	**9**
327	XXXX	OO	
345	●SANCHEZ Ernie	OO	+0
	WONG Loretta	909-795-2357	+0
355	●CARROLL Helene	OO	+0
361	AMBACH Geo	909-795-5176	
367	●MCDANIEL Richard	OO	+0
	★ **MCDANIELS GARAGE**	**909-795-6590**	
371	XXXX	OO	
409	XXXX	OO	
415	●NEFF Glenn	OO	+0
419	●MCCASLAND William	OO	+0
	WATKINS Kimberly	909-795-0626	7
421	MCINTIRE Chester Jr	909-795-3070	9
427	●PILARCIK David	OO	+0
431	●EPPLER J W	909-795-1900	
441	●GARDNER Mark	OO	+0
452	●CASH Robert	OO	8
459	●ABREVAYA Morris	OO	+0
463	●GUYSE Jay	OO	+0
471	●GUILLEN Gumaro	OO	+0
479	●LARSEN Glen	OO	+0

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

W COUNTY LINE RD 2000

119	BERESFORD, DANIEL
120	OCCUPANT UNKNOWN,
129	LOFTIS, BILLY R
163	AANERUD, ROBERT
165	OCCUPANT UNKNOWN,
169	OCCUPANT UNKNOWN,
185	MERINO, ARMANDO
193	SWEET, NONA B
213	MULLENAX, J
217	GREENLEE, AMANDA
223	OCCUPANT UNKNOWN,
227	MENDOZA, F
233	GARCIA, NOEMI
239	OCAMPO, JUAN
255	OCCUPANT UNKNOWN,
273	VISE, AARON V
279	CURTIS, ELSIE K
287	OCCUPANT UNKNOWN,
295	FORBES, GORDON
297	SOLBERG, EDMUND W
303	OCCUPANT UNKNOWN,
305	THEIS, ALICE F
325	OCCUPANT UNKNOWN,
345	SMITH, RYANN
355	OCCUPANT UNKNOWN,
361	AMBACH, HELENE
367	MCDAIELS
409	KAY, SAMUEL S
415	OCCUPANT UNKNOWN,
419	WATKINS, KIMBERL
421	BAKER, PAMELA
	BAUER, GARY L
	KUNZE, LEON L
423	CALKIN, LENA M
427	PILARCIK, DAVE P
431	EPPLER, J W
441	COOK, JACK D
452	CASH, ROBERT L
459	OCCUPANT UNKNOWN,
463	OCCUPANT UNKNOWN,
471	OCCUPANT UNKNOWN,
479	OCCUPANT UNKNOWN,
543	COTTAGE CLASSICS
544	OCCUPANT UNKNOWN,
555	OCCUPANT UNKNOWN,
569	FITCH, MILDRED
575	ANTIQUE TIME
577	PYTHON SEWER AND DRAIN
579	PERIWINKLE WOODS
595	HERNANDEZ RODRIGO DENTAL

W COUNTY LINE RD 2000 (Cont'd)

601	OCCUPANT UNKNOWN,
611	JONES, PAUL E
	TRI COUNTY APPRAISERS
625	TROYCES AUTOMOTIVE MACHINE SP
730	FOREMAN, BARBARA J
739	MORRIS, RONALD E
741	VANPIENBROEK, BRUCE
746	OCCUPANT UNKNOWN,
765	BENNETT DRYWALL
	BENNETT, JAIME
773	ELLIOTT, MARK A
774	AREND, CARL W
775	ELLIOTT, FRED J
776	OCCUPANT UNKNOWN,
780	DICK, ZANE E
789	ATWELL, GARY
801	OLIVER, H I
806	CAMPBELL, FRANK
809	HOPPER, JOSEPH E
811	GORKE, GALE
814	BRIDGES, ROY
	RDB ENTERPRISES CO
827	SADLER, R
830	JAMES, BRIAN
846	CRUICKSHANK, RAY
850	OCCUPANT UNKNOWN,
855	RODRIQUEZ, LYNN
867	OCCUPANT UNKNOWN,
870	OCCUPANT UNKNOWN,
888	CRISWELL, LE ROY
901	E & L ELECTRIC

Target Street	Cross Street	Source
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3RD ST 1995

3RD 92320 CALIMESA

WEALTH CODE 2.6

917	• HUBERT Harold	00	+5	
920	• JIMENEZ Rafael	00	+5	
925	CORONA Terri L	795-3113		
	GONZALEZ Gustavo C	795-8638	+5	
	• SEARLES Gordon	00	+5	
930	XXXX	00		
938	• MERRIMAN Tod	00	+5	1
940	• DALEN Priscilla	00	+5	
941	• LEEVER Wm H	795-3845	4	1
947	• SELLS Genevieve	00	+5	1
951	XXXX	00		1
954	• DILLBERG Kenneth	00	+5	1
962	• GREEN B S	795-6684		
963	• PEARSON Gary	795-7684	2	1
965	• SCHOLZ Wm W	795-4900		1
970	XXXX	00		1
972	• BOND M Luther	795-4081		1
973	• RUPE Vera F	795-7926		1
975	• SELLERY Robert	00	+5	
977	• LUCERO Jos C	795-2272		1
980	• GRIEFNOW Laurren W	00	+5	
990½	OSHIA Marty	795-4331	2	1

Target Street	Cross Street	Source
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W COUNTY LINE RD 1995

3

COUNTY LINE RD W
92320 CALIMESA

WEALTH CODE 3.0

119	BERESFORD Danl	795-1475	7
129	LOFTIS Billy R	795-5139	4
163	• SCOTT Robert	00	+5
175	XXXX	00	
185	VISCARRA Juan A	795-8269	+5
193	• SWEET Nona Belle	795-2381	
	• SWEET Walter	795-2381	
213	XXXX	00	
217	FOWLER M E	795-7426	+5
	NIELSON Dell W	795-7707	4
223	XXXX	00	
225	XXXX	00	
227	XXXX	00	
231	XXXX	00	
239	• OCAMPO Juan	795-8127	2
255	• CLUFF Jack	00	+5
	• MEYER Scott	00	+5
279	CURTIS Elsie K	795-5273	
287	XXXX	00	
295	• FORBES Forrest	00	+5
	FORBES Gordon	795-3010	
301	* **SEVEN 11 FOOD 13980**	**795-6735**	6
327	XXXX	00	
361	AMBACH Geo	795-5176	
367	MCDANIELS Garage	795-6590	
371	BLACKERBY Johnny	795-0768	3
409	GROSS Tim	795-3820	3

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1995

..COUNTY LINE RD W 92320 CONT..

415	XXXX	00	
427	PILARCIK Dave	795-3312	4
431	● EPPLER J W	795-1900	
441	XXXX	00	
471	HICKEY Mary	795-1412	4
479	LARSEN Glen M	795-5584	
543	XXXX	00	
555	★COUNTY LINE SALOON	795-8607	
557	XXXX	00	
569	FITCH Mildred L	795-1539	
575	★BLUE RIBBON REALTY	795-7250	
	★JEFFREYS JIM REALTY	795-7250	
577	COX Larry	795-7997	1
	★PYTHON SEWER&DRAIN	795-1753	1
579	ERARD Terry	795-1630	1
	ERARD Terry	795-1363	1
595	XXXX	00	
601	XXXX	00	

Target Street	Cross Street	Source
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3RD ST 1990

3RD 92320 CALIMESA

925	CORONA Ecliceric	795-9433	9
	CORONA Terri L	795-3113	5
941	TOY T J	795-4717	5
947	XXXX	00	
951	XXXX	00	
954	XXXX	00	
962	GREEN B S	795-6684	5
965	SCHOLZ Wm W	795-4900	5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

3RD ST 1990

..3RD		92320 CONT..	
970	XXXX	00	
972	BOND M Luther	795-4081	5
973	RUPE Vera F	795-7926	5
975	XXXX	00	
977	LUCERO Jos C	795-2272	5
980	ROUSE Donald W	795-2649	5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1990

COUNTY LINE RD W
92320 CALIMESA

119	BERESFORD Danl	795-1475	7
129	BLAIR Celeste	795-4973	+0
163	XXXX	00	
175	XXXX	00	
185	FREE Richard	795-8455	8
193	SWEET Nona Belle	795-2381	
	SWEET Walter	795-2381	
213.........	APARTMENTS		
	CHRISTENSEN Diana	795-1438	7
	JENSON Jos M	795-4981	+0
	PICKENS Ernest R	795-4174	+0
	PICKENS Manie	795-4174	+0
	SANDERS N A	795-7998	+0
	THOMPSON S O	795-8704	+0
213..........			
217	BICE Jim W	795-1024	
	BICE John D	795-1024	
	BOLING Julia	795-1830	5
	VANSANDT Geo	795-7266	5
221	BRACKETT F	795-9104	8
223	HAMILTON John	795-7112	+0
225	XXXX	00	
227	WELLS Violet	795-2082	8
231	CURRIE Barbara E	795-5526	
	CURRIE Dan	795-5526	
	WEBER Lauren K	795-2880	8
239	XXXX	00	
245	MARTIN Mary	795-2862	5
279	CURTIS Elsie K	795-5273	5
287	XXXX	00	
295	★CALIMESA PRINTING	795-3010	5
	FORBES Forrest D	795-3010	5
301	★SEVEN 11 FOOD 13980	795-6735	6
327	XXXX	00	
361	AMBACH Geo	795-5176	5
367	MCDANIELS Garage	795-6590	5
371	XXXX	00	
409	KLORH Patrick	795-3820	+0
415	LONDENBERG Patricia	795-9289	+0
431	EPPLER J W	795-1900	5
459	★EL RANCHO CALIMESA	795-5151	5
479	LARSEN Glen M	795-5584	5
543	★POWERS CONSTRUCTION	795-2575	7
555	★COUNTY LINE SALOON	795-8607	5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

3RD ST 1985

3RD 92320 CALIMESA

917½	GRUMPYS WHEELCHR VN	795-1331	+5
925	CORONA TERRI L	795-3113	+5
941	TOY T J	795-4717	+5
947	WHITES ECONOCLN CPT	795-8333	+5
948	BREWER PHILLIP	795-7178	+5
962	GREEN B S	795-6684	+5
965	SCHOLZ WM W	795-4900	+5
970	SHOOP CHAS C	795-2304	+5
972	BOND M LUTHER	795-4081	+5
973	RUPE VERA F	795-7926	+5
977	LUCERN JOS C	795-2272	+5
980	ROUSE DONALD W	795-2649	+5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1985

COUNTY LINE RD W 92320 CALIMESA

169	PRIDDY ROWENA G	795-8308 +5
185	JONES CHAS P	795-6364 +5
193	SWEET WALTER	795-2381 +5
213	CHOCHRAN D H	795-3772 +5
	FIFELSKI JANINE	795-7914 +5
	GROFF PAUL	795-6686 +5
	HANSON BARRY L	795-5415 +5
217	BICE JIM W	795-1024 +5
	BOLING J W	795-1830 +5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1985

COUNTY LINE RD W		92320 CONT
	JOHNSON JOHN	795-8719 +5
	RICE JOHN D	795-1024 +5
	VANSANDT GEO	795-7266 +5
221	SMITH FRANK P	795-4101 +5
225	PRICE WM	795-4510 +5
227	CORNELL LORRAINE	795-7963 +5
239	WHITE THOS	795-9333 +5
245	MARTIN MARY	795-2862 +5
279	CURTIS ELSIE K	795-5273 +5
295	CALIMESA PRINTING	795-3010 +5
	FORBES FORREST D	795-3010 +5
301	7 ELEVEN FOOD	795-6735 +5
327	PRESIADO DELIA B	795-2139 +5
345	EMANUELE JOHN	795-7859 +5
361	AMBACH GEO	795-5176 +5
367	CHERYLS HAIR VILLA	795-1566 +5
	MCDANIELS GARAGE	795-6590 +5
371	JONES LYLE W	795-5458 +5
409	PARKINSON BOB	795-9313 +5
415	NELSEN BILL	795-3455 +5
	TRADER BILL REALTY	795-3455 +5
419	DOHERTY MICHAEL	795-9225 +5
431	EPPLER J W	795-1900 +5
459	ELRANCHO CALIMESA	795-5151 +5
	JOHNSON BECKY	795-8705 +5
471	BERMUDEZ JOE A	795-8891 +5
479	LARSEN GLEN M	795-5584 +5
555	COUNTY LINE SALOON	795-8607 +5
569	FITCH MILDRED L	795-1539 +5
575	BLUE RIBBON REALTY	795-7250 +5
	JEFFRESY JIM BLUE	795-7250 +5
577	MORROW JESS	795-2037 +5
	VAN ANTWERP PAT	795-2037 +5
579	CALIMESA DENTAL	795-8926 +5
595	OLYMPIC DONUTS	795-9282 +5
601	CALIMESA MEDICAL	795-2551 +5
	LAM FRED MD	795-2551 +5
	LOO CHARLES MD	795-2551 +5

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

3RD ST 1981

3RD 92320 CALIMESA

917½	HUBERT CLARENCE	795-7477	+1
918	XXXX	00	
920	MATSUDA MIKE	795-3796	+1
925	FINLEY VERLYN	795-7048	0

FORMATION ON THIS PAGE MAY NOT BE KEYPUNCHED

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

3RD ST 1981

3RD 92320 CONT

937	XXXX	00	
940	DALEN HAROLD	795-4087	
941	TOY T J	795-4717	5
945	XXXX	00	
947	BARNETT MARY	795-4901	+1
948	BREWER PHILLIP	795-7178	0
954	BROOKS BILLY	795-3654	9
962	GREEN JAS EJR	795-6684	+1
963	XXXX	00	
965	SCHOLZ WILLIAM W	795-4900	9
970	SHOOP CHAS C	795-2304	
972	BOND M LUTHER	795-4081	
973	RUPE VERA F	795-7926	+1
977	LUCERO JOS C	795-2272	7
980	ROUSE DONALD W	795-2649	
990	XXXX	00	

Target Street	**Cross Street**	**Source**
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1981

COUNTY LINE RD W 92320 CALIMESA

125	XXXX	00
165	GENDRON GERARD	794-7745 +1
169	WILLIAMS HUBERT E	795-6096 0
175	SCHUTTEN JERRY M	795-6908 +1
193	SWEET WALTER	795-2381 9
213	CHIRRICK ARTHUR	795-5755 0
	COCHRAN D H	795-3772 8
	GROFF PAUL	795-6686 0
	HORII JANE	795-2891 9
217	APARTMENTS	
	BICE JIM W	795-1024 +1
	BICE JOHN D	795-1024 +1
2	BOLING J W MRS	795-1830 4
	EMERY SUSAN	795-7744 0
	GUST MAYNARD	795-6449 8
	PURCELL MAX	795-7532 +1
217		
221	SMITH FRANK P	795-4101 6
223	XXXX	00
225	CONN FRANKIE	795-7135 0
	SIMMONS C L	795-4185 9
227	EDGE HAROLD	795-4831 +1
	SMITH AVIS	795-7343 +1
231	SCHULTZ DAVID R	795-2884 9
233	CARR L	795-5596 +1
	WHITE BEVERLY	795-3025 +1
239	WOHLERS E CAROL	795-1971 8
245	MARTIN MARY J	795-1823 +1
255	OSMUNSON E R	795-4574
265	XXXX	00
273	VISE AARON	795-4254 7
277	XXXX	00
279	XXXX	00
287	**BEARD SHOE REPAIR**	**795-4473** 6
295	**CALIMESA PRINTING**	**795-3010**
	FORBES FORREST D	795-3010 6
301	**SEVEL RLTY NO 13980**	**795-6735** +1
317	RIVERA HERMINIA	795-7575 0
325	XXXX	00
327	PRESIADO DELIA B	00
331	XXXX	795-2139 +1
345	**STROUT REALTY**	00
355	TIEDEMANN DAN	795-3639 +9
361	AMBACH GEO	795-5178 9
371	JONES LYLE W	795-5458 4
409	NELSEN BILL	795-3416 +1
	TRADER BILL REALTY	**795-3455** +1
	WHEELS WEST	**795-3416** +1
415	THRASHER VENESSIA	795-1369 +7
419	BRIMER NORMA	795-3467 +1
421	KING L R	795-6988 +1
423	THOMAS GENE	795-3701 +1
431	EPPLER J W	795-1900
441	KASSAY LOUIS	795-5551
459	XXXX	00
471	PARILLA JOSEPH COL	795-5505 +
479	LARSEN G M	795-7805 +
501	VEGA DOMINGO O	795-3086 +
543	**RAMEY REALTY**	**795-1510**

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1975

COUNTY LINE RD W 92320 CALIMESA

185½	SELLS LEE	795-5700+5
213	LITCHIE RAYMOND E	795-5725+5
	LOCKARD STEVE W	795-3396+5
217....APARTMENTS		
	BOLING J W MRS	795-1830 4
	DEAN LEE	795-[illegible]924+5
	DRUEHL EDW	795-5924+5
	LEWIS PINKEY	795-3102+5
	OSTDIEK GARY	795-3844+5
		795-3844+5
	SMITH KEN	795-5454 4
217........................		4
221A	HOUSER RUSSEL E	795-[illegible]
B	YARUSH JOHN 3D	795-6005 3
223	WARNER MARK	795-3733 4
A	KINSELLA WM A	795-4208+5
225	HUMPHRIES B J	795-1507 4
227	CROWTHER GARY	795-3191 4
231	BURCH M	795-2107+5
233	SCHULTZ ALMA	795-3475+5
		795-4547 4

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1975

..COUNTY LINE RD W 92320 CONT.

255	OSMUNSON E R	795-4574
277	XXXX	00
279	CURTIS ELSIE K	795-5273
295*	CALIMESA PRINTING	795-3010
	FORBES FORREST D	795-3010
301*	7 11 ROOD STR 749	795-3015
317	GARCIA ELIBARDO M	795-4768
345	XXXX	00
361	AMBACH GEO	795-5176
371	JONES LYLE W	795-5458
419	XXXX	00
421A	MILLER HARRY E	795-2139+5
423	HOUSER HARRY V	795-6037+5
427	SNEVELY WM J	795-5768
431	GINTER WENDELL	795-4300
441	KASSAY LOUIS	795-5551
459	ANDREWS R W	795-3406+5
	LIMING O B	795-2911+5
543*	RAMEY REALTY	795-1510 4
555	XXXX	00
557*	KIVETT DON REALTY	795-2447 4
577	PAYNE HOWARD	795-3522 3
579	LAWRENCE ROY B	795-2413 3
	*MILLER RUTH INC	795-2413 3
597*	DONUT HUT THE	795-1315 3
601*	COPPER DOOR	795-9043

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

3RD ST 1971

3RD 92320 CALIMESA

920	TOENJES H D	795-463
925	FINN DENNIS M	795-382
937	PIERCE STEPHEN	795-332
940	DALEN HAROLD	795-408
947	HECK OSCAR	795-406
948	CHURCHILL THOS W	795-368
962	PREVATTE JAS L	795-194
963	PATTERSON P E	795-330
970	SHOOP CHAS C	795-230
972	BOND M LUTHER	795-408
973	SCHLEPER DARRELL	795-40
975	BLAKE EMERY A	795-61
977	CAMPBELL MINNIE	795-30
	CAMPBELL WALLACE E	795-30
980	ROUSE DONALD W	795-26
990½	GILSON WM H	795-530

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W COUNTY LINE RD 1971

COUNTY LINE RD W 92320 CALIM

129 CREECH JERRY 795-52
223 WILEY JOHN 795-51
225 MAWHINNEY LYN 795-35
227B SEIVENO DONALD H 795-27
231B DEMOTT CLARALOU 797-74
239 SHULTZ CECIL 795-44
255 OSMUNSON E R 795-45
273 KEGEBEIN DAVID W 795-61
279 CURTIS ELSIE K 795-52
287*LERUDE VILA 795-18
295*CALIMESA PRINTING 795-30
FORBES FORREST D 795-30
345 STEWART LOUIS R 795-21
355 ROBERTS VERNA 795-55
361 AMBACH GEO 795-51
419 ANDREWS HOWARD 795-14
427 SNEVELY WM J 795-57
431 GINTER WENDELL 795-43
441 KASSAY LOUIS 795-55
459 STEPHENSON ALBERT 795-43
543*LOWRY REAL ESTATE 795-15
555 LOFLAND HENRY C 797-27
557*BENNETT E L REALTY 799-13
*CAL FARM INS CO 795-4
*FARM BUREAU INS 795-4
575 STEWART BEN 795-5
577 MILEM JOHN W 795-4
579 LAWRENCE ROY B 795-1
*MILLER R INC RLTORS795-1
597*BURGER HUT 795-2
601*COPPER DOOR 795-9

APPENDIX F

Color Site Photographs

Photo 1 - View facing south from the approximate northeast corner of the subject site. Offsite to the left (east) are single-family residences and associated properties. In the far background to the right are single-family residences and associated properties, located across a concrete-lined flood control channel (Calimesa Channel).

Photo 2 - View to the right of that shown in the previous photograph, facing southwest, looking across the subject site.

Photo 3 - View to the right of that shown in the previous photograph, facing west across the north side of the subject site. In the far background at/near the right edge is West County Line Road, beyond which is light commercial development.

Photo 4 - View to the right of that shown in the previous photograph, facing offsite to the northwest towards West County Line Road, beyond which are realtors, lender, insurance companies, property management, restaurants, liquor store, clothing store, dentist, optometrist, and medical group.

Photo 5 - View to the right of that shown in the previous photograph, facing northeast. Across West County Line Road to the right is a self car wash.

Photo 6 - Easterly view to the right of that shown in the previous photograph, looking offsite towards a 7 Eleven, addressed 301 West County Line Road, which formerly had two 10,000-gallon gasoline underground storage tanks. This 7 Eleven is located approximately 85 feet east of the subject site.

Photo 7 - Southeasterly view in the northeast portion of the subject site, showing an infiltration test location with an approximate 3-inch diameter percolation pipe within an approximate 8-inch diameter borehole. Around thirty of these infiltration test locations were observed onsite roughly 50 feet apart, in six roughly aligned rows, with around five locations along each row. The wooden stakes at the infiltration test locations indicated borehole depths of 20 or 40 feet below the ground surface.

Photo 8 - View facing north from the southeast corner of the subject site.

Photo 9 - View to the left of that shown in the previous photograph, facing northwest across the subject site.

Photo 10 - View to the left of that shown in the previous photograph, facing west along the south subject site boundary. To the left is the Calimesa Channel, a concrete-lined flood control channel around 5 to 6 feet deep. Beyond the channel to the left (south) are single-family residences with associated properties.

Photo 11 - The infiltration test location shown is the southwesternmost onsite. To the left of the percolation pipe at this location is a small amount of oil-stained soil, as evidenced by the darker soil shown in the photograph.

Photo 12 - View facing west showing a concrete pad in/near the southwest corner of the subject site. Within the concrete pad (5' by 5') is a steel manhole cover, labeled "YVWD SEWER", likely an acronym standing for Yucaipa Valley Water District sewer.

Photo 13 - View facing east from the concrete pad shown in the previous photograph.

Photo 14 - View to the left of that shown in the previous photograph, facing northeast across the subject site.

Photo 15 - View to the left of that shown in the previous photograph, facing northerly along the west subject site boundary. The offsite property to the left includes numerous trees, many of which are dead, and dilapidated wooden frames for old buildings/structures.

Photo 16 - View to the west near where the previous photograph was taken, looking offsite towards an old, wooden, dilapidated building/structure.

Photo 17 - View facing southwest beyond fencing along the west subject site boundary. One open top drum is situated inside another next to the blue, steel 55-gallon drum. The blue drum is enclosed, and it is not apparent what its contents are. These drums are located offsite, approximately 10 feet west of the subject site.

Photo 18 - View facing south from the estimated northwest corner of the subject site. The offsite properties to the right (west) are larger lot residential properties, some of which appear to include past agricultural and/or commercial activities.

Photo 19 - View to the left of that shown in the previous photograph, facing southeast across the subject site.

Photo 20 - View to the left of that shown in the previous photograph, facing east along the north subject site boundary. The ground topography in the foreground of this and the previous photograph appears to be elevated roughly 2 feet above the surrounding ground surface, and may be related to the demolition of a former single-family residence, the location of which is shown in the next photograph.

Photo 21 - View to the left of that shown in the previous photograph, facing north offsite towards a former single-family residence where remnant asphalt pavement remains. This former residence was situated within a parcel of land associated with, but not part of the subject site.

APPENDIX G

CRDEH Records Response Letters
Dated November 5, 2019

County of Riverside
DEPARTMENT OF ENVIRONMENTAL HEALTH

STEVE VAN STOCKUM, DIRECTOR

RELEASE OF RECORDS RESPONSE

November 5, 2019

Service Request No: 46306

LOR Geotechnical Group, Inc
6121 Quail Valley Court
Riverside, CA 92507
Attn: Mathew L. Hunt

Your request concerning **Hazardous Materials Management Records** has been received and a file search has been conducted. The appropriate action has been taken.

Site Address	City	Records Found
300-370 West County Line Rd.	**Calimesa**	**☒ YES ☐ NO**
THIS IS NOT AN INVOICE	Estimated Cost	$6.65

If no records are found, no further action will be taken.

If records are found, please contact our office at (951) 358-5055 to schedule a file review appointment. Records will be available for 30 days from the date of this letter, after which a new Records Request will need to be submitted.

** There is a clerical records research fee of **$.50 for the first page, plus $.10 per additional page **Records will not be made available until this fee is paid****

Other fees may apply

Note: Additional time for processing may be required

Appointments are scheduled in one (1) hour increments, not to exceed two (2) hours.

Environmental Protection & Oversight Division
Hazardous Materials Management Branch
Attn: Records Management
P.O. Box 7909
Riverside, CA 92513-7909
Ph: (951) 358-5055
Fax (951) 358-5342

*additional fees may include costs for appt. cancellation/no show, time per service, scan/fax/mail of documents, cd/dvd

County of Riverside

DEPARTMENT OF ENVIRONMENTAL HEALTH

STEVE VAN STOCKUM, DIRECTOR

RELEASE OF RECORDS RESPONSE

November 5, 2019

Service Request No: 46307

LOR Geotechnical Group, Inc
6121 Quail Valley Court
Riverside, CA 92507
Attn: Mathew L. Hunt

Your request concerning **Hazardous Materials Management Records** has been received and a file search has been conducted. The appropriate action has been taken.

Site Address	City	Records Found
900-950 3rd St.	**Calimesa**	**☐ YES ☒ NO**
THIS IS NOT AN INVOICE	Estimated Cost	$0.00

If no records are found, no further action will be taken.

***If records are found, please contact our office at (951) 358-5055 to schedule a file review* appointment.** Records will be available for 30 days from the date of this letter, after which a new Records Request will need to be submitted.

** There is a clerical records research fee of **$.50 for the first page, plus $.10 per additional page **Records will not be made available until this fee is paid****

Other fees may apply

Note: Additional time for processing may be required

Appointments are scheduled in one (1) hour increments, not to exceed two (2) hours.

Environmental Protection & Oversight Division
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Attn: Records Management
P.O. Box 7909
Riverside, CA 92513-7909
Ph: (951) 358-5055
Fax (951) 358-5342

*additional fees may include costs for appt. cancellation/no show, time per service, scan/fax/mail of documents, cd/dvd

APPENDIX H

EDR Environmental Database Report

Calimesa Channel Basin Stage III
West County Line Road/3rd Street
Calimesa, CA 92320

Inquiry Number: 5842101.2s
October 24, 2019

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

GEOCHECK ADDENDUM

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

WEST COUNTY LINE ROAD/3RD STREET
CALIMESA, CA 92320

COORDINATES

Latitude (North):	34.0032410 - 34˚ 0' 11.66''
Longitude (West):	117.0488710 - 117˚ 2' 55.93''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	495486.9
UTM Y (Meters):	3762322.0
Elevation:	2479 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5630639 YUCAIPA, CA
Version Date:	2012
South Map:	5640934 EL CASCO, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140530
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
WEST COUNTY LINE ROAD/3RD STREET
CALIMESA, CA 92320

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	7-ELEVEN STORE 13980	301 COUNTY LINE RD	HIST UST	Higher	227, 0.043, NE
A2	CALIMESA DENTAL	34636 COUNTY LINE RD	RCRA NonGen / NLR	Lower	238, 0.045, NNW
A3	CASA TREJO	34636 COUNTY LINE RD	San Bern. Co. Permit	Lower	238, 0.045, NNW
4	ARCO #83180	1216 CALIMESA BLVD	LUST, CERS HAZ WASTE, CERS TANKS, Notify 65, CERS	Lower	4077, 0.772, SW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL - National Priority List
Proposed NPL - Proposed National Priority List Sites
NPL LIENS - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY - Federal Facility Site Information listing
SEMS - Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE - Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS - Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF - RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG - RCRA - Large Quantity Generators
RCRA-SQG - RCRA - Small Quantity Generators
RCRA-VSQG - RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS - Land Use Control Information System

EXECUTIVE SUMMARY

US ENG CONTROLS - - - - - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - - - - - Sites with Institutional Controls

Federal ERNS list

ERNS - Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE - - - - - - - - - - - - - - - - - State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR - - - - - - - - - - - - - - - EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF - Solid Waste Information System

State and tribal leaking storage tank lists

LUST - Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST - - - - - - - - - - - - - - - Leaking Underground Storage Tanks on Indian Land
CPS-SLIC - - - - - - - - - - - - - - - - - - - Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST - - - - - - - - - - - - - - - - - Underground Storage Tank Listing
UST - Active UST Facilities
AST - Aboveground Petroleum Storage Tank Facilities
INDIAN UST - - - - - - - - - - - - - - - - Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

VCP - Voluntary Cleanup Program Properties
INDIAN VCP - - - - - - - - - - - - - - - - Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS - - - - - - - - - - - - - Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - - - - - - - - - - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT - - - - - - - - - - - - - Waste Management Unit Database
SWRCY - Recycler Database
HAULERS - - - - - - - - - - - - - - - - - - - Registered Waste Tire Haulers Listing
INDIAN ODI - - - - - - - - - - - - - - - - - Report on the Status of Open Dumps on Indian Lands
ODI - Open Dump Inventory

DEBRIS REGION 9 - Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS - Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL - Delisted National Clandestine Laboratory Register
HIST Cal-Sites - Historical Calsites Database
SCH - School Property Evaluation Program
CDL - Clandestine Drug Labs
CERS HAZ WASTE - CERS HAZ WASTE
Toxic Pits - Toxic Pits Cleanup Act Sites
US CDL - National Clandestine Laboratory Register
PFAS - PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

SWEEPS UST - SWEEPS UST Listing
CERS TANKS - California Environmental Reporting System (CERS) Tanks
CA FID UST - Facility Inventory Database

Local Land Records

LIENS - Environmental Liens Listing
LIENS 2 - CERCLA Lien Information
DEED - Deed Restriction Listing

Records of Emergency Release Reports

HMIRS - Hazardous Materials Information Reporting System
CHMIRS - California Hazardous Material Incident Report System
LDS - Land Disposal Sites Listing
MCS - Military Cleanup Sites Listing
SPILLS 90 - SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS - Formerly Used Defense Sites
DOD - Department of Defense Sites
SCRD DRYCLEANERS - State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR - Financial Assurance Information
EPA WATCH LIST - EPA WATCH LIST
2020 COR ACTION - 2020 Corrective Action Program List
TSCA - Toxic Substances Control Act
TRIS - Toxic Chemical Release Inventory System
SSTS - Section 7 Tracking Systems
ROD - Records Of Decision
RMP - Risk Management Plans
RAATS - RCRA Administrative Action Tracking System
PRP - Potentially Responsible Parties
PADS - PCB Activity Database System
ICIS - Integrated Compliance Information System
FTTS - FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS - Material Licensing Tracking System
COAL ASH DOE - Steam-Electric Plant Operation Data

EXECUTIVE SUMMARY

COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
ECHO	Enforcement & Compliance History Information
UXO	Unexploded Ordnance Sites
DOCKET HWC	Hazardous Waste Compliance Docket Listing
FUELS PROGRAM	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
Cortese	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings	CUPA Resources List
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
HAZNET	Facility and Manifest Data
ICE	ICE
HIST CORTESE	Hazardous Waste & Substance Site List
HWP	EnviroStor Permitted Facilities Listing
HWT	Registered Hazardous Waste Transporter Database
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing
PEST LIC	Pesticide Regulation Licenses Listing
PROC	Certified Processors Database
UIC	UIC Listing
UIC GEO	UIC GEO (GEOTRACKER)
WASTEWATER PITS	Oil Wastewater Pits Listing
WDS	Waste Discharge System
WIP	Well Investigation Program Case List
MILITARY PRIV SITES	MILITARY PRIV SITES (GEOTRACKER)
PROJECT	PROJECT (GEOTRACKER)
WDR	Waste Discharge Requirements Listing
CIWQS	California Integrated Water Quality System
CERS	CERS
NON-CASE INFO	NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS	OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS	PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT	SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ	Well Stimulation Project (GEOTRACKER)

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants

EDR Hist Auto - EDR Exclusive Historical Auto Stations
EDR Hist Cleaner - EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF - Recovered Government Archive Solid Waste Facilities List
RGA LUST - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
7-ELEVEN STORE 13980 Facility Id: 00000012383	301 COUNTY LINE RD	NE 0 - 1/8 (0.043 mi.)	1	8

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 06/24/2019 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CALIMESA DENTAL	34636 COUNTY LINE RD	NNW 0 - 1/8 (0.045 mi.)	A2	8

EXECUTIVE SUMMARY

EPA ID:: CAL000196056

San Bern. Co. Permit: San Bernardino County Fire Department Hazardous Materials Division.

A review of the San Bern. Co. Permit list, as provided by EDR, and dated 05/31/2019 has revealed that there is 1 San Bern. Co. Permit site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CASA TREJO Facility Status: INACTIVE Facility Id: FA0012476	34636 COUNTY LINE RD	NNW 0 - 1/8 (0.045 mi.)	A3	10

Notify 65: Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

A review of the Notify 65 list, as provided by EDR, and dated 06/17/2019 has revealed that there is 1 Notify 65 site within approximately 1 mile of the target property.

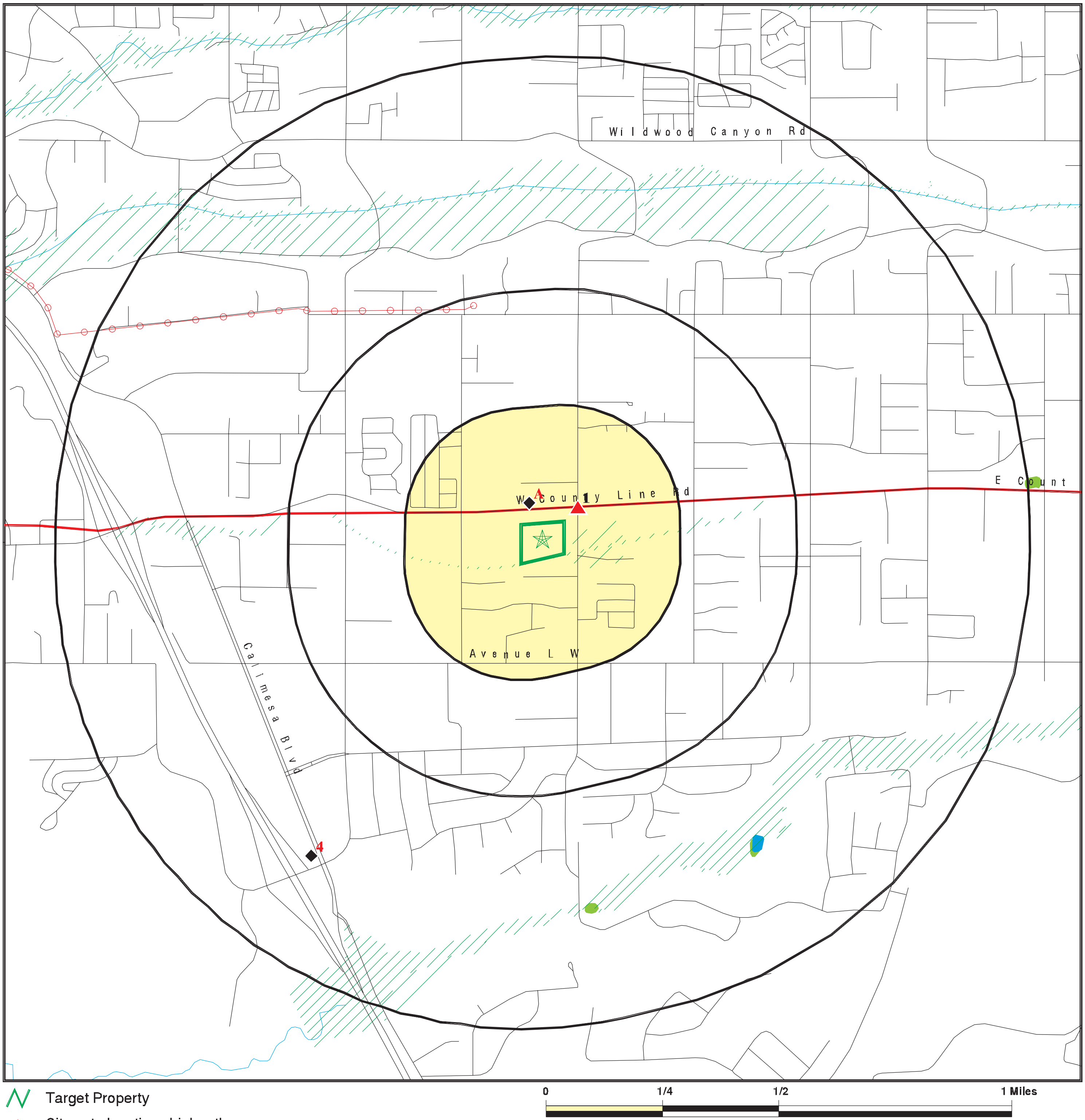
Lower Elevation	Address	Direction / Distance	Map ID	Page
ARCO #83180	***1216 CALIMESA BLVD***	***SW 1/2 - 1 (0.772 mi.)***	***4***	***10***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
	CDL

OVERVIEW MAP - 5842101.2S

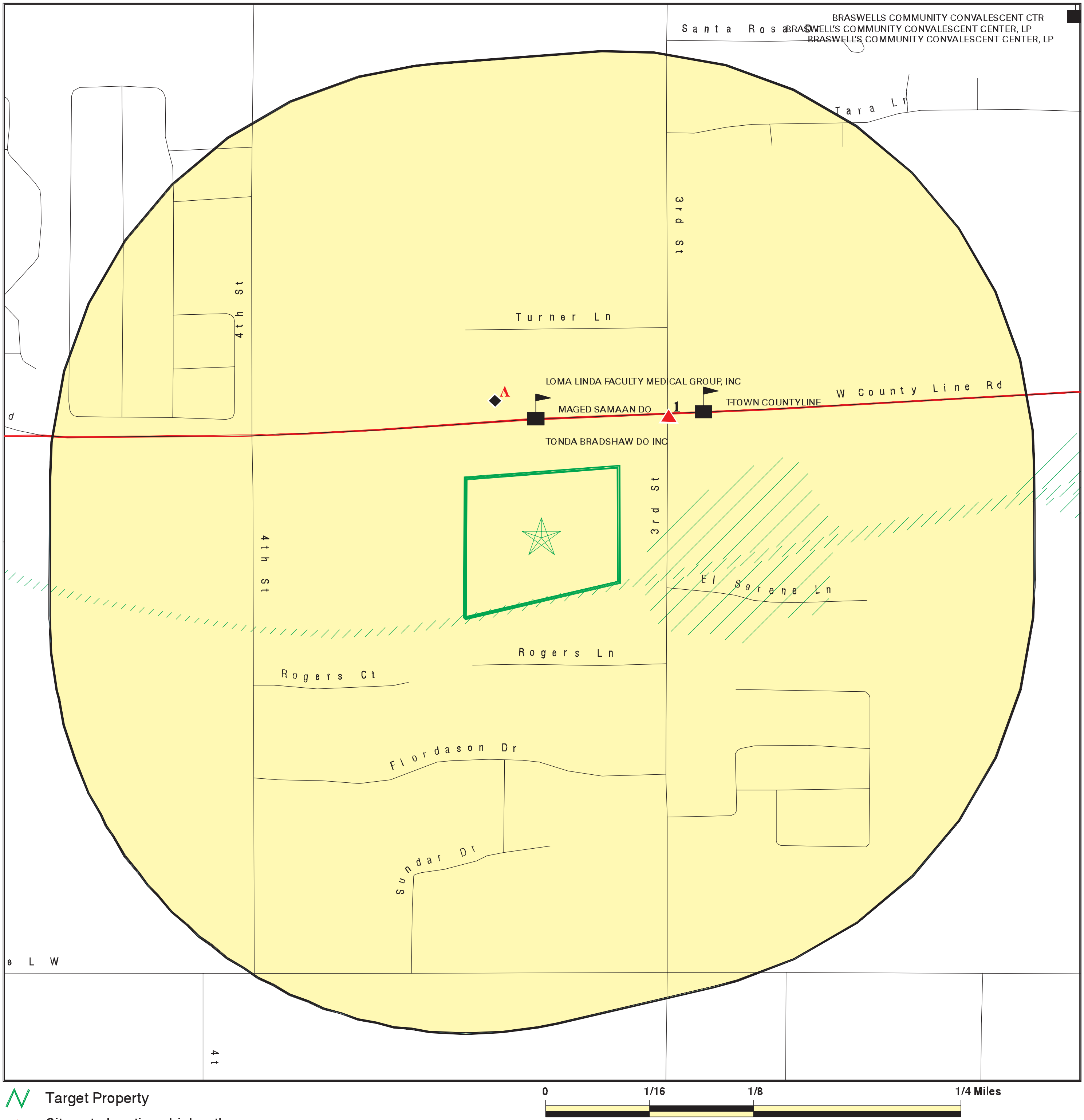


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Calimesa Channel Basin Stage III	CLIENT:	LOR Geotechnical Group, Inc.
ADDRESS:	West County Line Road/3rd Street	CONTACT:	Mathew L. Hunt
	Calimesa CA 92320	INQUIRY #:	5842101.2s
LAT/LONG:	34.003241 / 117.048871	DATE:	October 24, 2019 12:38 pm

DETAIL MAP - 5842101.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Calimesa Channel Basin Stage III	CLIENT:	LOR Geotechnical Group, Inc.
ADDRESS:	West County Line Road/3rd Street Calimesa CA 92320	CONTACT:	Mathew L. Hunt
		INQUIRY #:	5842101.2s
LAT/LONG:	34.003241 / 117.048871	DATE:	October 24, 2019 12:39 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		1	0	NR	NR	NR	1
CERS TANKS	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
San Bern. Co. Permit	0.250		1	0	NR	NR	NR	1
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	1	NR	1
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	3	0	0	1	0	4

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

MAP FINDINGS

1
NE
< 1/8
0.043 mi.
227 ft.

7-ELEVEN STORE 13980 (2131)
301 COUNTY LINE RD
CALIMESA, CA 92320

HIST UST **U001574612** **N/A**

Relative: Higher
Actual: 2490 ft.

HIST UST:

Name:	7-ELEVEN STORE 13980 (2131)
Address:	301 COUNTY LINE RD
City,State,Zip:	CALIMESA, CA 92320
File Number:	0001FA14
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001FA14.pdf
Region:	STATE
Facility ID:	00000012383
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	MARK AND CHRISTINE BROGEN
Telephone:	7148620380
Owner Name:	THE SOUTHLAND CORPORATION
Owner Address:	1240 S. STATE COLLEGE BLVD., S
Owner City,St,Zip:	ANAHEIM, CA 92806
Total Tanks:	0002

Tank Num:	001
Container Num:	01
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

Tank Num:	002
Container Num:	02
Year Installed:	Not reported
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

A2
NNW
< 1/8
0.045 mi.
238 ft.

CALIMESA DENTAL
34636 COUNTY LINE RD STE 19
YUCAIPA, CA 92399

Site 1 of 2 in cluster A

RCRA NonGen / NLR **1024798130** **CAL000196056**

Relative: Lower
Actual: 2475 ft.

RCRA NonGen / NLR:

Date form received by agency:	1999-03-31 00:00:00.0
Facility name:	CALIMESA DENTAL
Facility address:	34636 COUNTY LINE RD STE 19 YUCAIPA, CA 92399-0000
EPA ID:	CAL000196056
Contact:	KIM LAMMERS
Contact address:	34636 COUNTY LINE RD STE 19 YUCAIPA, CA 92399-0000
Contact country:	Not reported
Contact telephone:	909-795-2585

CALIMESA DENTAL (Continued) **1024798130**

Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	KIM LAMMERS
Owner/operator address:	34636 COUNTY LINE RD STE 19 YUCAIPA, CA 92399
Owner/operator country:	Not reported
Owner/operator telephone:	909-795-2585
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Other
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	RICHARD RAMOS
Owner/operator address:	34636 COUNTY LINE RD STE #19 YUCAIPA, CA 92399
Owner/operator country:	Not reported
Owner/operator telephone:	909-795-2585
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Other
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	Yes
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status:	No violations found

A3 NNW < 1/8 0.045 mi. 238 ft.	**CASA TREJO 34636 COUNTY LINE RD YUCAIPA, CA 92399** **Site 2 of 2 in cluster A**	**San Bern. Co. Permit**	**S109598500 N/A**

Relative: Lower
Actual: 2475 ft.

San Bern. Co. Permit:

Name:	CASA TREJO
Address:	34636 COUNTY LINE RD
City,State,Zip:	YUCAIPA, CA 92399
Region:	SAN BERNARDINO
Facility ID:	FA0012476
Owner:	ERLINDA ENTERPRISES LLC
Permit Number:	PT0021769
Permit Category:	BULK CO2 AT RETAIL FOOD FACILITIES
Facility Status:	INACTIVE
Expiration Date:	05/31/2010

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4 SW 1/2-1 0.772 mi. 4077 ft.	**ARCO #83180 1216 CALIMESA BLVD CALIMESA, CA 92320**	**LUST CERS HAZ WASTE CERS TANKS Notify 65 CERS**	**S100178801 N/A**

Relative: Lower
Actual: 2407 ft.

LUST:

Name:	ARCO CALIMESA #1958
Address:	1216 CALIMESA BLVD.
City,State,Zip:	CALIMESA, CA 92320
Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000001842
Global Id:	T10000001842
Latitude:	33.993451
Longitude:	-117.057683
Status:	Completed - Case Closed
Status Date:	06/30/2017
Case Worker:	SCB
RB Case Number:	Not reported
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Local Agency
Local Case Number:	201032797
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Soil samples were taken December 22, 2009 during tank and piping removal activities. Up to 29 ppm TPHg, 990 ppb 1,2,4-TMB, 280 ppb 1,3,5-TMB, 770 ppb benzene, 410 ppb ethylbenzene, 2640 ppb total xylenes, 2200 ppb toluene, and 86000 ppb ethanol was detected under the piping. A total of 10.65 tons of impacted soil was removed from the site on March 11, 2010 in the vicinity of PD2-2. Soil samples taken at the bottom of the excavation at 7 had 1930 ppm TPHg, 29.2 ppm benzene, 503 ppm toluene, 721 ppm xylenes, 2.89 ppm MTBE, 19.1 ppm naphthalene, 260 ppm 1,2,4-TMB, 84.6 ppm 1,3,5-TMB, 22.4 ppm n-butylbenzene, 13.6 ppm isopropylbenzene, 5.2 ppm sec-butylbenzene and 6.3 ppm 4-isopropyltoluene. The pit was excavated deeper and soil samples were taken from the bottom at 10.5. Sample results showed 0.134 ppm TPHg, 0.075 ppm benzene, 0.659 ppm toluene, 9.06 ppm xylenes, 0.336 ppm MTBE, 3.69 ppm naphthalene, 11.1 ppm 1,2,4-TMB, 3.2 ppm 1,3,5-TMB, 1.89 ppm n-butylbenzene, 0.232 ppm isopropylbenzene, 0.23 ppm sec-butylbenzene and 0.32 ppm 4-isopropyltoluene Five soil borings (FB1 through FB5) were drilled

ARCO #83180 (Continued) **S100178801**

to 54 to 61.5 feet bg surrounding the excavation pit at PD2-2 on June 2 to 4, 2015. Soil samples were taken at 2.5 feet and 5 feet and every 5 foot after to depth. FB1 was drilled next to SS-S-2 had 0.013 ppm xylenes at 2.5 feet bg; 1.5 ppm TPHg, 0.0066 ppm ethylbenzene, and 0.017 ppm xylenes at 5 feet bg; and 16 ppm TPHg, 28 ppm TPHd, 0.0052 ppm toluene, 0.026 ppm ethylbenzene, and 0.25 ppm xylenes at 10 feet bg. FB2 was drilled 10 feet northeast of the excavation and did not have any detectable hydrocarbons. FB3 was drilled 10 feet southeast of the excavation and had 2.3 ppm TPHg, 0.0079 ppm ethylbenzene, and 0.014 ppm at 5 feet bg. FB4 was drilled 10 feet southwest of the excavation and had 7.5 ppm TPHg, 18 ppm TPHg, 0.056 ppm ethylbenzene and 0.3 ppm xylenes at 5 feet bg. FB5 was drilled 10 feet northwest of the excavation and had 6.8 ppm THg, 15 ppm TPHd, 0.066 ppm toluene, 0.15 ppm ethylbenzene, and 0.65 ppm xylenes at 5 feet bg; and 12 ppm, 31 ppm TPHd, 0.055 ppm toluene, 0.21 ppm ethylbenzene, and 0.78 ppm xylenes at 10 feet bg. Vapor extraction wells (FB4/VE1 and FB5/VE2) were installed in FB4 and FB5. VE4 was screened from 10 to 20 feet and VE5 was screened from 5 to 20 and 30 to 45 feet. Impacted soil remains in sidewall (SS-S-2) and in the bottom of the excavation at 10.5 ft (SS-1-10.5), however, boring FB1 was drilled at the excavation sidewall where SS-S-2 was collected and soil samples from 2.5 ft and 5 ft were at or below the detection limits, indicating detections at SS-S-2 were very limited. Further, FB1 was within 5-ft of SS-1-10.5, also indicating detections in the bottom of the former excavation were very limited.

LUST:

Global Id:	T10000001842
Contact Type:	Local Agency Caseworker
Contact Name:	SHARON BOLTINGHOUSE
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	sbolting@rivco.org
Phone Number:	9519558980

LUST:

Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/24/2010
Action:	Preliminary Site Assessment Workplan
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/30/2010
Action:	Site Assessment Report
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	10/15/2014
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/15/2014
Action:	Monitoring Report - Quarterly

ARCO #83180 (Continued) **S100178801**

Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/15/2015
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	02/17/2010
Action:	Notice of Responsibility - #RCDEH 021710
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	02/17/2010
Action:	Notice of Reimbursement - #RCDEH 021710
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	02/17/2010
Action:	Staff Letter - #RCDEH 021710
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	02/17/2010
Action:	Notification - Proposition 65 - #RCDEH 021710
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	02/17/2010
Action:	Unauthorized Release Form - #RCDEH 021710
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	03/09/2010
Action:	Staff Letter - #RCDEH 030910
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	06/01/2010
Action:	Staff Letter - #rcdeh 060110
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	10/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/15/2012
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE

ARCO #83180 (Continued) **S100178801**

Date:	04/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	10/15/2010
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/15/2011
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	04/05/2011
Action:	Staff Letter - #RCDEH 040511
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	01/24/2017
Action:	LOP Case Closure Summary to RB - #RCDEH#012417
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	01/26/2017
Action:	Staff Letter - #RCDEH#012617
Global Id:	T10000001842
Action Type:	Other
Date:	02/17/2010
Action:	Leak Discovery
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	06/14/2017
Action:	Well Destruction Report
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/17/2017
Action:	Other Report / Document
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	02/23/2017
Action:	Other Report / Document

ARCO #83180 (Continued) **S100178801**

Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	06/30/2017
Action:	File review - #RCDEH uploaded site file 2/26/2016
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	07/01/2016
Action:	Email Correspondence
Global Id:	T10000001842
Action Type:	Other
Date:	12/21/2009
Action:	Leak Stopped
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/15/2012
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/15/2012
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/30/2010
Action:	Preliminary Site Assessment Workplan - Addendum - Regulator Responded
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	06/26/2015
Action:	Preliminary Site Assessment Report - Regulator Responded
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/24/2017
Action:	Request for Closure - Regulator Responded
Global Id:	T10000001842
Action Type:	REMEDIATION
Date:	03/11/2010
Action:	Excavation
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	10/15/2012
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/15/2013
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	ENFORCEMENT

ARCO #83180 (Continued) **S100178801**

Date:	12/14/2016
Action:	File review - #RCDEH site summary
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	01/24/2017
Action:	File Review - Closure
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/15/2013
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	Other
Date:	02/17/2010
Action:	Leak Reported
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	07/15/2013
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	10/15/2013
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	01/15/2014
Action:	Monitoring Report - Quarterly
Global Id:	T10000001842
Action Type:	ENFORCEMENT
Date:	06/30/2017
Action:	Closure/No Further Action Letter - #RCDEH NFA
Global Id:	T10000001842
Action Type:	RESPONSE
Date:	04/15/2014
Action:	Monitoring Report - Quarterly

LUST:

Global Id:	T10000001842
Status:	Open - Case Begin Date
Status Date:	12/21/2009
Global Id:	T10000001842
Status:	Open - Site Assessment
Status Date:	02/17/2010
Global Id:	T10000001842
Status:	Open - Eligible for Closure
Status Date:	01/26/2017
Global Id:	T10000001842

ARCO #83180 (Continued) **S100178801**

Status:	Completed - Case Closed
Status Date:	06/30/2017

Name:	ARCO #1958
Address:	1216 CALIMESA BLVD
City,State,Zip:	CALIMESA, CA 92320
Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500105
Global Id:	T0606500105
Latitude:	33.9933490947651
Longitude:	-117.057568150787
Status:	Completed - Case Closed
Status Date:	08/26/2008
Case Worker:	Not reported
RB Case Number:	083301053T
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	89624
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	PREVIOUSLY CLOSED 6/14/89. REOPENED and closed again 8/26/2008. USTs replaced - new site opened 2-17-2010.

LUST:

Global Id:	T0606500105
Contact Type:	Regional Board Caseworker
Contact Name:	VALERIE JAHN-BULL
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	valerie.jahn-bull@waterboards.ca.gov
Phone Number:	9517824903

LUST:

Global Id:	T0606500105
Action Type:	Other
Date:	05/24/1989
Action:	Leak Discovery

Global Id:	T0606500105
Action Type:	RESPONSE
Date:	11/01/2007
Action:	Other Workplan

Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	10/29/2007
Action:	Staff Letter - #10/29/07

Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	02/22/2008
Action:	Staff Letter - #022208

Global Id:	T0606500105

ARCO #83180 (Continued) **S100178801**

Action Type:	ENFORCEMENT
Date:	01/17/2008
Action:	File review
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	09/11/2007
Action:	Staff Letter - #091107
Global Id:	T0606500105
Action Type:	Other
Date:	05/24/1989
Action:	Leak Stopped
Global Id:	T0606500105
Action Type:	REMEDIATION
Date:	10/13/2005
Action:	Soil Vapor Extraction (SVE)
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	08/17/2006
Action:	Staff Letter - #081706
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	07/31/2007
Action:	File review
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	01/28/2008
Action:	File review
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	11/17/2006
Action:	Other Report / Document
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	04/15/2007
Action:	Remedial Progress Report
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	05/18/2007
Action:	File review
Global Id:	T0606500105
Action Type:	Other
Date:	09/25/1988
Action:	Leak Reported
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	07/15/2007

ARCO #83180 (Continued) **S100178801**

Action:	Remedial Progress Report
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	10/15/2007
Action:	Remedial Progress Report
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	05/22/2008
Action:	Unknown
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	08/26/2008
Action:	Closure/No Further Action Letter - #Riv Co Closure
Global Id:	T0606500105
Action Type:	ENFORCEMENT
Date:	04/15/2003
Action:	File review
Global Id:	T0606500105
Action Type:	RESPONSE
Date:	12/29/2007
Action:	Other Report / Document

LUST:

Global Id:	T0606500105
Status:	Open - Case Begin Date
Status Date:	09/25/1988
Global Id:	T0606500105
Status:	Open - Remediation
Status Date:	09/25/1988
Global Id:	T0606500105
Status:	Open - Site Assessment
Status Date:	05/24/1989
Global Id:	T0606500105
Status:	Open - Site Assessment
Status Date:	02/11/1992
Global Id:	T0606500105
Status:	Open - Remediation
Status Date:	10/13/2005
Global Id:	T0606500105
Status:	Open - Remediation
Status Date:	01/17/2007
Global Id:	T0606500105
Status:	Open - Remediation
Status Date:	05/18/2007
Global Id:	T0606500105

ARCO #83180 (Continued) **S100178801**

Status: Open - Remediation
Status Date: 07/31/2007

Global Id: T0606500105
Status: Completed - Case Closed
Status Date: 08/26/2008

RIVERSIDE CO. LUST:
Name: ARCO #1958
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA
Region: RIVERSIDE
Facility ID: 89624
Employee: Shurlow-LOP
Site Closed: Yes
Case Type: Soil only
Facility Status: closed/action completed
Casetype Decode: Soil only is impacted
Fstatus Decode: Closed/Action completed

Name: ARCO #1958
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA
Region: RIVERSIDE
Facility ID: 201032797
Employee: Shurlow-LOP
Site Closed: Yes
Case Type: Soil only
Facility Status: closed/action completed
Casetype Decode: Soil only is impacted
Fstatus Decode: Closed/Action completed

CERS HAZ WASTE:
Name: ARCO #83180
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA 92320
Site ID: 92989
CERS ID: 10327234
CERS Description: Hazardous Waste Generator

CERS TANKS:
Name: ARCO #83180
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA 92320
Site ID: 92989
CERS ID: 10327234
CERS Description: Underground Storage Tank

NOTIFY 65:
Date Reported: Not reported
Staff Initials: Not reported
Board File Number: Not reported
Facility Type: Not reported
Discharge Date: Not reported

ARCO #83180 (Continued) **S100178801**

Issue Date: Not reported
Incident Description: Not reported

Date Reported: Not reported
Staff Initials: Not reported
Board File Number: Not reported
Facility Type: Not reported
Discharge Date: Not reported
Issue Date: Not reported
Incident Description: Not reported

CERS:
Name: ARCO CALIMESA #1958
Address: 1216 CALIMESA BLVD.
City,State,Zip: CALIMESA, CA 92320
Site ID: 188845
CERS ID: T10000001842
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Local Agency Caseworker
Entity Name: SHARON BOLTINGHOUSE - RIVERSIDE COUNTY LOP
Entity Title: Not reported
Affiliation Address: 3880 LEMON ST SUITE 200
Affiliation City: RIVERSIDE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9519558980

Name: ARCO #1958
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA 92320
Site ID: 194182
CERS ID: T0606500105
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: VALERIE JAHN-BULL - SANTA ANA RWQCB (REGION 8)
Entity Title: Not reported
Affiliation Address: 3737 MAIN STREET, SUITE 500
Affiliation City: RIVERSIDE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9517824903

Name: ARCO #83180
Address: 1216 CALIMESA BLVD
City,State,Zip: CALIMESA, CA 92320
Site ID: 92989
CERS ID: 10327234
CERS Description: Chemical Storage Facilities

Violations:

ARCO #83180 (Continued) **S100178801**

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-08-2014
Citation:	HSC 6.7 Multiple Sections - California Health and Safety Code, Chapter 6.7, Section(s) Multiple Sections
Violation Description:	UST Program - Operations/Maintenance - General
Violation Notes:	Returned to compliance on 04/30/2014.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-07-2015
Citation:	HSC 6.7 25291 - California Health and Safety Code, Chapter 6.7, Section(s) 25291
Violation Description:	Failure to maintain under-dispenser containment, sumps, and/or other secondary containment in good condition and/or free of debris/liquid.
Violation Notes:	Returned to compliance on 05/05/2015.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-04-2018
Citation:	22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description:	Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes:	Returned to compliance on 07/30/2018.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-05-2017
Citation:	23 CCR 16 2632(c)(2)(B), 2634(d)(1)(a), 2636(f)(1) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2632(c)(2)(B), 2634(d)(1)(a), 2636(f)(1)
Violation Description:	Failure of the leak detection equipment to have an audible and visual alarm as required.
Violation Notes:	Returned to compliance on 04/05/2017.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-07-2015
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material

ARCO #83180 (Continued) **S100178801**

	inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 05/05/2015.
Violation Division:	Riverside County Department of Env Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-30-2019
Citation:	23 CCR 16 2665(b) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2665(b)
Violation Description:	"Failure to submit a copy of the overfill prevention equipment inspection results on the ?Overfill Prevention Equipment Inspection Report Form? to the UPA within 30 days after the inspection. "
Violation Notes:	Returned to compliance on 04/30/2019. OBSERVATION: An "Overfill Prevention Equipment Inspection Report Form"" was not submitted to this Department within 30 days after the completion of the test. Equipment was tested on 10/09/18. CORRECTIVE ACTION: Owner/operator shall immediately submit to this Department a complete and accurate copy of the Overfill Prevention Equipment Inspection Report Form for inspection completed on 10/09/18. Testing results provided while on site. *Corrected on site.* Note: This violation is being conditionally marked as "Corrected on site", plan check will review submitted results to determine compliance status.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-04-2018
Citation:	HSC 6.7 25284.2 - California Health and Safety Code, Chapter 6.7, Section(s) 25284.2
Violation Description:	Failure to test the spill bucket annually.
Violation Notes:	Returned to compliance on 04/25/2018.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-08-2014
Citation:	HSC 6.75 25299.30-25299.34 - California Health and Safety Code, Chapter 6.75, Section(s) 25299.30-25299.34
Violation Description:	Failure to submit and maintain complete and current Certification of Financial Responsibility or other mechanism of financial assurance.
Violation Notes:	Returned to compliance on 04/30/2014.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-05-2017
Citation:	HSC 6.7 25290.1(e) - California Health and Safety Code, Chapter 6.7, Section(s) 25290.1(e)

ARCO #83180 (Continued) **S100178801**

Violation Description:	Failure to maintain the interstitial space such that a breach in the primary or secondary containment is detected before the liquid or vapor phase of the hazardous substance stored in the UST tank is released into the environment, i.e., vapor, pressure, hydrostatic (VPH) monitoring.
Violation Notes:	Returned to compliance on 04/05/2017.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	05-24-2016
Citation:	HSC 6.7 25286(a) - California Health and Safety Code, Chapter 6.7, Section(s) 25286(a)
Violation Description:	Failure to submit an complete and accurate application for a permit to operate an underground storage tank, or for renewal of the permit.
Violation Notes:	Returned to compliance on 06/03/2016.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-30-2019
Citation:	23 CCR 16 2641(h) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2641(h)
Violation Description:	Failure to have an approved UST Monitoring Plan.
Violation Notes:	Returned to compliance on 04/30/2019. OBSERVATION: Observed UST Monitoring Plan for the 87 tank to be inaccurate. During inspection observed 87 tank being monitored by annular sensor 302. CORRECTIVE ACTION: Owner/operator shall make the following corrections to the UST Monitoring Plan(s) and submit in CERS. In CERS for Tank #1 [87 tank] correct annular sensor to indicate 302. *Corrected while on site.*
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-05-2016
Citation:	23 CCR 16 2712(i) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(i)
Violation Description:	Failure to maintain on site an approved monitoring plan.
Violation Notes:	Returned to compliance on 05/24/2016.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-04-2018
Citation:	23 CCR 16 2665 - California Code of Regulations, Title 23, Chapter 16, Section(s) 2665
Violation Description:	Failure to comply with one or more of the following: Failure to install or maintain a liquid-tight spill bucket. Have a minimum capacity of five gallons. Have a functional drain valve or other

ARCO #83180 (Continued) **S100178801**

	method for the removal of liquid from the spill bucket/spill container. Be resistant to galvanic corrosion.
Violation Notes:	Returned to compliance on 04/25/2018.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS
Site ID:	92989
Site Name:	Arco #83180
Violation Date:	04-05-2016
Citation:	HSC 6.7 25286(a) - California Health and Safety Code, Chapter 6.7, Section(s) 25286(a)
Violation Description:	Failure to submit an complete and accurate application for a permit to operate an underground storage tank, or for renewal of the permit.
Violation Notes:	Returned to compliance on 06/03/2016.
Violation Division:	Riverside County Department of Env Health
Violation Program:	UST
Violation Source:	CERS

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-04-2018
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-04-2018
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-04-2018
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-05-2016
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	CMD
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection

ARCO #83180 (Continued) **S100178801**

Eval Date:	04-05-2017
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Monitoring Certification
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-07-2015
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-07-2015
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-07-2015
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-30-2019
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Liquid observed in 87 fill sump. Observed slow leak occurring from components above shear valve at dispenser 11/12. While on site Manager made arrangements for dispenser to be looked at.
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	05-24-2016
Violations Found:	Yes
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Follow up inspection
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	06-03-2016

ARCO #83180 (Continued) **S100178801**

Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Follow up inspection
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	04-08-2014
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	Riverside County Department of Env Health
Eval Program:	UST
Eval Source:	CERS

Enforcement Action:

Site ID:	92989
Site Name:	Arco #83180
Site Address:	1216 CALIMESA BLVD
Site City:	CALIMESA
Site Zip:	92320
Enf Action Date:	04-07-2015
Enf Action Type:	Notice of Violation (Unified Program)
Enf Action Description:	Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes:	Not reported
Enf Action Division:	Riverside County Department of Env Health
Enf Action Program:	HMRRP
Enf Action Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Site Address:	1216 CALIMESA BLVD
Site City:	CALIMESA
Site Zip:	92320
Enf Action Date:	04-07-2015
Enf Action Type:	Notice of Violation (Unified Program)
Enf Action Description:	Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes:	Not reported
Enf Action Division:	Riverside County Department of Env Health
Enf Action Program:	UST
Enf Action Source:	CERS

Site ID:	92989
Site Name:	Arco #83180
Site Address:	1216 CALIMESA BLVD
Site City:	CALIMESA
Site Zip:	92320
Enf Action Date:	04-08-2014
Enf Action Type:	Notice of Violation (Unified Program)
Enf Action Description:	Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes:	Not reported
Enf Action Division:	Riverside County Department of Env Health
Enf Action Program:	UST
Enf Action Source:	CERS

ARCO #83180 (Continued) **S100178801**

Coordinates:

Site ID:	92989
Facility Name:	Arco #83180
Env Int Type Code:	HWG
Program ID:	10327234
Coord Name:	Not reported
Ref Point Type Desc:	Unknown
Latitude:	33.993416
Longitude:	-117.057632

Affiliation:

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Dr
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	91739
Affiliation Phone:	Not reported

Affiliation Type Desc:	Legal Owner
Entity Name:	Gopal Krishna Co., Inc.
Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Drive
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	91739
Affiliation Phone:	(909) 795-6444

Affiliation Type Desc:	UST Property Owner Name
Entity Name:	Gopal Krishna Company Inc.
Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Drive
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	91739
Affiliation Phone:	(909) 795-6444

Affiliation Type Desc:	Document Preparer
Entity Name:	Patrick Kanchy
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Identification Signer
Entity Name:	Bhupat Bhanvadia
Entity Title:	President
Affiliation Address:	Not reported
Affiliation City:	Not reported

ARCO #83180 (Continued) **S100178801**

Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Operator
Entity Name:	Bhupat Bhanvadia
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(909) 795-6444

Affiliation Type Desc:	UST Tank Owner
Entity Name:	Gopal Krishna Company Inc.
Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Drive
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	91739
Affiliation Phone:	(909) 795-6444

Affiliation Type Desc:	CUPA District
Entity Name:	Riverside Cnty Env Health
Entity Title:	Not reported
Affiliation Address:	4065 County Circle Drive, Room 104
Affiliation City:	Riverside
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92503
Affiliation Phone:	(951) 358-5055

Affiliation Type Desc:	Parent Corporation
Entity Name:	Arco #83180
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	UST Permit Applicant
Entity Name:	Bhupat Bhanvadia
Entity Title:	President
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(909) 795-6449

Affiliation Type Desc:	Environmental Contact
Entity Name:	Bhupat V. Bhanvadia

ARCO #83180 (Continued) **S100178801**

Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Drive
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	91739
Affiliation Phone:	Not reported

Affiliation Type Desc:	UST Tank Operator
Entity Name:	Gopal Krishna Company Inc.
Entity Title:	Not reported
Affiliation Address:	14039 San Segundo Drive
Affiliation City:	Rancho Cucamonga
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	91739
Affiliation Phone:	(909) 795-6444

Count: 1 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
YUCAIPA	S107531543		24078 COUNTY LINE RD	92399	CDL

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/19/2019	Source: EPA
Date Data Arrived at EDR: 07/30/2019	Telephone: N/A
Date Made Active in Reports: 09/03/2019	Last EDR Contact: 10/02/2019
Number of Days to Update: 35	Next Scheduled EDR Contact: 01/13/2020
	Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/05/2019	Telephone: 703-603-8704
Date Made Active in Reports: 05/14/2019	Last EDR Contact: 10/04/2019
Number of Days to Update: 39	Next Scheduled EDR Contact: 01/13/2020
	Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA’s Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019	Source: EPA
Date Data Arrived at EDR: 07/30/2019	Telephone: 800-424-9346
Date Made Active in Reports: 09/03/2019	Last EDR Contact: 10/02/2019
Number of Days to Update: 35	Next Scheduled EDR Contact: 01/27/2020
	Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/19/2019	Source: EPA
Date Data Arrived at EDR: 07/30/2019	Telephone: 800-424-9346
Date Made Active in Reports: 09/03/2019	Last EDR Contact: 10/02/2019
Number of Days to Update: 35	Next Scheduled EDR Contact: 01/27/2020
	Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/24/2019	Source: EPA
Date Data Arrived at EDR: 06/26/2019	Telephone: 800-424-9346
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 113	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/24/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/26/2019	Telephone: (415) 495-8895
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 113	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/24/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/26/2019	Telephone: (415) 495-8895
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 113	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/24/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/26/2019	Telephone: (415) 495-8895
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 113	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/24/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/26/2019	Telephone: (415) 495-8895
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 113	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/13/2019	Source: Department of the Navy
Date Data Arrived at EDR: 08/20/2019	Telephone: 843-820-7326
Date Made Active in Reports: 08/26/2019	Last EDR Contact: 08/07/2019
Number of Days to Update: 6	Next Scheduled EDR Contact: 11/25/2019
	Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/19/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/20/2019	Telephone: 703-603-0695
Date Made Active in Reports: 08/26/2019	Last EDR Contact: 08/20/2019
Number of Days to Update: 6	Next Scheduled EDR Contact: 12/09/2019
	Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/19/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/20/2019	Telephone: 703-603-0695
Date Made Active in Reports: 08/26/2019	Last EDR Contact: 08/20/2019
Number of Days to Update: 6	Next Scheduled EDR Contact: 12/09/2019
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 08/12/2019
Date Data Arrived at EDR: 08/13/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 57

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/23/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/16/2018
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 03/07/2019
Date Made Active in Reports: 05/01/2019
Number of Days to Update: 55

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/16/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 42

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 06/10/2019	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/11/2019	Telephone: 866-480-1028
Date Made Active in Reports: 07/24/2019	Last EDR Contact: 09/09/2019
Number of Days to Update: 43	Next Scheduled EDR Contact: 12/23/2019
	Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 06/10/2019	Source: State Water Resources Control Board
Date Data Arrived at EDR: 06/12/2019	Telephone: 916-327-7844
Date Made Active in Reports: 07/23/2019	Last EDR Contact: 09/09/2019
Number of Days to Update: 41	Next Scheduled EDR Contact: 12/23/2019
	Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016	Source: California Environmental Protection Agency
Date Data Arrived at EDR: 07/12/2016	Telephone: 916-327-5092
Date Made Active in Reports: 09/19/2016	Last EDR Contact: 09/12/2019
Number of Days to Update: 69	Next Scheduled EDR Contact: 12/30/2019
	Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/08/2019	Source: EPA Region 9
Date Data Arrived at EDR: 07/29/2019	Telephone: 415-972-3368
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 07/29/2019
Number of Days to Update: 80	Next Scheduled EDR Contact: 11/04/2019
	Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/16/2018	Source: EPA Region 8
Date Data Arrived at EDR: 03/07/2019	Telephone: 303-312-6137
Date Made Active in Reports: 05/01/2019	Last EDR Contact: 08/05/2019
Number of Days to Update: 55	Next Scheduled EDR Contact: 11/04/2019
	Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/01/2019	Source: EPA Region 6
Date Data Arrived at EDR: 07/29/2019	Telephone: 214-665-7591
Date Made Active in Reports: 10/17/2019	Last EDR Contact: 07/29/2019
Number of Days to Update: 80	Next Scheduled EDR Contact: 11/04/2019
	Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/05/2019
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/23/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/02/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC’s costs.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 03/26/2019
Date Data Arrived at EDR: 03/27/2019
Date Made Active in Reports: 04/30/2019
Number of Days to Update: 34

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/02/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 07/29/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 06/28/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 12/04/2018
Date Data Arrived at EDR: 12/06/2018
Date Made Active in Reports: 12/14/2018
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/11/2019
Number of Days to Update: 70

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 64

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 58

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 55

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/03/2017	Telephone: 615-532-8599
Date Made Active in Reports: 04/07/2017	Last EDR Contact: 08/16/2019
Number of Days to Update: 63	Next Scheduled EDR Contact: 11/25/2019
	Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/24/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/26/2019	Telephone: 202-566-1917
Date Made Active in Reports: 09/23/2019	Last EDR Contact: 09/24/2019
Number of Days to Update: 89	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 08/05/2019
Number of Days to Update: 88	Next Scheduled EDR Contact: 11/18/2019
	Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/08/2018	Telephone: 703-308-4044
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 08/09/2019
Number of Days to Update: 73	Next Scheduled EDR Contact: 11/18/2019
	Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016	Source: EPA
Date Data Arrived at EDR: 06/21/2017	Telephone: 202-260-5521
Date Made Active in Reports: 01/05/2018	Last EDR Contact: 09/19/2019
Number of Days to Update: 198	Next Scheduled EDR Contact: 12/30/2019
	Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/23/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/09/2019
Next Scheduled EDR Contact: 11/04/2019
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/15/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 04/01/2019
Date Data Arrived at EDR: 04/30/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 100

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2019
Next Scheduled EDR Contact: 01/19/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/30/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 71

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 08/27/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/10/2019
Date Data Arrived at EDR: 09/10/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 37

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/10/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 07/06/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 57

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 68

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing
list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/15/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner’s agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Annually

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 03/22/2019
Date Made Active in Reports: 04/09/2019
Number of Days to Update: 18

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/24/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 59

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/18/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/22/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 66

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 08/16/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 05/29/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 54

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 65

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/17/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 08/12/2019
Date Data Arrived at EDR: 08/13/2019
Date Made Active in Reports: 10/16/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/13/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/09/2019
Number of Days to Update: 66

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 64

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/21/2019
Number of Days to Update: 7

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/22/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)

Produced water ponds sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)

Sampling point - public sites

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)

Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/11/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/10/2019
Date Data Arrived at EDR: 04/11/2019
Date Made Active in Reports: 06/20/2019
Number of Days to Update: 70

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 26

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 08/05/2019
Date Data Arrived at EDR: 08/07/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 63

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/23/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 08/23/2019
Date Made Active in Reports: 10/22/2019
Number of Days to Update: 60

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/26/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 68

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 06/05/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/11/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/08/2019
Date Data Arrived at EDR: 07/10/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 72

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/19/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

KERN COUNTY:

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/06/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 63

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 08/16/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/15/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/22/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/11/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 71

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 71

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/16/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 01/15/2019
Date Made Active in Reports: 03/07/2019
Number of Days to Update: 51

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills

This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 10/18/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory

A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 09/27/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory

A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 06/25/2019
Next Scheduled EDR Contact: 10/07/2019
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/15/2019
Date Data Arrived at EDR: 07/17/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 19

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/18/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 06/27/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 67

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 05/23/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 53

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/25/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 62

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 09/30/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/21/2019
Date Data Arrived at EDR: 02/22/2019
Date Made Active in Reports: 03/08/2019
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 64

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 08/07/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 63

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/10/2019
Date Data Arrived at EDR: 08/09/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 61

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/10/2019	Source: Health Care Agency
Date Data Arrived at EDR: 08/06/2019	Telephone: 714-834-3446
Date Made Active in Reports: 10/09/2019	Last EDR Contact: 08/05/2019
Number of Days to Update: 64	Next Scheduled EDR Contact: 11/18/2019
	Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/03/2019	Source: Placer County Health and Human Services
Date Data Arrived at EDR: 06/04/2019	Telephone: 530-745-2363
Date Made Active in Reports: 08/12/2019	Last EDR Contact: 08/28/2019
Number of Days to Update: 69	Next Scheduled EDR Contact: 12/16/2019
	Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019	Source: Plumas County Environmental Health
Date Data Arrived at EDR: 04/23/2019	Telephone: 530-283-6355
Date Made Active in Reports: 06/26/2019	Last EDR Contact: 10/17/2019
Number of Days to Update: 64	Next Scheduled EDR Contact: 02/03/2020
	Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/10/2019	Source: Department of Environmental Health
Date Data Arrived at EDR: 07/11/2019	Telephone: 951-358-5055
Date Made Active in Reports: 09/20/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 71	Next Scheduled EDR Contact: 12/30/2019
	Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/10/2019	Source: Department of Environmental Health
Date Data Arrived at EDR: 07/11/2019	Telephone: 951-358-5055
Date Made Active in Reports: 09/23/2019	Last EDR Contact: 09/16/2019
Number of Days to Update: 74	Next Scheduled EDR Contact: 12/30/2019
	Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 55

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/06/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 09/13/2019
Number of Days to Update: 77

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/01/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List

Cupa facility list

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 09/24/2019
Number of Days to Update: 70

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 07/16/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 05/31/2019
Date Made Active in Reports: 07/22/2019
Number of Days to Update: 52

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 65

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/16/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 69

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/11/2019
Next Scheduled EDR Contact: 12/29/2019
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 08/06/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 08/15/2019
Number of Days to Update: 1

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/05/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 08/14/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 10/18/2019
Number of Days to Update: 59

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2019
Date Data Arrived at EDR: 08/02/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 67

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/14/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 47

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 29

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 07/02/2019
Date Made Active in Reports: 09/20/2019
Number of Days to Update: 80

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 07/18/2019
Date Data Arrived at EDR: 07/18/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 70

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/15/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 07/23/2019
Number of Days to Update: 49

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 08/28/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 05/20/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 07/18/2019
Number of Days to Update: 58

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 07/31/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/23/2019
Date Made Active in Reports: 09/26/2019
Number of Days to Update: 65

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 08/12/2019
Date Data Arrived at EDR: 08/14/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 64

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 08/05/2019
Next Scheduled EDR Contact: 11/18/2019
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 05/29/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 09/30/2019
Number of Days to Update: 63

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 06/10/2019
Date Data Arrived at EDR: 06/12/2019
Date Made Active in Reports: 07/24/2019
Number of Days to Update: 42

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 06/26/2019
Date Data Arrived at EDR: 06/28/2019
Date Made Active in Reports: 07/31/2019
Number of Days to Update: 33

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/25/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 07/26/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/08/2019
Number of Days to Update: 69

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/25/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/14/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 83

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/07/2019
Next Scheduled EDR Contact: 11/25/2019
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 51

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 07/29/2019
Next Scheduled EDR Contact: 11/11/2019
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/09/2019
Next Scheduled EDR Contact: 12/07/2020
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/16/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

CALIMESA CHANNEL BASIN STAGE III
WEST COUNTY LINE ROAD/3RD STREET
CALIMESA, CA 92320

TARGET PROPERTY COORDINATES

Latitude (North):	34.003241 - 34˚ 0’ 11.67’’
Longitude (West):	117.048871 - 117˚ 2’ 55.94’’
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	495486.9
UTM Y (Meters):	3762322.0
Elevation:	2479 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5630639 YUCAIPA, CA
Version Date:	2012
South Map:	5640934 EL CASCO, CA
Version Date:	2012

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

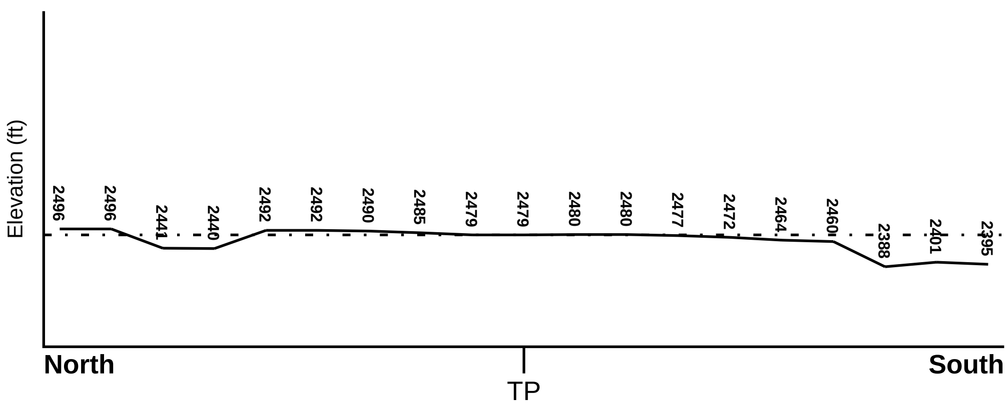
TOPOGRAPHIC INFORMATION

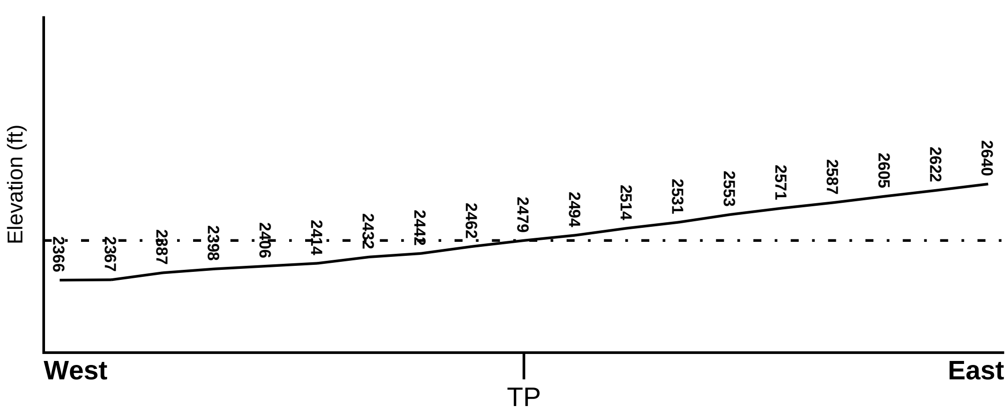
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General West

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 2479 ft.

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06065C0118G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06071C8740H	FEMA FIRM Flood data
0607400000A	FEMA Q3 Flood data
06065C0785G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
D8	1/2 - 1 Mile West	Not Reported
1G	1/2 - 1 Mile West	Not Reported

For additional site information, refer to Physical Setting Source Map Findings.

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

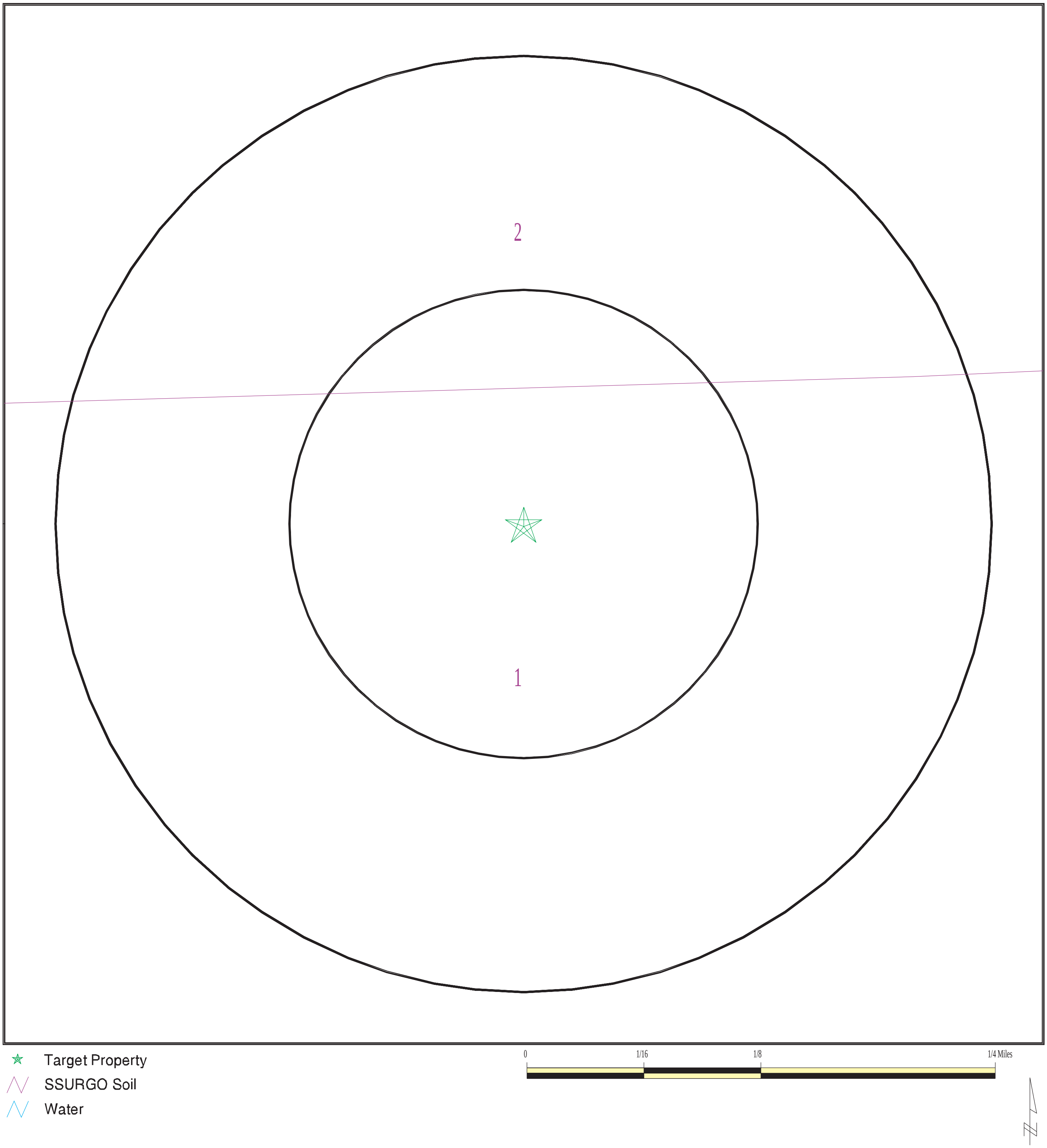
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5842101.2s



SITE NAME:	Calimesa Channel Basin Stage III	CLIENT:	LOR Geotechnical Group, Inc.
ADDRESS:	West County Line Road/3rd Street Calimesa CA 92320	CONTACT:	Mathew L. Hunt
		INQUIRY #:	5842101.2s
LAT/LONG:	34.003241 / 117.048871	DATE:	October 24, 2019 12:39 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: RAMONA

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**		**Soil Reaction (pH)**
1	0 inches	14 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
2	14 inches	22 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6
3	22 inches	68 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	68 inches	74 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 2

Soil Component Name: RAMONA

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.6
2	22 inches	31 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		Soil Reaction (pH)
3	31 inches	53 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.6
4	53 inches	59 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 6.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B3	USGS40000139765	1/2 - 1 Mile NNW
C5	USGS40000139618	1/2 - 1 Mile SW
D9	USGS40000139722	1/2 - 1 Mile West
E10	USGS40000139694	1/2 - 1 Mile WSW
F11	USGS40000139609	1/2 - 1 Mile SSW
H22	USGS40000139782	1/2 - 1 Mile NE
H23	USGS40000139781	1/2 - 1 Mile NE
H24	USGS40000139784	1/2 - 1 Mile NE
H25	USGS40000139783	1/2 - 1 Mile NE
26	USGS40000139753	1/2 - 1 Mile WNW
27	USGS40000139712	1/2 - 1 Mile West

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

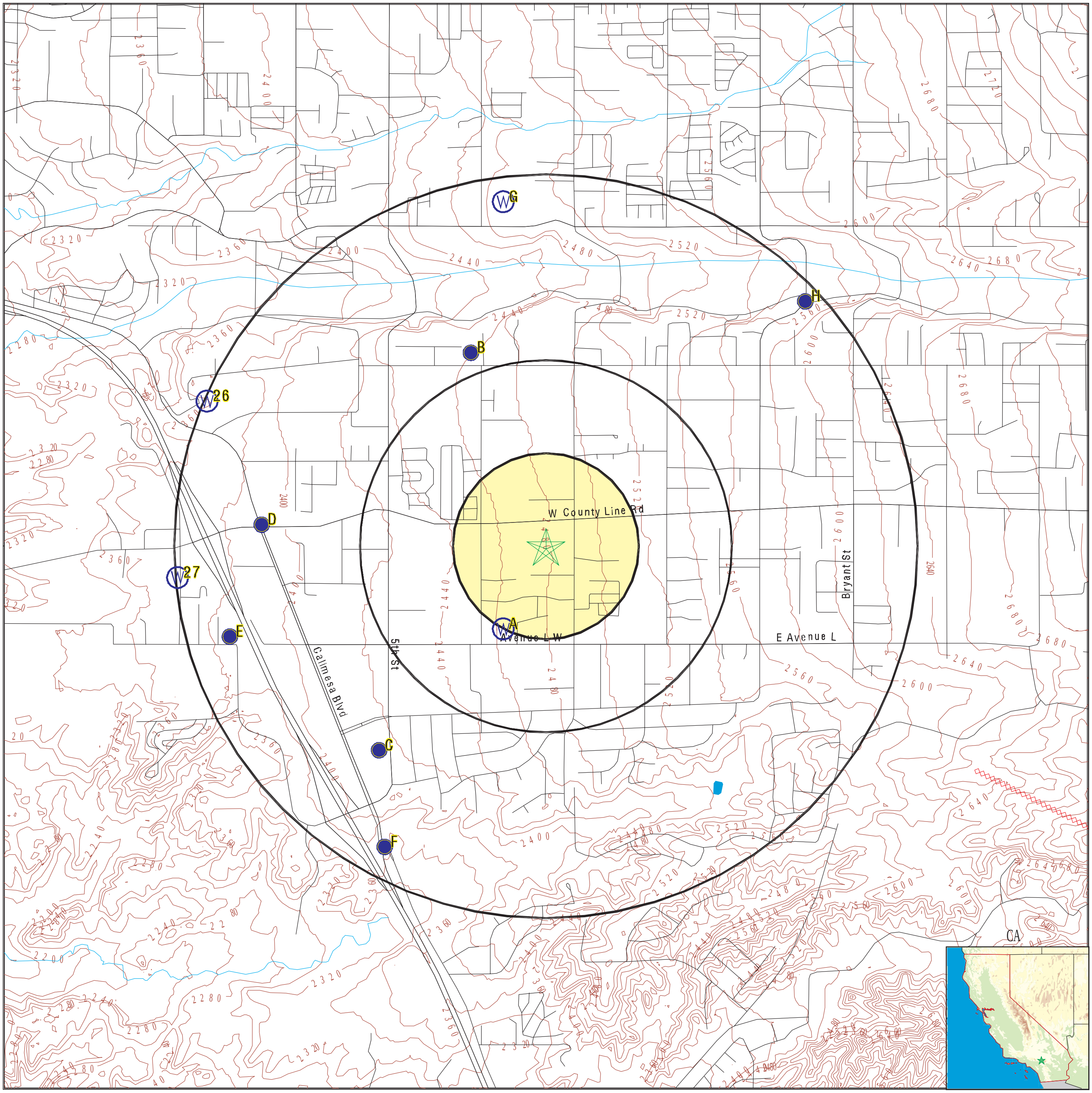
MAP ID	WELL ID	LOCATION FROM TP
D7	CA3310017	1/2 - 1 Mile West

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	2412	1/4 - 1/2 Mile SSW
A2	2416	1/4 - 1/2 Mile SSW
B4	CADWR8000006374	1/2 - 1 Mile NNW
C6	CADWR8000006338	1/2 - 1 Mile SW
E12	CADWR8000006354	1/2 - 1 Mile WSW
G13	2405	1/2 - 1 Mile North
G14	2404	1/2 - 1 Mile North
G15	2409	1/2 - 1 Mile North
G16	2406	1/2 - 1 Mile North
F17	CADWR8000006333	1/2 - 1 Mile SSW
H18	CADWR8000006376	1/2 - 1 Mile NE
H19	CADWR8000006377	1/2 - 1 Mile NE
H20	CADWR8000006378	1/2 - 1 Mile NE
H21	CADWR8000006375	1/2 - 1 Mile NE

PHYSICAL SETTING SOURCE MAP - 5842101.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME:	Calimesa Channel Basin Stage III	CLIENT:	LOR Geotechnical Group, Inc.
ADDRESS:	West County Line Road/3rd Street	CONTACT:	Mathew L. Hunt
	Calimesa CA 92320	INQUIRY #:	5842101.2s
LAT/LONG:	34.003241 / 117.048871	DATE:	October 24, 2019 12:39 pm

Map ID Direction Distance Elevation	Database	EDR ID Number
A1 **SSW** **1/4 - 1/2 Mile** **Lower**	**CA WELLS**	**2412**

Seq:	2412	Prim sta c:	02S/02W-14B01 S
Frds no:	3310017011	County:	33
District:	14	User id:	WAT
System no:	3310017	Water type:	G
Source nam:	WELL 14 - ABANDONED	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340000.0	Longitude:	1170300.0
Precision:	8	Status:	AB
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3310017	System nam:	South Mesa Wc
Hqname:	Not Reported	Address:	P O BOX 458
City:	CALIMESA	State:	CA
Zip:	92320	Zip ext:	Not Reported
Pop serv:	7200	Connection:	2539
Area serve:	SOUTH MESA-CALIMESA		

A2 **SSW** **1/4 - 1/2 Mile** **Lower**	**CA WELLS**	**2416**

Seq:	2416	Prim sta c:	02S/02W-14J02 S
Frds no:	3310017001	County:	33
District:	14	User id:	WAT
System no:	3310017	Water type:	G
Source nam:	WELL 01 - ABANDONED	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340000.0	Longitude:	1170300.0
Precision:	8	Status:	AB
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3310017	System nam:	South Mesa Wc
Hqname:	Not Reported	Address:	P O BOX 458
City:	CALIMESA	State:	CA
Zip:	92320	Zip ext:	Not Reported
Pop serv:	7200	Connection:	2539
Area serve:	SOUTH MESA-CALIMESA		

B3 **NNW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000139765**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W12M001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

Ground water levels,Number of Measurements:	186	Level reading date:	2002-11-04
Feet below surface:	Not Reported	Feet to sea level:	Not Reported
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	2002-04-22	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	2001-11-05	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	2001-04-09	Feet below surface:	321.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-24	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	2000-04-25	Feet below surface:	323.9
Feet to sea level:	Not Reported		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	1999-10-25	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	1998-11-09	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	1998-11-01	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	An obstruction was encountered in the well above the water surface (no water level recorded).		
Level reading date:	1998-06-02	Feet below surface:	322.5
Feet to sea level:	Not Reported		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	1998-06-01	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-11-10	Feet below surface:	315
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-05-09	Feet below surface:	307.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-07	Feet below surface:	308
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-11-12	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1991-08-14	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-05-01	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-02-07	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-11-01	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-08-09	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-12-01	Feet below surface:	278
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-07-31	Feet below surface:	269
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-08-24	Feet below surface:	269
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-06-17	Feet below surface:	270
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-05-15	Feet below surface:	270
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-06-16	Feet below surface:	264
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-12-16	Feet below surface:	272
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-06-24	Feet below surface:	273
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-02-10	Feet below surface:	261
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-12-20	Feet below surface:	276
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-08-14	Feet below surface:	269
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-12-18	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-06-07	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-04-03	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-28	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-15	Feet below surface:	299
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1983-04-22	Feet below surface:	266
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-08	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-07	Feet below surface:	292
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10-25	Feet below surface:	301
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-08-23	Feet below surface:	300
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-07-19	Feet below surface:	299
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-06-09	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-12-16	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-11-24	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10-27	Feet below surface:	309
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-09-16	Feet below surface:	307
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-08-19	Feet below surface:	307
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-07-15	Feet below surface:	307
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-06-24	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-05-15	Feet below surface:	309
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-15	Feet below surface:	309
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-02-15	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-01-15	Feet below surface:	307
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-12-15	Feet below surface:	307
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1980-09-15	Feet below surface:	313
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-08-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-07-15	Feet below surface:	312
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-06-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-04-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-03-15	Feet below surface:	301
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-02-15	Feet below surface:	313
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-01-15	Feet below surface:	315
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-12-15	Feet below surface:	316
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-11-15	Feet below surface:	316
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-15	Feet below surface:	317
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-09-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-08-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-07-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-06-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-05-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-04-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-03-15	Feet below surface:	312
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-02-15	Feet below surface:	311
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-01-15	Feet below surface:	314
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1978-12-15	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-11-15	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10-15	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-09-15	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-08-15	Feet below surface:	320
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-03-28	Feet below surface:	322.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-02-28	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-11-28	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10-27	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-09-22	Feet below surface:	324
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-08-19	Feet below surface:	318
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-06-14	Feet below surface:	320.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-23	Feet below surface:	321
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-04-19	Feet below surface:	322
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-03-14	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-02-14	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-01-18	Feet below surface:	324.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-12-13	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-12	Feet below surface:	325.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-10-18	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-09-21	Feet below surface:	326.5
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1976-08-18	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-07-12	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-06-08	Feet below surface:	322.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-05-07	Feet below surface:	322
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-04-13	Feet below surface:	322.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03-15	Feet below surface:	323.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-01-15	Feet below surface:	326.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-12-15	Feet below surface:	327
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-11-10	Feet below surface:	327
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10-13	Feet below surface:	327
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-09-11	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-08-13	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-07-16	Feet below surface:	323.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-06-09	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-12	Feet below surface:	323
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-04-10	Feet below surface:	324
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03-11	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-02-13	Feet below surface:	326
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-01-13	Feet below surface:	327
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-12-16	Feet below surface:	328
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-11-14	Feet below surface:	329
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1974-10-10	Feet below surface:	319
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-09-17	Feet below surface:	320
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-08-12	Feet below surface:	320
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-07-16	Feet below surface:	318
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-06-12	Feet below surface:	315
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-08	Feet below surface:	325
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-04-05	Feet below surface:	327.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03-06	Feet below surface:	328.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-02-07	Feet below surface:	330
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-01-10	Feet below surface:	331.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-06	Feet below surface:	332.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-07	Feet below surface:	328.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-04-06	Feet below surface:	329
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-12	Feet below surface:	330
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-27	Feet below surface:	332
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-12-07	Feet below surface:	333
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-08	Feet below surface:	336
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-01-05	Feet below surface:	332
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-08-09	Feet below surface:	298
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-30	Feet below surface:	306.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-07-26	Feet below surface:	265
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1949-04-06	Feet below surface:	254.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-10-06	Feet below surface:	258.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-04-15	Feet below surface:	248.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-04-14	Feet below surface:	248.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-12-09	Feet below surface:	257.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-12-05	Feet below surface:	257.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-04-05	Feet below surface:	248
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-04-03	Feet below surface:	239.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-04-05	Feet below surface:	235.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-04-01	Feet below surface:	235.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-10-12	Feet below surface:	239.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-10-03	Feet below surface:	227.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-04-03	Feet below surface:	229
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-10-04	Feet below surface:	237.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-03	Feet below surface:	227.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-10-04	Feet below surface:	232.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-04-04	Feet below surface:	227.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-10-04	Feet below surface:	232.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-02	Feet below surface:	228.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-04	Feet below surface:	235
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-04-03	Feet below surface:	226.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1936-04-04	Feet below surface:	224
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-10-10	Feet below surface:	236.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-04-10	Feet below surface:	224.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1934-04-06	Feet below surface:	222
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1933-04-12	Feet below surface:	222.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-10-10	Feet below surface:	233.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-04-13	Feet below surface:	221
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-03-31	Feet below surface:	221.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-10-12	Feet below surface:	228.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-04-04	Feet below surface:	224.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-10-04	Feet below surface:	240.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-04-30	Feet below surface:	219.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-12-06	Feet below surface:	224.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-04-19	Feet below surface:	216.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-03-11	Feet below surface:	217.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-01-07	Feet below surface:	220.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-12-06	Feet below surface:	222.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-11-02	Feet below surface:	224.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-10-06	Feet below surface:	227.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-01-28	Feet below surface:	214.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-10-07	Feet below surface:	220.6
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1927-05-01	Feet below surface:	206.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-01-31	Feet below surface:	209
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1926-12-06	Feet below surface:	211.8
Feet to sea level:	Not Reported	Note:	Not Reported

B4
NNW
1/2 - 1 Mile
Lower

CA WELLS **CADWR8000006374**

State Well #:	02S02W12M001S	Station ID:	2658
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

C5
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40000139618**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W14J002S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

Ground water levels,Number of Measurements:	28	Level reading date:	2004-10-25
Feet below surface:	161.5	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-10-25	Feet below surface:	161.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-20	Feet below surface:	160.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-20	Feet below surface:	160.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-17	Feet below surface:	160.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-17	Feet below surface:	160.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-04-28	Feet below surface:	159.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2003-04-28	Feet below surface:	159.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-04	Feet below surface:	160.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-04	Feet below surface:	160.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-22	Feet below surface:	158.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-22	Feet below surface:	158.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-05	Feet below surface:	158.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-05	Feet below surface:	158.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-14	Feet below surface:	156.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-14	Feet below surface:	156.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-23	Feet below surface:	157.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-23	Feet below surface:	157.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-25	Feet below surface:	156.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-25	Feet below surface:	156.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-25	Feet below surface:	156.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-25	Feet below surface:	156.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-26	Feet below surface:	155.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-26	Feet below surface:	155.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-02	Feet below surface:	157.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-02	Feet below surface:	157.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-11	Feet below surface:	218.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-11	Feet below surface:	218.52
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
C6 **SW** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADWR8000006338**

State Well #:	02S02W14J002S	Station ID:	26176
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

D7 **West** **1/2 - 1 Mile** **Lower**	**FRDS PWS**	**CA3310017**

Epa region:	09	State:	CA
Pwsid:	CA3310017	Pwsname:	SOUTH MESA WC
Cityserved:	Not Reported	Stateserved:	CA
Zipserved:	Not Reported	Fipscounty:	06065
Status:	Active	Retpopsrvd:	9851
Pwssvcconn:	2912	Psource longname:	Groundwater
Pwstype:	CWS	Owner:	Private
Contact:	ARMSTRONG, DAVID	Contactorgname:	ARMSTRONG, DAVID
Contactphone:	909-795-2401	Contactaddress1:	P.O. BOX 458
Contactaddress2:	391 WEST AVE. L	Contactcity:	CALIMESA
Contactstate:	CA	Contactzip:	92320
Pwsactivitycode:	A		

Pwsid:	CA3310017	Facid:	45063
Facname:	WELL 04 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45064
Facname:	WELL 05 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45065
Facname:	WELL 07 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45066
Facname:	WELL 09 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45068
Facname:	WELL 11 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45069
Facname:	WELL 12 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	45070
Facname:	WELL 16 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

Pwsid:	CA3310017	Facid:	57158
Facname:	WELL 17 - CL	Factype:	Treatment_plant
Facactivitycode:	A	Trtobjective:	disinfection
Trtprocess:	hypochlorination, post	Factypecode:	TP

PWS ID:	CA3310017	PWS name:	SOUTH MESA WC
Address:	Not Reported	Care of:	Not Reported
City:	CALIMESA	State:	CA
Zip:	92320	Owner:	SOUTH MESA WC
Source code:	Ground water	Population:	7929

PWS ID:	CA3310017	PWS type:	Not Reported
PWS name:	Not Reported	PWS address:	Not Reported
PWS city:	Not Reported	PWS state:	Not Reported
PWS zip:	Not Reported	PWS name:	South Mesa WC
PWS type code:	C	Retail population served:	9018
Contact:	David McClellan	Contact address:	P.O. Box 458
Contact address:	391 West Ave. L	Contact city:	Calimesa
Contact state:	CA	Contact zip:	92320
Contact telephone:	9097952401		

PWS ID:	CA3310017	Activity status:	Active
Date system activated:	7706	Date system deactivated:	Not Reported
Retail population:	00007200	System name:	SOUTH MESA WC
System address:	Not Reported	System address:	P O BOX 458
System city:	CALIMESA	System state:	CA
System zip:	92320		

County FIPS:	Not Reported	City served:	SOUTH MESA-CALI

County FIPS:	065	City served:	SOUTH MESA-CALI

Population served:	5,001 - 10,000 Persons	Treatment:	Treated

Latitude:	340014	Longitude:	1170339

Violation id:	1020004	Orig code:	S
State:	CA	Violation Year:	2010
Contamination code:	1025	Contamination Name:	Fluoride
Violation code:	04		
Violation name:	Monitoring, Check/Repeat/Confirmation		
Rule code:	333	Rule name:	Other IOC
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	04/01/2010
Cmp edt:	03/31/2011		

Violation id:	1020005	Orig code:	S
State:	CA	Violation Year:	2013
Contamination code:	5000	Contamination Name:	Lead and Copper Rule
Violation code:	52	Violation name:	Follow-up Or Routine LCR Tap M/R
Rule code:	350	Rule name:	LCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	10/01/2013
Cmp edt:	Not Reported		

Violation id:	920002	Orig code:	S
State:	CA	Violation Year:	2009

Contamination code:	2950	Contamination Name:	TTHM
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2009
Cmp edt:	12/31/2009		

Violation id:	920003	Orig code:	S
State:	CA	Violation Year:	2009
Contamination code:	2456	Contamination Name:	Total Haloacetic Acids (HAA5)
Violation code:	27	Violation name:	Monitoring and Reporting (DBP)
Rule code:	210	Rule name:	St1 DBP
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	01/01/2009
Cmp edt:	12/31/2009		

Violation id:	94V0001	Orig code:	F
State:	CA	Violation Year:	1993
Contamination code:	5000	Contamination Name:	Lead and Copper Rule
Violation code:	51	Violation name:	Initial Tap Sampling for Pb and Cu
Rule code:	350	Rule name:	LCR
Violation measur:	0	Unit of measure:	Not Reported
State mcl:	0	Cmp bdt:	06/30/1993
Cmp edt:	03/01/2000		

PWS currently has or had major violation(s) or enforcement:Yes

Violation ID:	94V0001	Violation source ID:	Not Reported
PWS telephone:	Not Reported	Contaminant:	LEAD & COPPER RULE
Violation type:	Initial Tap Sampling for Pb and Cu		
Violation start date:	063093	Violation end date:	122993
Violation period (months):	006	Violation awareness date:	Not Reported
Major violator:	Not Reported	Maximum contaminant level:	Not Reported
Number of required samples:	Not Reported	Number of samples taken:	Not Reported
Analysis method:	Not Reported	Analysis result:	Not Reported

PWS currently has or had major violation(s) or enforcement:Yes

Violation ID:	94V0002	Violation source ID:	Not Reported
PWS telephone:	Not Reported	Contaminant:	LEAD & COPPER RULE
Violation type:	Initial Tap Sampling for Pb and Cu		
Violation start date:	123193	Violation end date:	063094
Violation period (months):	006	Violation awareness date:	Not Reported
Major violator:	Not Reported	Maximum contaminant level:	Not Reported
Number of required samples:	Not Reported	Number of samples taken:	Not Reported
Analysis method:	Not Reported	Analysis result:	Not Reported

System Name:	SOUTH MESA WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	1993-06-30
Compliance End:	2000-03-01	Violation ID:	94V0001
Enforcement Date:	2000-03-01	Enforcement Action:	EOX

System Name:	South Mesa WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	6/30/1993 0:00:00
Compliance End:	3/1/2000 0:00:00	Violation ID:	94V0001
Enforcement Date:	3/1/2000 0:00:00	Enforcement Action:	EOX

System Name:	SOUTH MESA WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	1993-06-30
Compliance End:	2015-12-31	Violation ID:	94V0001
Enforcement Date:	Not Reported	Enforcement Action:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

System Name:	South Mesa WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	06/30/93
Compliance End:	03/01/00	Violation ID:	94V0001
Enforcement Date:	03/01/00	Enforcement Action:	EOX

System Name:	SOUTH MESA WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	1993-12-31
Compliance End:	2000-03-01	Violation ID:	94V0002
Enforcement Date:	2000-03-01	Enforcement Action:	EOX

System Name:	South Mesa WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	12/31/93
Compliance End:	03/01/00	Violation ID:	94V0002
Enforcement Date:	03/01/00	Enforcement Action:	EOX

System Name:	South Mesa WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	12/31/1993 0:00:00
Compliance End:	3/1/2000 0:00:00	Violation ID:	94V0002
Enforcement Date:	3/1/2000 0:00:00	Enforcement Action:	EOX

System Name:	SOUTH MESA WC	Violation Type:	51
Contaminant:	5000	Compliance Begin:	1993-12-31
Compliance End:	2015-12-31	Violation ID:	94V0002
Enforcement Date:	Not Reported	Enforcement Action:	Not Reported

Violation ID:	1020004	Orig Code:	S
Enforcemnt FY:	2011	Enforcement Action:	01/11/2011
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	1020005	Orig Code:	S
Enforcemnt FY:	2014	Enforcement Action:	10/23/2013
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	1020005	Orig Code:	S
Enforcemnt FY:	2014	Enforcement Action:	10/30/2013
Enforcement Detail:	St Formal NOV issued	Enforcement Category:	Informal

Violation ID:	920002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	02/08/2010
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	920002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	01/11/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	920003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	02/08/2010
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		

Violation ID:	920003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	01/11/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	94V0001	Orig Code:	F
Enforcemnt FY:	2000	Enforcement Action:	03/01/2000
Enforcement Detail:	Fed Compliance achieved	Enforcement Category:	Resolving

PWS name:	South Mesa WC	Population served:	9018
PWS type code:	C	Violation ID:	94V0001

Contaminant:	LEAD & COPPER RULE	Violation type:	Initial Tap Sampling for Pb and Cu
Compliance start date:	6/30/1993 0:00:00	Compliance end date:	3/1/2000 0:00:00
Enforcement date:	3/1/2000 0:00:00	Enforcement action:	Fed Compliance Achieved
Violation measurement:	0		

D8
West
1/2 - 1 Mile
Lower

AQUIFLOW 66387

Site ID:	083302496T
Groundwater Flow:	Not Reported
Shallow Water Depth:	168’
Deep Water Depth:	322’
Average Water Depth:	Not Reported
Date:	06/02/1994

D9
West
1/2 - 1 Mile
Lower

FED USGS USGS40000139722

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W14C001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19200400	Well Depth:	363
Well Depth Units:	ft	Well Hole Depth:	443
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	302	Level reading date:	1999-04-01
Feet below surface:	262	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	1999-04-01	Feet below surface:	262
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-11-01	Feet below surface:	231.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-11-01	Feet below surface:	231.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-01	Feet below surface:	231.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-01	Feet below surface:	231.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-11-01	Feet below surface:	220
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-11-01	Feet below surface:	220
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-05-02	Feet below surface:	247
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-05-02	Feet below surface:	247
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1993-10-07	Feet below surface:	247
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-07	Feet below surface:	247
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-11-11	Feet below surface:	242
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-11-11	Feet below surface:	242
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-08-14	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-08-14	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-05-01	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-05-01	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-11-01	Feet below surface:	235
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-11-01	Feet below surface:	235
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-08-09	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-08-09	Feet below surface:	238
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-12-01	Feet below surface:	210
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-12-01	Feet below surface:	210
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-07-31	Feet below surface:	235
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-07-31	Feet below surface:	235
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-05-09	Feet below surface:	230
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-05-09	Feet below surface:	230
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-08-24	Feet below surface:	230
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-08-24	Feet below surface:	230
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-06-17	Feet below surface:	228
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1988-06-17	Feet below surface:	228
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-05-15	Feet below surface:	223
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-05-15	Feet below surface:	223
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-06-16	Feet below surface:	225
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-06-16	Feet below surface:	225
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-12-16	Feet below surface:	234
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-12-16	Feet below surface:	234
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-02-10	Feet below surface:	246
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-02-10	Feet below surface:	246
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-12-20	Feet below surface:	240
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-12-20	Feet below surface:	240
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-06-25	Feet below surface:	265
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-06-25	Feet below surface:	265
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-28	Feet below surface:	258
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-12-28	Feet below surface:	258
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-22	Feet below surface:	245
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-22	Feet below surface:	245
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-08	Feet below surface:	262
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-08	Feet below surface:	262
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-07	Feet below surface:	245
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-12-07	Feet below surface:	245
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1982-10-25	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-10-25	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-08-23	Feet below surface:	288
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-08-23	Feet below surface:	288
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-07-20	Feet below surface:	255
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-07-20	Feet below surface:	255
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-08-20	Feet below surface:	304
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-08-20	Feet below surface:	304
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-05-01	Feet below surface:	300
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-05-01	Feet below surface:	300
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-15	Feet below surface:	276
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-15	Feet below surface:	276
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-01	Feet below surface:	276
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-01	Feet below surface:	276
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-15	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-15	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-02	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-02	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-02-15	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-02-15	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-01-02	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1981-01-02	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-12-01	Feet below surface:	308
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-12-01	Feet below surface:	308
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-15	Feet below surface:	310
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-13	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-13	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-06-17	Feet below surface:	304
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-06-17	Feet below surface:	304
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-04-15	Feet below surface:	278
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-04-15	Feet below surface:	278
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-12-15	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-12-15	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-18	Feet below surface:	308
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-18	Feet below surface:	308
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-07-15	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-07-15	Feet below surface:	306
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-04-01	Feet below surface:	242
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-04-01	Feet below surface:	242
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-01-01	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-01-01	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1978-10-15	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10-15	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-23	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-23	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-04-19	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-04-19	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-08	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-08	Feet below surface:	277
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-04-05	Feet below surface:	288.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-04-05	Feet below surface:	288.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03-06	Feet below surface:	293.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03-06	Feet below surface:	293.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-02-07	Feet below surface:	286.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-02-07	Feet below surface:	286.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-01-10	Feet below surface:	287.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-01-10	Feet below surface:	287.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-06	Feet below surface:	288.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-06	Feet below surface:	288.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-07	Feet below surface:	290
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-07	Feet below surface:	290
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-04-06	Feet below surface:	270
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1973-04-06	Feet below surface:	270
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-12	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-12	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-27	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-27	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-04-07	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-04-07	Feet below surface:	282
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-11-05	Feet below surface:	285
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-11-05	Feet below surface:	285
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-02	Feet below surface:	281
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-02	Feet below surface:	281
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-08	Feet below surface:	287
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-08	Feet below surface:	287
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-11-27	Feet below surface:	287
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-11-27	Feet below surface:	287
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-10	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-10	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-01-05	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-01-05	Feet below surface:	286
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-04-10	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-04-10	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1965-12-15	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-12-15	Feet below surface:	284
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-04-01	Feet below surface:	288
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-04-01	Feet below surface:	288
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-11-25	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-11-25	Feet below surface:	283
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-08	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-08	Feet below surface:	280
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-11-29	Feet below surface:	285
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-11-29	Feet below surface:	285
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-04-18	Feet below surface:	273.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-04-18	Feet below surface:	273.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-03-31	Feet below surface:	242.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-03-31	Feet below surface:	242.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-08-09	Feet below surface:	263
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-08-09	Feet below surface:	263
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-30	Feet below surface:	243.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-30	Feet below surface:	243.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-17	Feet below surface:	234.80
Feet to sea level:	Not Reported		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	1955-03-17	Feet below surface:	234.80
Feet to sea level:	Not Reported		
Note:	A nearby site that taps the same aquifer was being pumped.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1954-04-08	Feet below surface:	227.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-04-08	Feet below surface:	227.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-04-20	Feet below surface:	223.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-04-20	Feet below surface:	223.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-04-11	Feet below surface:	223.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-04-11	Feet below surface:	223.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-11-29	Feet below surface:	230.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-11-29	Feet below surface:	230.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-11-26	Feet below surface:	230.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-11-26	Feet below surface:	230.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-04-11	Feet below surface:	216
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-04-11	Feet below surface:	216
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-04-05	Feet below surface:	216
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-04-05	Feet below surface:	216
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-12	Feet below surface:	227
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-12	Feet below surface:	227
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-06	Feet below surface:	226.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-06	Feet below surface:	226.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-04-08	Feet below surface:	211.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-04-08	Feet below surface:	211.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-11-03	Feet below surface:	226.4
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1950-11-03	Feet below surface:	226.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-10-03	Feet below surface:	226.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-10-03	Feet below surface:	226.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-04-04	Feet below surface:	300
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-04-04	Feet below surface:	300
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-03-29	Feet below surface:	200.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-03-29	Feet below surface:	200.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-10-03	Feet below surface:	224.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-10-03	Feet below surface:	224.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-10-01	Feet below surface:	224.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-10-01	Feet below surface:	224.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-04-06	Feet below surface:	200
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-04-06	Feet below surface:	200
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-10-12	Feet below surface:	222
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-10-12	Feet below surface:	222
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-12-05	Feet below surface:	210.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-12-05	Feet below surface:	210.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-04-05	Feet below surface:	190
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-04-05	Feet below surface:	190
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1946-04-03	Feet below surface:	184.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1946-04-03	Feet below surface:	184.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1945-11-05	Feet below surface:	198.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-11-05	Feet below surface:	198.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-04-03	Feet below surface:	178.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-04-03	Feet below surface:	178.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-11-09	Feet below surface:	194.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-11-09	Feet below surface:	194.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-04-05	Feet below surface:	172.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-04-05	Feet below surface:	172.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-04-01	Feet below surface:	168.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-04-01	Feet below surface:	168.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-04-04	Feet below surface:	162.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-04-04	Feet below surface:	162.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-10-03	Feet below surface:	175.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-10-03	Feet below surface:	175.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-04-03	Feet below surface:	165.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-04-03	Feet below surface:	165.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-03	Feet below surface:	162.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-03	Feet below surface:	162.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-10-04	Feet below surface:	170.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-10-04	Feet below surface:	170.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-04-04	Feet below surface:	162.2
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1939-04-04	Feet below surface:	162.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-02	Feet below surface:	161.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-02	Feet below surface:	161.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-12	Feet below surface:	170.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-12	Feet below surface:	170.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-04	Feet below surface:	172.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-04	Feet below surface:	172.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-04-03	Feet below surface:	159.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-04-03	Feet below surface:	159.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-10-12	Feet below surface:	169.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-10-12	Feet below surface:	169.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-04-01	Feet below surface:	157.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-04-01	Feet below surface:	157.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-10-10	Feet below surface:	165.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-10-10	Feet below surface:	165.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-04-10	Feet below surface:	158
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-04-10	Feet below surface:	158
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1934-10-13	Feet below surface:	169.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1934-10-13	Feet below surface:	169.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1933-11-01	Feet below surface:	162.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1933-11-01	Feet below surface:	162.8
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1933-04-12	Feet below surface:	156
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1933-04-12	Feet below surface:	156
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-10-10	Feet below surface:	167
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-10-10	Feet below surface:	167
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-04-13	Feet below surface:	154.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-04-13	Feet below surface:	154.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-03-09	Feet below surface:	156.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-03-09	Feet below surface:	156.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-02-10	Feet below surface:	157
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-02-10	Feet below surface:	157
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-11-09	Feet below surface:	162
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-11-09	Feet below surface:	162
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-05-07	Feet below surface:	157
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-05-07	Feet below surface:	157
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-04-04	Feet below surface:	155.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-04-04	Feet below surface:	155.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-03-06	Feet below surface:	156.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-03-06	Feet below surface:	156.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-02-07	Feet below surface:	157.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-02-07	Feet below surface:	157.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-01-09	Feet below surface:	159.2
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1931-01-09	Feet below surface:	159.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-04-30	Feet below surface:	153.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-04-30	Feet below surface:	153.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-04-09	Feet below surface:	153.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-04-09	Feet below surface:	153.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-02-18	Feet below surface:	156.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-02-18	Feet below surface:	156.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-12-01	Feet below surface:	161
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-12-01	Feet below surface:	161
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-04-19	Feet below surface:	151
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-04-19	Feet below surface:	151
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-02-08	Feet below surface:	154.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-02-08	Feet below surface:	154.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-01-07	Feet below surface:	156.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929-01-07	Feet below surface:	156.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-12-06	Feet below surface:	159.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-12-06	Feet below surface:	159.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-11-02	Feet below surface:	164.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-11-02	Feet below surface:	164.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-10-06	Feet below surface:	173.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-10-06	Feet below surface:	173.2
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1928-09-29	Feet below surface:	178.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-09-29	Feet below surface:	178.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-04-25	Feet below surface:	147
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-04-25	Feet below surface:	147
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-02-03	Feet below surface:	148.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-02-03	Feet below surface:	148.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-12-31	Feet below surface:	151.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-12-31	Feet below surface:	151.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-10-07	Feet below surface:	164
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-10-07	Feet below surface:	164
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-05-01	Feet below surface:	140.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-05-01	Feet below surface:	140.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-04-02	Feet below surface:	141.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-04-02	Feet below surface:	141.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-03-01	Feet below surface:	143
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-03-01	Feet below surface:	143
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-01-31	Feet below surface:	144.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1927-01-31	Feet below surface:	144.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1926-12-03	Feet below surface:	147.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1926-12-03	Feet below surface:	147.6
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID Direction Distance Elevation	Database	EDR ID Number
E10 **WSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000139694**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W14F001S	Type:	Well
Description:	ROCKWELL GPS FOR LAT/LONG., NAD27		
HUC:	18070203	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	California Coastal Basin aquifers
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	1927	Well Depth:	0
Well Depth Units:	ft	Well Hole Depth:	360
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	4	Level reading date:	1999-10-25
Feet below surface:	Not Reported	Feet to sea level:	Not Reported
Note:	The well was destroyed (no water level is recorded).		
Level reading date:	1999-10-25	Feet below surface:	Not Reported
Feet to sea level:	Not Reported		
Note:	The well was destroyed (no water level is recorded).		
Level reading date:	1998-06-02	Feet below surface:	263.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-02	Feet below surface:	263.5
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID	Database	EDR ID Number
F11 **SSW** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000139609**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W14R001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	500
Well Depth Units:	ft	Well Hole Depth:	500
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	43	Level reading date:	2004-10-25
Feet below surface:	103.7	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-04-20	Feet below surface:	101.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-17	Feet below surface:	101.0
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2003-04-28	Feet below surface:	99.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-04	Feet below surface:	102.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-22	Feet below surface:	99.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-05	Feet below surface:	101.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-14	Feet below surface:	96.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-23	Feet below surface:	97.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-24	Feet below surface:	96.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-25	Feet below surface:	98.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-26	Feet below surface:	95.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-01	Feet below surface:	90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-11-09	Feet below surface:	98.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-11-01	Feet below surface:	98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-06-01	Feet below surface:	96.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-17	Feet below surface:	109
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-11-12	Feet below surface:	11.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-08-15	Feet below surface:	112
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-05-01	Feet below surface:	112
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-02-08	Feet below surface:	112
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-11-01	Feet below surface:	112
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-08-01	Feet below surface:	112
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-13	Feet below surface:	116
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1980-05-13	Feet below surface:	171
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-18	Feet below surface:	123
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-04-01	Feet below surface:	123
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-11-01	Feet below surface:	127
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-11-28	Feet below surface:	132
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-10-18	Feet below surface:	138
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-04-13	Feet below surface:	134
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-11-10	Feet below surface:	138
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-12	Feet below surface:	133
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-12-16	Feet below surface:	138
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-08	Feet below surface:	137.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-06	Feet below surface:	145.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-04-06	Feet below surface:	141
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-12	Feet below surface:	158
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-27	Feet below surface:	152
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-12-07	Feet below surface:	152
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-04-07	Feet below surface:	154
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-11-05	Feet below surface:	163
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-02	Feet below surface:	159.5
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E12
WSW
1/2 - 1 Mile
Lower

CA WELLS **CADWR8000006354**

State Well #:	02S02W14F001S	Station ID:	2660
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

G13
North
1/2 - 1 Mile
Higher

CA WELLS **2405**

Seq:	2405	Prim sta c:	02S/02W-11B01 S
Frds no:	3610055006	County:	36
District:	13	User id:	TAN
System no:	3610055	Water type:	G
Source nam:	WELL 02	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340100.0	Longitude:	1170300.0
Precision:	8	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3610055	System nam:	Yucaipa Valley Wd Id-A&2
Hqname:	YUCAIPA VALLEY WD ID-A&2	Address:	P.O. BOX 730
City:	YUCAIPA	State:	CA
Zip:	92399	Zip ext:	Not Reported
Pop serv:	34000	Connection:	7831
Area serve:	YUCAIPA		

Sample date:	07-FEB-18	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	11-OCT-17	Finding:	9.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	06-JUL-17	Finding:	9.
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	12-APR-17	Finding:	8.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	25-JAN-17	Finding:	8.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	29-NOV-16	Finding:	170.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

Sample date:	29-NOV-16	Finding:	8.3
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-NOV-16	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	9.
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	29-NOV-16	Finding:	0.74
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	29-NOV-16	Finding:	43.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	29-NOV-16	Finding:	21.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	2.2
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	44.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	10.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	51.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	170.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	8.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-NOV-16	Finding:	200.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	7.8
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	29-NOV-16	Finding:	550.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	21-JUN-16	Finding:	8.5
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	25-AUG-15	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	25-AUG-15	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-APR-15	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	21-APR-15	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-JAN-15	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JAN-15	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-AUG-14	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-14	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-MAY-14	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-MAY-14	Finding:	3.7
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	20-MAY-14	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-JAN-14	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	16-JAN-14	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-OCT-13	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-OCT-13	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		

Sample date:	14-AUG-13	Finding:	20.
Chemical:	SOURCE TEMPERATURE C	Report units:	C
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	560.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	7.6
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	180.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	220.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	170.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	52.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	9.9
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	41.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	2.5
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	23.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	38.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	14-AUG-13	Finding:	0.79
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	14-AUG-13	Finding:	7.7
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	14-AUG-13	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	0.75
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported

Dlr:	0.		
Sample date:	14-AUG-13	Finding:	0.15
Chemical:	LANGELIER INDEX AT SOURCE TEMP.	Report units:	Not Reported
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-AUG-13	Finding:	0.2
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	14-AUG-13	Finding:	11.97
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	7100.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-APR-13	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-13	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	29-JAN-13	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-JAN-13	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	08-OCT-12	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-OCT-12	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	28-AUG-12	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	28-AUG-12	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-AUG-12	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-AUG-12	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		

Sample date:	10-JUL-12	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	10-JUL-12	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-APR-12	Finding:	1.35
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	27-APR-12	Finding:	0.449
Chemical:	RADIUM 228 COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	27-APR-12	Finding:	1.34
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	27-APR-12	Finding:	0.2
Chemical:	RADIUM 228 MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	20-APR-12	Finding:	27.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-APR-12	Finding:	320.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-APR-12	Finding:	3.3
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		

G14
North
1/2 - 1 Mile
Higher

CA WELLS 2404

Seq:	2404	Prim sta c:	02S/02W-11A01 S
Frds no:	3610055022	County:	36
District:	13	User id:	TAN
System no:	3610055	Water type:	G
Source nam:	WELL 24	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340100.0	Longitude:	1170300.0
Precision:	8	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3610055	System nam:	Yucaipa Valley Wd Id-A&2
Hqname:	YUCAIPA VALLEY WD ID-A&2	Address:	P.O. BOX 730
City:	YUCAIPA	State:	CA
Zip:	92399	Zip ext:	Not Reported
Pop serv:	34000	Connection:	7831
Area serve:	YUCAIPA		

Sample date:	14-FEB-18	Finding:	8.9

Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-OCT-17	Finding:	8.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JUL-17	Finding:	7.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-APR-17	Finding:	8.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-MAR-17	Finding:	2.6
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	29-MAR-17	Finding:	0.73
Chemical:	URANIUM COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	29-MAR-17	Finding:	0.89
Chemical:	URANIUM MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	29-MAR-17	Finding:	2.5
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	25-JAN-17	Finding:	9.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-SEP-16	Finding:	7.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-SEP-16	Finding:	7.8
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-SEP-16	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	8.1
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	21-SEP-16	Finding:	3.8
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	21-SEP-16	Finding:	0.76
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	21-SEP-16	Finding:	42.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	21-SEP-16	Finding:	17.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	2.3
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	45.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	9.4
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	52.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	170.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	210.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	170.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	530.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	21-SEP-16	Finding:	7.9
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	25-AUG-15	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	25-AUG-15	Finding:	35.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-APR-15	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	22-APR-15	Finding:	34.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-FEB-15	Finding:	360.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	09-FEB-15	Finding:	36.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	14-AUG-14	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-AUG-14	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-MAY-14	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-MAY-14	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-NOV-13	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-NOV-13	Finding:	280.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	21-NOV-13	Finding:	8.2
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	21-NOV-13	Finding:	1.3
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	21-NOV-13	Finding:	2.
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	530.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	7.7
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	170.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	200.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	160.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	50.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		

Sample date:	27-AUG-13	Finding:	9.2
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	49.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	2.3
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	20.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	49.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	27-AUG-13	Finding:	1.1
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	27-AUG-13	Finding:	7.4
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	27-AUG-13	Finding:	0.55
Chemical:	TETRACHLOROETHYLENE	Report units:	UG/L
Dlr:	0.5		
Sample date:	27-AUG-13	Finding:	320.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-13	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-AUG-13	Finding:	7500.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-APR-13	Finding:	190.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	7000.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-APR-13	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-13	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	0.15
Chemical:	FOAMING AGENTS (MBAS)	Report units:	MG/L

Dlr: 0.

Sample date: 30-APR-13 Finding: 2.
Chemical: GROSS ALPHA COUNTING ERROR Report units: PCI/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 8.8
Chemical: GROSS ALPHA Report units: PCI/L
Dlr: 3.

Sample date: 30-APR-13 Finding: 6.9
Chemical: VANADIUM Report units: UG/L
Dlr: 3.

Sample date: 30-APR-13 Finding: 0.98
Chemical: FLUORIDE (F) (NATURAL-SOURCE) Report units: MG/L
Dlr: 0.1

Sample date: 30-APR-13 Finding: 50.
Chemical: SULFATE Report units: MG/L
Dlr: 0.5

Sample date: 30-APR-13 Finding: 20.
Chemical: CHLORIDE Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 2.1
Chemical: POTASSIUM Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 530.
Chemical: SPECIFIC CONDUCTANCE Report units: US
Dlr: 0.

Sample date: 30-APR-13 Finding: 8.
Chemical: PH, LABORATORY Report units: Not Reported
Dlr: 0.

Sample date: 30-APR-13 Finding: 160.
Chemical: ALKALINITY (TOTAL) AS CACO3 Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 1.3
Chemical: GROSS ALPHA MDA95 Report units: PCI/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 150.
Chemical: HARDNESS (TOTAL) AS CACO3 Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 45.
Chemical: CALCIUM Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 8.6
Chemical: MAGNESIUM Report units: MG/L
Dlr: 0.

Sample date: 30-APR-13 Finding: 50.
Chemical: SODIUM Report units: MG/L
Dlr: 0.

Sample date:	11-FEB-13	Finding:	33.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-FEB-13	Finding:	430.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	29-JAN-13	Finding:	37.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-JAN-13	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	08-OCT-12	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-OCT-12	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	03-AUG-12	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-AUG-12	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-APR-12	Finding:	24.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-APR-12	Finding:	310.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	29-FEB-12	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-FEB-12	Finding:	4.
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	03-FEB-12	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

G15
North
1/2 - 1 Mile
Higher

CA WELLS 2409

Seq:	2409	Prim sta c:	02S/02W-12M01 S
Frds no:	3310017005	County:	33
District:	14	User id:	WAT
System no:	3310017	Water type:	G

Source nam:	WELL 06 - ABANDONED	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340100.0	Longitude:	1170300.0
Precision:	8	Status:	AB
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3310017	System nam:	South Mesa Wc
Hqname:	Not Reported	Address:	P O BOX 458
City:	CALIMESA	State:	CA
Zip:	92320	Zip ext:	Not Reported
Pop serv:	7200	Connection:	2539
Area serve:	SOUTH MESA-CALIMESA		

G16
North
1/2 - 1 Mile
Higher

CA WELLS 2406

Seq:	2406	Prim sta c:	02S/02W-11B02 S
Frds no:	3610055013	County:	36
District:	13	User id:	TAN
System no:	3610055	Water type:	G
Source nam:	WELL 12	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340100.0	Longitude:	1170300.0
Precision:	8	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3610055	System nam:	Yucaipa Valley Wd Id-A&2
Hqname:	YUCAIPA VALLEY WD ID-A&2	Address:	P.O. BOX 730
City:	YUCAIPA	State:	CA
Zip:	92399	Zip ext:	Not Reported
Pop serv:	34000	Connection:	7831
Area serve:	YUCAIPA		

Sample date:	09-FEB-18	Finding:	8.1
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	11-OCT-17	Finding:	8.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	06-JUL-17	Finding:	7.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	12-APR-17	Finding:	7.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	29-MAR-17	Finding:	2.4
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

Sample date:	29-MAR-17	Finding:	0.66
Chemical:	URANIUM COUNTING ERROR	Report units:	PCI/L

Dlr: 0.

Sample date:	29-MAR-17	Finding:	0.88
Chemical:	URANIUM MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	29-MAR-17	Finding:	2.4
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	25-JAN-17	Finding:	6.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-SEP-16	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	22-SEP-16	Finding:	7.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUN-16	Finding:	2.5
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	16.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	0.48
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	22-JUN-16	Finding:	3.9
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	22-JUN-16	Finding:	4.7
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	22-JUN-16	Finding:	9.9
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	22-JUN-16	Finding:	2.7
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	0.6
Chemical:	TETRACHLOROETHYLENE	Report units:	UG/L
Dlr:	0.5		
Sample date:	22-JUN-16	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	7.6
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	22-JUN-16	Finding:	2.
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	33.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	10.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	55.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	180.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	7.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUN-16	Finding:	220.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	180.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	7.6
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	520.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	22-JUN-16	Finding:	35.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	25-AUG-15	Finding:	32.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-AUG-15	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	21-APR-15	Finding:	31.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-APR-15	Finding:	320.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JAN-15	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	15-JAN-15	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-14	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-14	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-MAY-14	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	20-MAY-14	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-MAR-14	Finding:	3.9
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	16-JAN-14	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-JAN-14	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	23-OCT-13	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	23-OCT-13	Finding:	29.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-AUG-13	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	14-AUG-13	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-13	Finding:	2.7
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	1.5
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	6300.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	30-APR-13	Finding:	28.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-13	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	0.15
Chemical:	FOAMING AGENTS (MBAS)	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	1.8
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	4.7
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	30-APR-13	Finding:	5.5
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	30-APR-13	Finding:	0.47
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	30-APR-13	Finding:	37.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	30-APR-13	Finding:	530.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	30-APR-13	Finding:	7.9
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	30-APR-13	Finding:	190.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	230.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	190.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	57.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	11.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	30-APR-13	Finding:	35.
Chemical:	SODIUM	Report units:	MG/L

Dlr:	0.		
Sample date:	30-APR-13	Finding:	18.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	29-JAN-13	Finding:	320.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	29-JAN-13	Finding:	27.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-DEC-12	Finding:	270.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	26-DEC-12	Finding:	30.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-OCT-12	Finding:	340.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	08-OCT-12	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-AUG-12	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-AUG-12	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	01-AUG-12	Finding:	320.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	01-AUG-12	Finding:	25.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-JUL-12	Finding:	350.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	10-JUL-12	Finding:	26.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

F17
SSW
1/2 - 1 Mile
Lower

CA WELLS **CADWR8000006333**

State Well #:	02S02W14R001S	Station ID:	26177
Well Name:	Not Reported	Well Use:	Unknown

Well Type:	Unknown	Well Depth:	0
Basin Name:	San Timoteo	Well Completion Rpt #:	Not Reported

H18
NE
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000006376**

State Well #:	02S02W12H002S	Station ID:	2656
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

H19
NE
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000006377**

State Well #:	02S02W12H003S	Station ID:	2657
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

H20
NE
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000006378**

State Well #:	02S02W12H004S	Station ID:	26174
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

H21
NE
1/2 - 1 Mile
Higher

CA WELLS **CADWR8000006375**

State Well #:	02S02W12H001S	Station ID:	26173
Well Name:	Not Reported	Well Use:	Unknown
Well Type:	Unknown	Well Depth:	0
Basin Name:	Yucaipa	Well Completion Rpt #:	Not Reported

H22
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000139782**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W12H002S	Type:	Well
Description:	Not Reported	HUC:	18070203

Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19980526	Well Depth:	655
Well Depth Units:	ft	Well Hole Depth:	852
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	71	Level reading date:	2004-12-22
Feet below surface:	353.73	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-11-24	Feet below surface:	352.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-11-08	Feet below surface:	352.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-09-22	Feet below surface:	352.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-08-25	Feet below surface:	351.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-07-20	Feet below surface:	350.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-06-23	Feet below surface:	350.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-05-19	Feet below surface:	349.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-22	Feet below surface:	348.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-03-24	Feet below surface:	348.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-02-18	Feet below surface:	348.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-01-21	Feet below surface:	346.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-12-17	Feet below surface:	346.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-18	Feet below surface:	346.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-10-22	Feet below surface:	345.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-09-18	Feet below surface:	342.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-13	Feet below surface:	343.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-23	Feet below surface:	343.30

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-10	Feet below surface:	342.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-02	Feet below surface:	342.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-06-24	Feet below surface:	342.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-05-20	Feet below surface:	341.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-03-19	Feet below surface:	341.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-02-21	Feet below surface:	339.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-01-21	Feet below surface:	340.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-12-19	Feet below surface:	339.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-20	Feet below surface:	338.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-10-09	Feet below surface:	337.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-09-18	Feet below surface:	337.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-16	Feet below surface:	336.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-07-17	Feet below surface:	335.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-27	Feet below surface:	335.61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-19	Feet below surface:	335.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-05-21	Feet below surface:	335.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-18	Feet below surface:	334.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-03-20	Feet below surface:	334.31
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-02-20	Feet below surface:	333.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-01-17	Feet below surface:	333.42
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-12-20	Feet below surface:	330.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-30	Feet below surface:	332.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-10-15	Feet below surface:	332.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-09-18	Feet below surface:	331.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-08-22	Feet below surface:	331.21
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-07-10	Feet below surface:	330.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-06-12	Feet below surface:	330.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-25	Feet below surface:	330.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-11	Feet below surface:	329.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-03-15	Feet below surface:	329.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-02-22	Feet below surface:	329.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-01-25	Feet below surface:	329.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-12-19	Feet below surface:	328.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-11-28	Feet below surface:	328.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-18	Feet below surface:	328.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-09-14	Feet below surface:	327.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-08-14	Feet below surface:	327.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-07-13	Feet below surface:	327.36
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-06-13	Feet below surface:	327.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-05-18	Feet below surface:	327.39
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-20	Feet below surface:	327.47
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2000-03-14	Feet below surface:	327.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-02-16	Feet below surface:	328.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-01-20	Feet below surface:	328.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-12-16	Feet below surface:	329.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-11-05	Feet below surface:	329.91
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-04	Feet below surface:	327.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-09-14	Feet below surface:	328.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-08-19	Feet below surface:	328.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-07-21	Feet below surface:	329.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-06-21	Feet below surface:	333.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-05-25	Feet below surface:	334.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-29	Feet below surface:	328.78
Feet to sea level:	Not Reported	Note:	Not Reported

H23
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000139781**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W12H001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19980526	Well Depth:	850
Well Depth Units:	ft	Well Hole Depth:	852
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	76	Level reading date:	2004-12-22
Feet below surface:	350.87	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-11-24	Feet below surface:	350.34
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2004-11-08	Feet below surface:	350.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-09-22	Feet below surface:	349.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-08-25	Feet below surface:	348.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-07-20	Feet below surface:	348.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-06-23	Feet below surface:	347.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-05-19	Feet below surface:	347.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-22	Feet below surface:	346.61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-03-24	Feet below surface:	346.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-02-18	Feet below surface:	345.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-01-21	Feet below surface:	344.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-12-17	Feet below surface:	344.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-18	Feet below surface:	343.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-10-22	Feet below surface:	343.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-09-18	Feet below surface:	342.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-28	Feet below surface:	342.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-13	Feet below surface:	341.26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-23	Feet below surface:	341.43
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-06-24	Feet below surface:	340.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-05-20	Feet below surface:	340.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-04-17	Feet below surface:	339.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-03-19	Feet below surface:	338.74
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2003-02-21	Feet below surface:	338.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-01-21	Feet below surface:	338.16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-12-19	Feet below surface:	337.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-20	Feet below surface:	337.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-10-09	Feet below surface:	336.44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-09-18	Feet below surface:	336.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-26	Feet below surface:	335.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-16	Feet below surface:	335.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-09	Feet below surface:	335.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-07-17	Feet below surface:	335.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-27	Feet below surface:	334.67
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-19	Feet below surface:	334.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-05-21	Feet below surface:	334.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-18	Feet below surface:	333.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-03-20	Feet below surface:	333.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-02-20	Feet below surface:	332.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-01-17	Feet below surface:	332.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-12-20	Feet below surface:	332.16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-30	Feet below surface:	331.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-10-15	Feet below surface:	331.11
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-09-18	Feet below surface:	330.65
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-08-22	Feet below surface:	330.23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-07-10	Feet below surface:	329.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-06-12	Feet below surface:	329.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-25	Feet below surface:	329.16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-11	Feet below surface:	328.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-03-15	Feet below surface:	328.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-02-22	Feet below surface:	328.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-01-25	Feet below surface:	328.26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-12-19	Feet below surface:	328.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-11-28	Feet below surface:	327.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-18	Feet below surface:	327.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-09-14	Feet below surface:	326.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-08-14	Feet below surface:	326.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-07-13	Feet below surface:	326.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-06-13	Feet below surface:	326.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-05-18	Feet below surface:	326.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-20	Feet below surface:	326.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-03-14	Feet below surface:	327.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-02-16	Feet below surface:	327.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-01-20	Feet below surface:	327.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-12-16	Feet below surface:	328.55
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1999-11-05	Feet below surface:	329.11
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-04	Feet below surface:	329.01
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-09-14	Feet below surface:	329.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-08-19	Feet below surface:	329.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-07-21	Feet below surface:	329.57
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-06-21	Feet below surface:	329.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-05-25	Feet below surface:	329.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-29	Feet below surface:	323.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-28	Feet below surface:	332.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-20	Feet below surface:	331.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-14	Feet below surface:	332.48
Feet to sea level:	Not Reported	Note:	Not Reported

H24
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000139784**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W12H004S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19980526	Well Depth:	400
Well Depth Units:	ft	Well Hole Depth:	852
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	74	Level reading date:	2004-12-22
Feet below surface:	349.00	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-11-24	Feet below surface:	348.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-11-08	Feet below surface:	348.38
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2004-09-22	Feet below surface:	347.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-08-25	Feet below surface:	347.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-07-20	Feet below surface:	346.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-06-23	Feet below surface:	346.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-05-19	Feet below surface:	345.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-22	Feet below surface:	344.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-03-24	Feet below surface:	344.46
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-02-18	Feet below surface:	343.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-01-21	Feet below surface:	343.39
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-12-17	Feet below surface:	342.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-18	Feet below surface:	342.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-10-22	Feet below surface:	341.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-09-18	Feet below surface:	340.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-28	Feet below surface:	340.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-13	Feet below surface:	340.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-23	Feet below surface:	339.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-06-24	Feet below surface:	338.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-05-20	Feet below surface:	338.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-04-17	Feet below surface:	337.67
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-03-19	Feet below surface:	337.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-02-21	Feet below surface:	336.78
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2003-01-21	Feet below surface:	336.16
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-12-19	Feet below surface:	335.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-20	Feet below surface:	335.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-10-09	Feet below surface:	334.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-09-18	Feet below surface:	333.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-16	Feet below surface:	333.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-07-17	Feet below surface:	332.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-27	Feet below surface:	332.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-19	Feet below surface:	331.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-05-21	Feet below surface:	331.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-18	Feet below surface:	331.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-03-20	Feet below surface:	330.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-02-20	Feet below surface:	330.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-01-17	Feet below surface:	330.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-12-20	Feet below surface:	329.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-30	Feet below surface:	329.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-10-15	Feet below surface:	328.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-09-18	Feet below surface:	327.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-08-22	Feet below surface:	327.46
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-07-10	Feet below surface:	326.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-06-12	Feet below surface:	326.31
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-05-25	Feet below surface:	326.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-11	Feet below surface:	325.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-03-15	Feet below surface:	325.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-02-22	Feet below surface:	325.07
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-01-25	Feet below surface:	324.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-12-19	Feet below surface:	324.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-11-28	Feet below surface:	323.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-18	Feet below surface:	323.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-09-14	Feet below surface:	323.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-08-14	Feet below surface:	322.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-07-13	Feet below surface:	322.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-06-13	Feet below surface:	322.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-05-18	Feet below surface:	322.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-20	Feet below surface:	322.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-03-14	Feet below surface:	323.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-02-16	Feet below surface:	323.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-01-20	Feet below surface:	324.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-12-16	Feet below surface:	324.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-11-05	Feet below surface:	325.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-04	Feet below surface:	326.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-09-14	Feet below surface:	326.10
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1999-08-19	Feet below surface:	326.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-07-21	Feet below surface:	326.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-06-21	Feet below surface:	327.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-05-25	Feet below surface:	327.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-29	Feet below surface:	327.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-28	Feet below surface:	329.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-20	Feet below surface:	328.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-15	Feet below surface:	327.46
Feet to sea level:	Not Reported	Note:	Not Reported

H25
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000139783**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W12H003S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19980526	Well Depth:	530
Well Depth Units:	ft	Well Hole Depth:	852
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	74	Level reading date:	2004-12-22
Feet below surface:	351.24	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2004-11-24	Feet below surface:	351.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-11-08	Feet below surface:	349.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-09-22	Feet below surface:	349.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-08-25	Feet below surface:	349.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-07-20	Feet below surface:	348.61
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2004-06-23	Feet below surface:	348.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-05-19	Feet below surface:	347.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-04-22	Feet below surface:	347.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-03-24	Feet below surface:	346.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-02-18	Feet below surface:	345.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2004-01-21	Feet below surface:	345.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-12-17	Feet below surface:	344.93
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-11-18	Feet below surface:	344.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-10-22	Feet below surface:	343.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-09-18	Feet below surface:	342.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-28	Feet below surface:	342.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-08-13	Feet below surface:	342.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-07-23	Feet below surface:	341.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-06-24	Feet below surface:	341.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-05-20	Feet below surface:	340.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-04-17	Feet below surface:	339.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-03-19	Feet below surface:	339.44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-02-21	Feet below surface:	339.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-01-21	Feet below surface:	338.43
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-12-19	Feet below surface:	337.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-11-20	Feet below surface:	337.27
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2002-10-09	Feet below surface:	336.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-09-18	Feet below surface:	335.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-08-16	Feet below surface:	335.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-07-17	Feet below surface:	334.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-27	Feet below surface:	334.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-06-19	Feet below surface:	334.26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-05-21	Feet below surface:	334.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-18	Feet below surface:	333.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-03-20	Feet below surface:	333.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-02-20	Feet below surface:	332.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-01-17	Feet below surface:	332.38
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-12-20	Feet below surface:	331.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-11-30	Feet below surface:	331.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-10-15	Feet below surface:	330.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-09-18	Feet below surface:	330.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-08-22	Feet below surface:	329.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-07-10	Feet below surface:	329.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-06-12	Feet below surface:	328.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-05-25	Feet below surface:	328.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-11	Feet below surface:	328.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-03-15	Feet below surface:	328.07
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-02-22	Feet below surface:	327.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-01-25	Feet below surface:	327.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-12-19	Feet below surface:	327.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-11-28	Feet below surface:	326.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-18	Feet below surface:	326.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-09-14	Feet below surface:	325.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-08-14	Feet below surface:	325.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-07-13	Feet below surface:	325.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-06-13	Feet below surface:	325.39
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-05-18	Feet below surface:	325.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-20	Feet below surface:	325.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-03-14	Feet below surface:	326.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-02-16	Feet below surface:	326.43
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-01-20	Feet below surface:	326.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-12-16	Feet below surface:	327.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-11-05	Feet below surface:	328.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-04	Feet below surface:	328.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-09-14	Feet below surface:	328.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-08-19	Feet below surface:	329.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-07-21	Feet below surface:	329.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-06-21	Feet below surface:	329.65
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1999-05-25	Feet below surface:	329.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-29	Feet below surface:	329.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-28	Feet below surface:	331.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-20	Feet below surface:	331.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-07-14	Feet below surface:	331
Feet to sea level:	Not Reported	Note:	Not Reported

26
WNW
1/2 - 1 Mile
Lower

FED USGS USGS40000139753

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W11M001S	Type:	Well
Description:	ROCKWELL GPS FOR LAT/LONG., NAD27		
HUC:	18070203	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported	Aquifer:	California Coastal Basin aquifers
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

27
West
1/2 - 1 Mile
Lower

FED USGS USGS40000139712

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	002S002W14D001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	194605	Well Depth:	400
Well Depth Units:	ft	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

1G
West
1/2 - 1 Mile
Lower

AQUIFLOW 66387

Site ID:	083302496T
Groundwater Flow:	Not Reported
Shallow Water Depth:	168’
Deep Water Depth:	322’
Average Water Depth:	Not Reported
Date:	06/02/1994

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92320	4	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

Appendix F – Hydrology Study

CALIMESA CHANNEL STORM DRAIN IMPROVEMENT PROJECT STAGE III

HYDROLOGY STUDY

April 2019

Prepared for:

City of Calimesa
908 Park Avenue
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Prepared by:

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TABLE OF CONTENTS

1. INTRODUCTION

This report presents a summary of the hydrology and hydraulic studies perform for the proposed Calimesa Channel Storm Drain Improvement "Stage III" (Project). The improvements will take place along the Calimesa Channel storm drain system, one of the five mayor flood control systems traversing the City of Calimesa (City) predominantly in the Southwest direction, all of them been tributary to San Timoteo Creek, a mayor tributary of the upper Santa Ana River. The proposed Project is located on the east side of the Interstate 10 between Avenue H (City of Yucaipa) to the north and Avenue L (City of Calimesa) to the south, in T2S, R2W in Riverside County and has a tributary watershed of 823 acres. The Project is sponsored by the City and the Riverside County Flood Control and Water Conservation District (RCFC&WCD).

2. PROJECT DESCRIPTION

The Project is situated in the proposed Downtown Business District (DBD) in the City and runs along the boundary between Riverside and San Bernardino Counties, and between the City and City of Yucaipa; see Exhibit 1 – Vicinity Map. The proposed Project is considered a continuation of the Calimesa Channel "Stage I" project completed by the RCFC&WCD (Project No. 5-10-160) and is a component of an ultimate storm drain system that will provide 100-year flood protection to existing developments along County Line Road, surrounding the Calimesa DBD.

Calimesa Channel "Stage I" and "Stage II" consists of a concrete lined trapezoidal channel beginning at County Line Road, approximately 500 feet west of California Street. The existing trapezoidal channel, with a base width of 4 feet and a depth of 5 feet, meanders westerly through existing residential neighborhoods and outlets on the west side of 5th Street. Thereafter, the Calimesa Creek is an unimproved earthen channel that continues meandering westerly through the City's DBD, to near Interstate 10 (I-10) Freeway where an improved storm drain system carried flow under the freeway. Following is again an unimproved earthen channel that continues meandering westerly and southwesterly to the San Timoteo Creek.

The proposed Project (Calimesa Channel "Stage III") consists of a detention basin and a storm drain system to provide 100-year flood protection. The proposed detention basin is adjacent to the existing Calimesa Channel "Stage I", approximately 200 linear feet (LF) west of 3rd Street. The proposed storm drain system consists of approximately 312 linear feet (LF) of 78 inch diameter reinforced concrete pipe (RCP), 1,630 LF of 72 inch diameter RCP, 170 LF of 6 foot x 6 foot reinforced concrete box (RCB), 60 LF of RCB to trapezoidal channel transition, with associated catch basins and connector pipes. The Project is sized to convey the ultimate develop condition, 100-year storm flow for the Calimesa Channel watershed upstream from the existing storm drain system at I-10 Freeway; see Exhibit 4, Nodes 99 and 98.

3. PURPOSE

The purpose of this study is to determine the 100-year peak flow rates and hydrograph volumes from the drainages areas tributary to the Project site for both the existing and ultimate developed condition. In addition, this study will confirm detention basin sizing required to reduce the ultimate developed condition peak flows to be manageable within existing storm drain facilities near I-10 and downstream the Project.

4. HYDROLOGY

4.1 Methodology

For this analysis, both the Rational Method and the Unit Hydrograph Method were used. According to Riverside County Flood Control and Water Conservation District Hydrology Manual, published in 1978 (Hydrology Manual), the Rational Method is to be used for drainage areas smaller than 300 to 500 acres, and the Unit Hydrograph Method is to be used for areas larger than 300 to 500 acres. In this study, it was decided to use 500 acres as an approximate (more conservative) break point to switch from the Rational Method to the Unit Hydrograph method to estimate the peak flow rates.

The AES RATSC hydrology model has the ability to switch between these two peak flow estimation methods using one data base of hydrologic information. The computer model has an internal bookkeeping system which develops the area-average values of the loss rate, low loss rate fraction and rainfall depths for the Unit Hydrograph analysis. The time of concentration (Tc) of the longest flow path is used in the Unit Hydrograph lag estimation. If the total tributary area at any concentration point is greater than 500 acres and the time of concentration (Tc) is greater than 12.5 minutes, the hydrologic analysis can then be switched from Rational Method to the Unit Hydrograph Method without leaving the computer model.

The Rational Method modeling approach is widely used due to the simplicity in application, and the capability for estimating peak runoff rates throughout the study watershed. The Unit Hydrograph Method was used to develop peak flow rates for drainage area greater than 500 acres. The unit Hydrograph lag time is calculated as (0.8) Tc, where Tc is the Rational Method time of concentration for the longest flow path. In the Unit Hydrograph study, the "Valley" S-graph was used.

For the Existing Condition, the AES RATSC hydrology model was used to calculate peak flow rates, as described above, see Appendix B.1. For the Ultimate Developed Condition, single area Unit Hydrographs were developed to calculate peak flow rates using the U.S. Army Corp of Engineers (USACE) "Empirical Formula", AES software was designed to accept watershed data and to perform synthetic unit hydrograph method analyses in accordance with the Hydrology Manual. This process ensures all sub-areas are included in the hydrology analysis; whereas with just AES, smaller areas after a confluence (or basin routing in this case) may not be applied to the overall flow analysis. In addition, this method defines the study area by the distance of the longest flow path, tributary area, centroid location and area loss rate; as shown in Exhibit 3.

4.2 Topography and Drainage Boundaries

Hydrologic boundaries for the Existing and Ultimate Developed Conditions were based on the existing topographic conditions that were created either by natural causes or by the effect of the City's urbanization, see Exhibit 2. Elevation data for the Calimesa Channel "Stage III" was obtain from a field survey performed by TKE Engineering for the roadway and existing creek between I-10 Freeway and 5th Street, and for the basin site near 3rd Street. Additional elevation data was taken from other TKE Engineering field surveys performed for the City, Calimesa Channel "Stage I" and "Stage II" plan set, and online Digital Elevation Model (DEM) with data collected by NASA's Shuttle Radar Topography Mission (SRTM). Note, a correction factor was applied to this last data source to match field survey datum.

4.3 Land use and Zoning

Land use and zoning within the Calimesa Channel "Stage III" watershed is based on review of the existing development patterns, field reconnaissance, aerial photos, assessor's parcel data, the City's General Plan, and the City of Yucaipa's General Plan. Undeveloped parcels were assumed to be developed for the Ultimate Developed Condition analysis, based on the land use designations consistent with both Cities general plans and existing development patterns.

4.4 Soil Type Designations

The underlying hydrologic soil groups are Types A, B, C, and D as shown on the RCFC&WCD Hydrology Manual Plate C-1.06 and on the San Bernardino County Flood Control District Hydrology Manual Figure C-16.

4.5 Rainfall

The precipitation depth used in the AES RATSC hydrology model were based on those reported on the RCFC&WCD Hydrology Manual, see Plates E-5.2, E-5.4 and E-5.6, for the 100-year storm event for 3-hour, 6-hour and 24-hour durations, respectively. Per the RCFC&WCD Hydrology Manual, all three durations were analyzed, see Section 5 for additional information.

4.6 Ground Cover

The undeveloped ground cover consists of natural covers including native grasses and broadleaf chaparral in fair condition with runoff index numbers per the RCFC&WCD Hydrology Manual Plate E-6.1. The developed condition ground cover consists of landscaping over pervious areas as well as impervious surfaces consisting of roofs, sidewalks, driveways, and roadways. The percent of impervious area is based on the recommended percentages stated in the RCFC&WCD Hydrology Manual Plate E-6.3.

4.7 Loss Rates

Loss rates for the Existing and Ultimate Developed Conditions were calculated based on the RCFC&WCD Hydrology Manual procedures. Existing Condition data input computed (AES RATSC hydrology model) based on the weighted average of soil type and ground cover components of each watershed. Ultimate Developed Condition used similar methods as presented in the RCFC&WCD Hydrology Manual (Plate E-2.1), see Appendix B.4, but included impervious areas based on proposed developments plans.

4.8 Drainage Pattern/Mapping

As mention before, the Calimesa Creek system, east of I-10 Freeway, has a tributary watershed area of 823 acres. The existing storm flows travel mainly on the east to west and southwest direction, starting from most upstream areas located at the City's eastern boundary and adjacent to the San Bernardino National Forest.

The primary stream originates in the City of Yucaipa on Mesa Grande Drive (Exhibit 2, Node 1806), then along County Line Road where storm flows are conveyed through the street. As flows approach Bryant Street, they are combined with flows traveling on the Southwest direction coming from a natural earthen channel (Exhibit 2, Node 114). From this confluence point, flows continue to travel in the east to west direction along County Line Road on a combination of street flow with an unimproved channel running parallel and street flow with a pipe running parallel up to California Street. At California Street, flows are conveyed through two 42 inch RCPs up to 530 LF west to the beginning of the existing improved trapezoidal concrete-lined channel (Calimesa Channel "Stage II") (Exhibit 2, Node 111). The Calimesa Channel "Stage II" and "Stage I" carries storm flow, picking up additional flows at 2nd Street (Exhibit 2, Node 109), 3rd Street (Exhibit 2, Node 107), 4th Street (Exhibit 2, Node 106), and 5th Street (Exhibit 2, Node 105), to west of 5th Street (Exhibit 2, Node 104).

From California Street to 5th Street and north of County Line Road, storm runoff travels on the east to west direction predominantly as sheet flows, until they intersect and flow into the north to south streets (2nd Street, 3rd Street, 4th Street, and 5th Street). Flows then travel south to County Line Road, where they are collected via drop inlets or catch basins and then conveyed to the existing improved Calimesa Channel, as described above.

From 5th Street, the unimproved earthen channel (Calimesa Creek) continues to convey flows westerly, picking up additional flows at Calimesa Boulevard (Exhibit 2, Node 101), to near I-10 Freeway where an improved storm drain system carries flows under the freeway (Exhibit 2, Node 99).

The proposed Project will join the existing trapezoidal channel, near 5th Street (Exhibit 3, Node 104) and transition from a trapezoidal channel to a 6 foot x 6 foot RCB. Subsequently, the RCB continues northwest toward County Line Road (Exhibit 3, Node 994) were a low-flow diversion structure will send a portion of flows to the existing Calimesa Creek (Exhibit 4, from Node 994 to Node 997 to Node 996). The remaining flows, including 100-year flows, will continue northwest toward County Line Road, transitioning to a 72 inch RCP (Exhibit 3, at Node 993). From there, the 72 inch RCP will convey flows westerly along

County Line Road to Calimesa Boulevard, picking up additional flow at Nodes 992 and 991 (See Exhibit 3). After this confluence, a 78 inch RCP will convey flows along County Line Road westerly, then curve southwesterly to connect to the existing the 78 inch RCP (Exhibit 3, Node 99).

The end of the proposed Project (Calimesa Channel "Stage III") connects to an existing 78 inch RCP that crosses beneath a parking lot, then confluences with storm flows from the Avenue L Storm Drain System (RCFC&WCD Project No. 5-0-0165); see Exhibit 4, Node 98. This is the concentration point for two watersheds: Calimesa Avenue L watershed and the Calimesa Creek watershed. This confluence sump is the inlet for the existing 6 foot x 6 foot RCB that conveys flows under I-10 Freeway then into the existing natural drainage channel then ultimately flows to San Timoteo Creek.

5. RESULTS

5.1 Storm Drain Hydraulic Model

A hydraulic model for the existing 78 inch RCP at the downstream end of the proposed Project was develop using CivilDesign's Water Surface and Pressure Gradient Hydraulic Analysis program (WSPG). The hydraulic model was run for the Ultimate Developed Condition 100-year storm flow and can be found in Appendix C.1. Based on the rating table of the existing 6 foot x 6 foot RCB under I-10 Freeway (see Calimesa-Avenue L Storm Drain Project No. 5-0-0165 Appendix E.4), the maximum flow rate "*due to its limited hydraulic capacity*" is 690 cubic feet per second (cfs) with water surface elevation of 13.64 feet above pipe flowline when the sump is "*full*", prior to overflowing onto the I-10 off ramps and County Line Road. In order to have consistent analysis with Calimesa-Avenue L Storm Drain calculations, a hydraulic grade line (HGL) with a maximum water surface elevation of 2,372.77 feet (Existing 108" RCP Flow Line = 2,359.13 feet + 13.64 feet) was used as the starting water surface elevation for the WSPG modeling.

5.2 Hydrology/Hydraulics: Existing Developed Condition

The general drainage pattern and distribution of flows for the existing condition was described in Section 4.8 and is shown on Exhibit 2. A summary of peak flows for the three rainfall events is presented in Table 1 below. Since the 3-hour rainfall event generated the highest peak flow rates, it was selected as the governing existing condition hydrology; see the full hydrology report in Appendix B.1. Starting at 5th Street (Exhibit 2, Node 104), there is a 100-year tributary runoff of 1,043 cfs coming from the existing trapezoidal channel, with a portion of the top 1.0 feet of free board being used under this storm event. The channel then widens and transitions to earthen channel through ungrouted rip-rap. Flows continue traveling west though a winding earthen channel, with vegetation growth. The 100-year tributary runoff of 1,043 cfs is kept within the most critical cross section of the existing creek before the culvert crossing at Park Avenue (Exhibit 2, Node 103). The Park Avenue crossing consists of an existing 54" corrugated metal pipe (CMP). The 54" CMP can convey a 100-year storm flow of 217 cfs with a maximum channel elevation of 2,418.00 feet. Therefore, the Park Avenue crossing is critically deficient in managing 100-year tributary runoff of 1,043 cfs, see culvert analysis in Appendix C.2. In a 100-year storm event, storm flows (approximately 817 cfs) would backup behind the Park Avenue crossing and eventually overflow onto Park Avenue and County Line Road. Of note, the City has experienced flooding at the Fire Station and City Hall approximately 150 feet south of said crossing during even moderate storm event.

Table 1
Existing Condition – Synthetic Unit Hydrograph
100-Year Storm Event

Node Number	Tributary Area (Acre)	Peak Flow Rate (CFS)		
		3-Hour	6-Hour	24-Hour
107	591	804	710	448
104	784	1,043	919	592
99	823	1,047	920	604

After Park Avenue culvert crossing (Exhibit 2, Node 102), it is assumed that a majority of the overflows will be redirected back in to Calimesa Creek, and continue flowing westerly though the existing earthen channel with vegetation and tree growth at the base and walls of the channel. The 100-year tributary runoff of 1,043 cfs is again kept within the most critical cross section of the existing creek before the culvert crossing at Calimesa Boulevard (Exhibit 2, Node 101). Here, the existing flows confluence with stream flows from both the north and south, for a peak flow runoff of 1,051 cfs after confluence. The Calimesa Boulevard crossing consists of an existing 6 foot x 6 foot RCB and can convey a 100-year storm flow of 403 cfs with a maximum channel elevation of 2,391.50 feet. Therefore, the Calimesa Boulevard crossing is critically deficient in managing 100-year tributary runoff of 1,051 cfs, see culvert analysis in Appendix C.3. In a 100-year storm event, storm flows (approximately 648 cfs) would backup behind the Calimesa Boulevard crossing and eventually overflowing onto private property and Calimesa Boulevard.

After Calimesa Boulevard culvert crossing (Exhibit 2, Node 100), it is assumed that a majority of the overflows will be redirected back in to Calimesa Creek, and continue flowing westerly though the existing earthen channel with vegetation and tree growth at the base and walls of the channel. The 100-year tributary runoff of 1,051 cfs is again kept within the most critical cross section of the existing creek before the downstream culvert inlet east of I-10 Freeway (Exhibit 2, Node 99). Here, the existing flows enter into the existing 78 inch RCP, discussed in Section 5.1. As described above, the existing 78 inch RCP can convey a 100-year storm flow of 754 cfs. Therefore, the 78 inch RCP is critically deficient in managing 100-year tributary runoff of 1,051 cfs, see culvert analysis in Appendix C.1. In a 100-year storm event, storm flows (approximately 297 cfs) would backup and eventually overflowing onto private property and County Line Road.

As described in Section 4.8, the 78 inch RCP cross beneath a parking lot (for Baker's Restaurant) and outlets in to a sump (Exhibit 4, Node 98), where it confluences with storm flows from the Avenue L Storm Drain System. This sump drains to the existing 6 foot x 6 foot RCB that crosses under I-10 Freeway. Base on the RCFC&WCD's sump analysis, the I-10 Freeway culvert crossing is critically deficient in conveying the 100-year tributary runoff, causing overflow onto County Line Road and the I-10 Freeway underpass. Overflow runoff would then travel west, through the existing roadway, and then south until draining back into the existing unimproved Calimesa Creek at 7th Place.

5.3 Hydrology/Hydraulics: Ultimate Developed Condition

The Ultimate Developed Condition is shown on Exhibit 3. The primary objective of the ultimate storm drain system is to provide 100-year flood protection within the existing Calimesa Creek watershed, with the greatest benefit along County Line Road and the City's DBD. The general drainage pattern and distribution of flows for the proposed Project was described in Section 4.8. A summary of peak flows for the three rainfall events is presented in Table 2 below. Since the 3-hour rainfall event generated the highest peak flow rates, it was selected as the governing Ultimate Developed Condition hydrology; see the full hydrology report in Appendix B.2. East of 3rd Street, the Calimesa Channel "Stage I" 100-year flow rate of 811.48 cfs will be diverted into a detention basin (Exhibit 3, Node 1062). The proposed 53 acre-foot detention basin will reduce 100-year flows leaving the basin to 375 cfs (Exhibit 3, Node 1061); see Section 5.4 for detailed basin routing analysis.

Table 2
Ultimate Condition – Synthetic Unit Hydrograph
100-Year Storm Event

Node Number	Tributary Area (Acre)	Peak Flow Rate (CFS)		
		3-Hour	6-Hour	24-Hour
107	591	812	704	435
104	784	608	372	343
99	823	662	422	385

The reduced 100-year flows would continue down the existing trapezoidal channel to west of 5th Street (Exhibit 3, Node 104). There, the proposed Project will transition the 100-year flow rate of 608 cfs from the existing trapezoidal channel into a 6 foot x 6 foot RCB. Then, the RCB continues northwest toward County Line Road were a low-flow diversion structure will send a portion of flows to the existing Calimesa Creek (Exhibit 4, Node 994). Approximately 60 cfs will be diverted back into the existing Calimesa Creek. The remaining 100-year flow rate of 547 cfs will continue northwest toward County Line Road, transitioning to a 72 inch RCP (Exhibit 4, at Node 993). From there, the 72 inch RCP will convey said flows westerly along County Line Road to Calimesa Boulevard. At Calimesa Boulevard, additional flows are picked up (Exhibit 4, Nodes 992 and 991), for a combined 100-year flow rate of 662 cfs. After this confluence, a 78 inch RCP will convey the 100-year flows along County Line Road westerly, then curve southwesterly to connect to the existing the 78 inch RCP (Exhibit 4, Node 99). The 100-year flow rate at the connection to the existing 78 inch RCP is 663 cfs. As described in Section 5.1, the existing 78 inch RCP (Calimesa-Avenue L Storm Drain Project No. 5-0-0165) can adequately convey up to 690 cfs with a water surface elevation of 13.64 feet above pipe flowline when the sump is "full"; therefore, it can convey the proposed Project flows downstream.

Of note, the proposed system was also modeled under the assumption that there was no low flow diversion (Exhibit 4, Node 994) to account for any potential blockage or issues with the existing creek system or should the City elect to eliminate it entirely. Again, the 3-hour rainfall event generated the highest peak flow rates and was selected as the governing Ultimate Developed Condition hydrology with no low flow outlet (i.e. no flow split); see the full hydrology report in Appendix B.3. Under this scenario, the full 100-year flow rate of 607 cfs at Node 994 would continue down County Line Road to Calimesa Boulevard. At Calimesa Boulevard, additional flows are picked up (Exhibit 4, Nodes 992 and 991) for a combined 100-year flow rate of 662 cfs. After this confluence, a 78 inch RCP will convey the 100-year flows along County Line Road westerly, then curve southwesterly to connect to the existing the 78 inch RCP (Exhibit 4, Node 99). The 100-year flow rate, under this worst-case scenario, at the connection to the existing 78 inch RCP is 662 cfs; and as described in Section 5.1, the existing 78 inch RCP can adequately convey these flows downstream.

5.4 Detention Basin Routing

The hydrology computed for the Ultimate Drainage Condition was used in combination with the proposed detention basin properties to perform basin routing calculations; See Exhibit 3 for detailed basin routing. Basin storage properties are based on an area and depth for the proposed basin grading. Basin discharge through the low-flow outlet was based on inlet control analysis of the proposed dual 42 inch RCP outlets; see Appendix C.4. The basin data was entered into the AES Flood Routing Analysis downstream of the basin's tributary inflow hydrograph. Basin outflows were then Channel Routed back into the existing channel to continue the routing process (Convex Method) downstream by combining additional subareas hydrographs up to the connection point at the existing 78" RCP (Exhibit 4, Node 99). A summary of the reservoir routing results for the three rainfall events is presented in Table 3 below. Since the 3-hour rainfall event generated the highest peak inflow, it was selected as the governing Ultimate Developed Condition hydrology; see the full hydrology report in Appendix B.2. The proposed detention basin will receive a peak inflow of 812 cfs and release a peak outflow of 375 cfs downstream. The peak flood volume through the basin is 86.96 acre-feet. Additionally, the peak water surface elevation is the basin is 2,478.73 feet, which is below the spillway crest elevation of 2,480 feet and the basin crest elevation of 2,482 feet. The proposed dual 42 inch RCP outflow can convey a 100-year storm flow of 428 cfs with a maximum basin elevation of 2,482 feet; see culvert analysis in Appendix C.4.

Table 3
Ultimate Condition – Basin Routing Analysis
100-Year Storm Event

Node Number	100-Year Storm Duration	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Flood Volume (Acre-Feet)	Peak Water Surface Elevation[1] (Feet)
107	3-Hour	812	375	86.96	2,478.73
	6-Hour	704	373	104.12	2,478.64
	24-Hour	435	343	232.31	2,476.96

[1] The Basin Crest Elevation is 2,482 feet and the Spillway Crest Elevation is 2,480 feet. The basin has a total storage capacity of 53.1 Acre-Feet.

5.5 Proposed Storm Drain Hydraulics

The proposed Project includes three storm drain lines; the Mainline, Line A, and Line B. The Mainline consists of 6 foot x 6 foot RCB, 72 inch RCP, and 78 inch RCP. The Mainline hydraulic model and analysis can be found in Appendix D.1 and D.2, respectively. In addition, the Mainline hydraulic model and analysis was also run in the "no flow split" scenario and the results can be found in Appendix D.3 and D.4, respectively. Storm drain Line A consists of the 54 inch RCP in Calimesa Boulevard and its hydraulic model and analysis can be found in Appendix D.5 and D.6, respectively. Finally, Storm drain Line B consists of the 36 inch RCP low flow outlet and its hydraulic model and analysis can be found in Appendix D.7 and D.8, respectively. As shown in the analysis, all proposed storm drain facilities maintain an hydraulic grade line below the existing and/or proposed ground surface.

5.6 Project Impact

The net effect of the proposed Calimesa Channel "Stage III" is a decrease in the 100-year flow rate from 1,051 cfs in the Existing Condition to 662 cfs in the proposed Ultimate Condition (Exhibit 4, Node 99). The proposed Project with provide the following benefits:

- Reduce peak 100-year flow rate to downstream facilities,
- Reduced storm drain infrastructure costs,
- Eliminating flooding at Park Avenue and Calimesa Boulevard,
- Alleviate flooding along County Line Road and I-10 underpass, and
- Provide flood protection for the Fire Station, City Hall, and DBD.

The proposed Project, the Calimesa Channel "Stage III", is an important component of an ultimate storm drain system. However, in order to convey the 100-year runoff from both the Calimesa Creek watershed and the Avenue L watershed westerly across I-10 Freeway, the existing sump and 6 foot x 6 foot RCB would require additional modifications, replacement, or the construction of an additional drainage facility crossing the freeway as a component of a regional drainage plan. This would involve coordination among Caltrans, the City, the City of Yucaipa, RCFC&WCD, and San Bernardino County Flood Control District. However, the proposed Project has significantly decreased the flooding potential by incorporating a detention basin. The detention basin reduced 100-year flow rates by over 380 cfs.

EXHIBITS

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FAX: (951) 680-0490

CITY OF CALIMESA

CALIMESA CHANNEL STAGE III
VICINITY MAP
EXHIBIT 1

S:\CADD\133-02 Calimesa Creek\Hydrology\Hydrology Report Vicinity Map.dwg

HYDROLOGY STUDY FILE:
CCUH3HE

LEGEND:

- SUB-AREA BOUNDARY
- CALIMESA CHANNEL TRIBUTARY BOUNDARY
- FLOW PATH DIRECTION

HYDROLOGY RESULTS (UNIT HYDROGRAPH):

NODE	TRIB. AREA	$Q_{100Y-3HR}$(cfs)
107	3TD. ST	804.22
105	5TH. ST	1,043.35
99	EAST BAKER'S	1,051.48

N

SCALE: 1" = 500'

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CITY OF CALIMESA

CALIMESA CHANNEL "STAGE III"
HYDROLOGY STUDY EXISTING CONDITION
EXHIBIT 2

S:\CADD\133-02 Calimesa Creek\Hydrology\Hydrology Map-New-Existing.dwg

HYDROLOGY STUDY FILES (FLOW ROUTING):
-CCRRT3
-CCRRT4

LEGEND:

- SUB-AREA BOUNDARY
- CALIMESA CHANNEL TRIBUTARY BOUNDARY
- FLOW PATH DIRECTION
- NODE# / ELEV. — CONCENTRATION POINT
- × — CENTROID LOCATION
- L — LONGEST FROWPATH DISTANCE
- 5 / 18 — AREA NUMBER / ACREAGE
- AREA CENTROID PROJECTION TO A "OPPOSITE" POINT ALONG THE LONGEST WATERCOURSE

HYDROLOGY RESULTS (FLOW ROUTING):

NODE	TRIB. AREA	$Q_{100Y-3HR}$(cfs)
107	3TD. ST	812.44
105	5TH. ST	607.73
99	EAST BAKER'S	662.62

N
SCALE: 1" = 500'

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CITY OF CALIMESA
CALIMESA CHANNEL "STAGE III"
HYDROLOGY STUDY ULTIMATE CONDITION
EXHIBIT 3

S:\CADD\133-02 Calimesa Creek\Hydrology\Hydrology Map-New-Proposed-UH.dwg

NOTES:

* DATA OBTAIN FROM RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (RCFC&WCD) ON HYDROLOLGY REPORT FOR THE CALIMESA – AVENUE L STORM DRAIN PROJECT No. 5-0-0165.

E EXISTING DEVELOP CONDITION

F FULLY DEVELOP CONDITION

LEGEND:

- SUB-AREA BOUNDARY
- CALIMESA CHANNEL TRIBUTARY BOUNDARY
- EXISTING FLOW PATH DIRECTION
- PROPOSED FLOW PATH DIRECTION
- EXISTING 15' WIDE CALIMESA CHANNEL SERVICE ROAD
- SPILLWAY STRUCTURE LOCATION

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CITY OF CALIMESA

CALIMESA CHANNEL "STAGE III"
EXISTING CONDITION VS. ULTIMATE CONDITION
FLOW RATES – EXHIBIT 4

S:\CADD\133-02 Calimesa Creek\Hydrology\Retarding Basin Alt-12 Existing vs Proposed.dwg

APPENDCES

APPENDIX A
EXISTING PHOTOGRAPHS

Figure 1
End of Calimesa Channel "Stage I", looking upstream west of 5th Street

Figure 2
End of Calimesa Channel "Stage I", looking downstream west of 5th Street

Figure 3
54” CMP Culvert inlet, looking downstream east of Park Avenue

Figure 4
54” CMP Culvert outlet, looking upstream west of Park Avenue

Figure 5
54” CMP Culvert outlet and Creek Slope Adjacent to Fire Station, looking downstream at Park Avenue

Figure 6
Existing Creek, looking downstream between Park Avenue and Calimesa Boulevard

Figure 7
6’x6’ RCB Culvert inlet, looking downstream east of Calimesa Boulevard

Figure 8
6’x6’ RCB Culvert outlet, looking upstream west of Calimesa Boulevard

Figure 9
78″ RCP Culvert inlet, looking downstream 50′ east of Baker's Restaurant

Figure 10
78″ RCP Culvert outlet, looking upstream 25′ west of Restaurant Baker's

APPENDIX B
HYDROLOGY STUDY

APPENDIX B.1
CALIMESA CHANNEL HYDROLOGY
EXISTING CONDITION

SYNTETIC UNIT HYDROGRAPH METHOD

```
____________________________________________________________________________
****************************************************************************
  INTEGRATED RATIONAL METHOD/UH METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                      (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2014 Advanced Engineering Software (aes)
                      (Rational Tabling Version 21.0)
                   Release Date: 06/01/2014  License ID 1670

                           Analysis prepared by:

                            TKE Engineering, Inc.
                              2305 Chicago Ave.
                             Riverside, Ca. 92507


 ************************** DESCRIPTION OF STUDY **************************
* CALIMESA CHANNEL                                                          *
* RATIONAL METHOD HYDROLOGY WITH UNIT HYDROGRAPH COMBINED OPTION            *
* 100YR-3HR EXISTING CONDITION  MAY 2018  (FILE CCUH3HE)                    *
 **************************************************************************

  FILE NAME: CCUH3HE.DAT
  TIME/DATE OF STUDY: 10:15 04/13/2018
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  2-YEAR, 1-HOUR PRECIPITATION(INCH) =  0.575
  100-YEAR, 1-HOUR PRECIPITATION(INCH) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.350
  SLOPE OF INTENSITY DURATION CURVE = 0.5500
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.020/0.020/0.025   0.67    2.00 0.0313 0.167 0.0150
  2   22.0     12.0    0.020/0.020/0.025   0.67    2.00 0.0313 0.167 0.0150
  3   32.0     12.0    0.020/0.020/0.025   0.67    2.00 0.0313 0.167 0.0150
  4   18.0     12.0    0.020/0.020/0.025   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.20 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    VALLEY S-GRAPH USED.
    RIVERSIDE COUNTY DEPTH-AREA FACTORS USED (See Page B-3.)
    * 3-HOUR ( 5-MINUTE PERIOD) DESIGN STORM USED.
    UNADJUSTED  3-HOUR RAINFALL DEPTH (INCHES) =   2.25
    LOW LOSS RATE PERCENTAGE =  0.85
  *PRECIPITATION ZONE NUMBER (PZN) = 3.0
```

```
   *ANTECEDENT MOISTURE CONDITION (AMC) =  0.00 ASSUMED FOR UNIT HYDROGRAPH
METHOD*


 ****************************************************************************
   FLOW PROCESS FROM NODE   1607.00 TO NODE   1606.00 IS CODE =  21
 ----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   552.00
   UPSTREAM ELEVATION(FEET) =   2668.00
   DOWNSTREAM ELEVATION(FEET) =   2648.00
   ELEVATION DIFFERENCE(FEET) =    20.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.715
   SUBAREA Tc AND LOSS RATE DATA(AMC III):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
        LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
   RESIDENTIAL
   "S.F. 1/4 ACRE LOT"        B        2.90     0.8010       56    9.53
   SUBAREA RUNOFF(CFS) =      8.63
   TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      8.63

 ****************************************************************************
   FLOW PROCESS FROM NODE   1606.00 TO NODE   1606.00 IS CODE =  81
 ----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ============================================================================
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.715
   SUBAREA Tc AND LOSS RATE DATA(AMC III):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
        LAND USE            GROUP   (ACRES)   Coefficient    CN
   NATURAL POOR COVER
   "BARREN"                   B        2.00     0.7020       70
   SUBAREA AREA(ACRES) =    2.00   SUBAREA RUNOFF(CFS) =    5.22
   TOTAL AREA(ACRES) =        4.9   TOTAL RUNOFF(CFS) =      13.84
   TC(MIN.) =    9.53

 ****************************************************************************
   FLOW PROCESS FROM NODE   1606.00 TO NODE   1605.00 IS CODE =  51
 ----------------------------------------------------------------------------
   >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
   >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
 ============================================================================
   ELEVATION DATA: UPSTREAM(FEET) =   2648.00  DOWNSTREAM(FEET) =   2640.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   251.00   CHANNEL SLOPE =  0.0319
   CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
   MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.599
   SUBAREA Tc AND LOSS RATE DATA(AMC III):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
        LAND USE            GROUP   (ACRES)   Coefficient    CN
   RESIDENTIAL
   "S.F. 1/4 ACRE LOT"        B        2.70     0.7985       56
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.72
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
   AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   0.56
   Tc(MIN.) =   10.09
   SUBAREA AREA(ACRES) =     2.70       SUBAREA RUNOFF(CFS) =    7.76
   TOTAL AREA(ACRES) =        7.6         PEAK FLOW RATE(CFS) =      21.60

   END OF SUBAREA CHANNEL FLOW HYDRAULICS:
   DEPTH(FEET) =  0.59   FLOW VELOCITY(FEET/SEC.) =   7.75
```

```
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1605.00 =     803.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1605.00 TO NODE   1605.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.599
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.20     0.6971       70
  SUBAREA AREA(ACRES) =    2.20   SUBAREA RUNOFF(CFS) =    5.52
  TOTAL AREA(ACRES) =        9.8   TOTAL RUNOFF(CFS) =      27.12
  TC(MIN.) =   10.09

****************************************************************************
  FLOW PROCESS FROM NODE   1605.00 TO NODE   1604.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2640.00  DOWNSTREAM(FEET) =  2636.00
  FLOW LENGTH(FEET) =    95.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.11
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.12
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1604.00 =     898.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1604.00 TO NODE   1603.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2636.00  DOWNSTREAM ELEVATION(FEET) = 2630.00
  STREET LENGTH(FEET) =   156.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.10
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.52   FLOOD WIDTH(FEET) =   18.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    6.30
    SPLIT DEPTH(FEET) =    0.37   SPLIT FLOOD WIDTH(FEET) =   10.83
    SPLIT FLOW(CFS) =    6.48   SPLIT VELOCITY(FEET/SEC.) =    4.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.27
  STREET FLOW TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =   10.61
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.70     0.7963       56
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    1.95
  TOTAL AREA(ACRES) =       10.5        PEAK FLOW RATE(CFS) =      29.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.30   DEPTH*VELOCITY(FT*FT/SEC.) =   3.27
  LONGEST FLOWPATH FROM NODE   1607.00 TO NODE   1603.00 =    1054.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1603.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.61
  RAINFALL INTENSITY(INCH/HR) =   3.50
  TOTAL STREAM AREA(ACRES) =    10.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.07

****************************************************************************
  FLOW PROCESS FROM NODE   1701.00 TO NODE   1700.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   605.00
  UPSTREAM ELEVATION(FEET) =   2660.00
  DOWNSTREAM ELEVATION(FEET) =   2636.00
  ELEVATION DIFFERENCE(FEET) =     24.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.677
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.20     0.8002       56    9.70
  SUBAREA RUNOFF(CFS) =      9.42
  TOTAL AREA(ACRES) =      3.20   TOTAL RUNOFF(CFS) =      9.42

****************************************************************************
  FLOW PROCESS FROM NODE   1700.00 TO NODE   1700.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.677
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.30     0.7004       70
  SUBAREA AREA(ACRES) =    1.30   SUBAREA RUNOFF(CFS) =    3.35
  TOTAL AREA(ACRES) =        4.5   TOTAL RUNOFF(CFS) =      12.76
  TC(MIN.) =    9.70

****************************************************************************
  FLOW PROCESS FROM NODE   1700.00 TO NODE   1603.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2636.00  DOWNSTREAM ELEVATION(FEET) = 2630.00
  STREET LENGTH(FEET) =   614.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   16.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.06
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
  STREET FLOW TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =   13.05
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.124
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.50     0.7870       56
  SUBAREA AREA(ACRES) =    4.50      SUBAREA RUNOFF(CFS) =   11.07
  TOTAL AREA(ACRES) =        9.0        PEAK FLOW RATE(CFS) =      23.83

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  3.29   DEPTH*VELOCITY(FT*FT/SEC.) =   1.74
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1603.00 =    1219.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1603.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.05
  RAINFALL INTENSITY(INCH/HR) =   3.12
  TOTAL STREAM AREA(ACRES) =     9.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     23.83

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       29.07    10.61        3.500         10.50
      2       23.83    13.05        3.124          9.00

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.
```

```
  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       48.46    10.61       3.500
      2       49.78    13.05       3.124

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.46   Tc(MIN.) =   10.61
  TOTAL AREA(ACRES) =       19.5
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1603.00 =    1219.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1603.00 TO NODE   1602.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2630.00  DOWNSTREAM ELEVATION(FEET) = 2617.00
  STREET LENGTH(FEET) =   994.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.67
    HALFSTREET FLOOD WIDTH(FEET) =   25.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.02
  STREET FLOW TRAVEL TIME(MIN.) =   3.66   Tc(MIN.) =   14.27
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.974
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       10.00     0.7828       56
  SUBAREA AREA(ACRES) =   10.00      SUBAREA RUNOFF(CFS) =   23.28
  TOTAL AREA(ACRES) =       29.5        PEAK FLOW RATE(CFS) =      71.74

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  28.57
  FLOW VELOCITY(FEET/SEC.) =  4.72   DEPTH*VELOCITY(FT*FT/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1602.00 =    2213.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1602.00 TO NODE   1601.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2617.00  DOWNSTREAM ELEVATION(FEET) = 2610.00
  STREET LENGTH(FEET) =   612.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      82.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   32.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.62
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.44
  STREET FLOW TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =   16.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.748
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       10.00     0.7758       56
  SUBAREA AREA(ACRES) =   10.00      SUBAREA RUNOFF(CFS) =   21.32
  TOTAL AREA(ACRES) =       39.5        PEAK FLOW RATE(CFS) =      93.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  34.99
  FLOW VELOCITY(FEET/SEC.) =  4.72   DEPTH*VELOCITY(FT*FT/SEC.) =   3.65
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1601.00 =    2825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1601.00 TO NODE   1600.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2610.00  DOWNSTREAM ELEVATION(FEET) = 2608.00
  STREET LENGTH(FEET) =   453.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     109.00
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.91
    HALFSTREET FLOOD WIDTH(FEET) =   41.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
  STREET FLOW TRAVEL TIME(MIN.) =   2.13   Tc(MIN.) =   18.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.571
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       16.10     0.7697       56
  SUBAREA AREA(ACRES) =   16.10      SUBAREA RUNOFF(CFS) =   31.85
  TOTAL AREA(ACRES) =       55.6        PEAK FLOW RATE(CFS) =     124.91

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 0.95   HALFSTREET FLOOD WIDTH(FEET) =  43.29
  FLOW VELOCITY(FEET/SEC.) =  3.71   DEPTH*VELOCITY(FT*FT/SEC.) =   3.52
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  453.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   38.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   1600.00
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE   1600.00 =    3278.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1600.00 TO NODE   1600.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.571
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.40     0.6394       70
  SUBAREA AREA(ACRES) =    1.40   SUBAREA RUNOFF(CFS) =    2.30
  TOTAL AREA(ACRES) =       57.0   TOTAL RUNOFF(CFS) =     127.21
  TC(MIN.) =   18.60

****************************************************************************
  FLOW PROCESS FROM NODE   1600.00 TO NODE    115.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2608.00  DOWNSTREAM(FEET) =  2607.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.00
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     127.21
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   18.63
  LONGEST FLOWPATH FROM NODE   1701.00 TO NODE    115.00 =    3308.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   1806.00 TO NODE   1805.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   983.00
  UPSTREAM ELEVATION(FEET) =   2862.00
  DOWNSTREAM ELEVATION(FEET) =   2841.00
  ELEVATION DIFFERENCE(FEET) =     21.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.087
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.20     0.7860       56   13.34
  SUBAREA RUNOFF(CFS) =      5.34
  TOTAL AREA(ACRES) =      2.20   TOTAL RUNOFF(CFS) =      5.34

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   1805.00 TO NODE   1804.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2841.00  DOWNSTREAM ELEVATION(FEET) = 2832.00
  STREET LENGTH(FEET) =   168.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.33
    HALFSTREET FLOOD WIDTH(FEET) =    8.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.56   Tc(MIN.) =   13.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.019
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.30     0.7841       56
  SUBAREA AREA(ACRES) =    3.30      SUBAREA RUNOFF(CFS) =    7.81
  TOTAL AREA(ACRES) =        5.5        PEAK FLOW RATE(CFS) =      13.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  10.12
  FLOW VELOCITY(FEET/SEC.) =  5.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.95
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1804.00 =    1151.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1804.00 TO NODE   1804.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.89
  RAINFALL INTENSITY(INCH/HR) =   3.02
  TOTAL STREAM AREA(ACRES) =     5.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.15

****************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   344.00
  UPSTREAM ELEVATION(FEET) =   2865.00
  DOWNSTREAM ELEVATION(FEET) =   2864.00
  ELEVATION DIFFERENCE(FEET) =      1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.123
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
RESIDENTIAL
"S.F. 1/4 ACRE LOT"        B       1.70     0.7870       56   13.06
SUBAREA RUNOFF(CFS) =      4.18
TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      4.18

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2000.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2864.00  DOWNSTREAM ELEVATION(FEET) = 2860.00
  STREET LENGTH(FEET) =   153.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.63
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =    9.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.26
  STREET FLOW TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   13.75
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.035
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       2.90     0.7845       56
  SUBAREA AREA(ACRES) =    2.90      SUBAREA RUNOFF(CFS) =    6.91
  TOTAL AREA(ACRES) =        4.6        PEAK FLOW RATE(CFS) =      11.08

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  11.02
  FLOW VELOCITY(FEET/SEC.) =  3.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.50
  LONGEST FLOWPATH FROM NODE   2002.00 TO NODE   2000.00 =     497.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   1804.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2860.00  DOWNSTREAM(FEET) =  2832.00
  FLOW LENGTH(FEET) =   609.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.72
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.08
  PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =   14.62
  LONGEST FLOWPATH FROM NODE   2002.00 TO NODE   1804.00 =    1106.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1804.00 TO NODE   1804.00 IS CODE =   1
```

```
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.62
  RAINFALL INTENSITY(INCH/HR) =   2.93
  TOTAL STREAM AREA(ACRES) =    4.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.08

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        13.15    13.89        3.019          5.50
     2        11.08    14.62        2.935          4.60

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        23.68    13.89       3.019
     2        23.87    14.62       2.935

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.68   Tc(MIN.) =   13.89
  TOTAL AREA(ACRES) =       10.1
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1804.00 =    1151.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1804.00 TO NODE   1803.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) = 2832.00  DOWNSTREAM ELEVATION(FEET) = 2807.00
  STREET LENGTH(FEET) =   813.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.90
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   15.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.52
  STREET FLOW TRAVEL TIME(MIN.) =   2.57   Tc(MIN.) =   16.46
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.749
```

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  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.90     0.7758       56
  SUBAREA AREA(ACRES) =    4.90      SUBAREA RUNOFF(CFS) =   10.45
  TOTAL AREA(ACRES) =       15.0        PEAK FLOW RATE(CFS) =      34.13

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  17.15
  FLOW VELOCITY(FEET/SEC.) =  5.45   DEPTH*VELOCITY(FT*FT/SEC.) =   2.73
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1803.00 =    1964.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1803.00 TO NODE   1803.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.46
  RAINFALL INTENSITY(INCH/HR) =   2.75
  TOTAL STREAM AREA(ACRES) =    15.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.13

****************************************************************************
  FLOW PROCESS FROM NODE   1902.00 TO NODE   1901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   797.00
  UPSTREAM ELEVATION(FEET) =   2873.00
  DOWNSTREAM ELEVATION(FEET) =   2853.00
  ELEVATION DIFFERENCE(FEET) =     20.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.291
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.50     0.7913       56   11.87
  SUBAREA RUNOFF(CFS) =      9.11
  TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =      9.11

****************************************************************************
  FLOW PROCESS FROM NODE   1901.00 TO NODE   1900.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2853.00  DOWNSTREAM ELEVATION(FEET) = 2826.00
  STREET LENGTH(FEET) =   420.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.41
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.35
    HALFSTREET FLOOD WIDTH(FEET) =    9.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.07
  STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   13.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.121
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.50     0.7869       56
  SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    8.60
  TOTAL AREA(ACRES) =        7.0        PEAK FLOW RATE(CFS) =      17.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  11.11
  FLOW VELOCITY(FEET/SEC.) =  6.22   DEPTH*VELOCITY(FT*FT/SEC.) =   2.37
  LONGEST FLOWPATH FROM NODE   1902.00 TO NODE   1900.00 =    1217.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1900.00 TO NODE   1803.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2826.00  DOWNSTREAM ELEVATION(FEET) = 2807.00
  STREET LENGTH(FEET) =   515.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   14.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.48
  STREET FLOW TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =   14.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.933
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.20     0.7816       56
  SUBAREA AREA(ACRES) =    7.20      SUBAREA RUNOFF(CFS) =   16.50
  TOTAL AREA(ACRES) =       14.2        PEAK FLOW RATE(CFS) =      34.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  16.55
  FLOW VELOCITY(FEET/SEC.) =  5.84   DEPTH*VELOCITY(FT*FT/SEC.) =   2.86
  LONGEST FLOWPATH FROM NODE   1902.00 TO NODE   1803.00 =    1732.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1803.00 TO NODE   1803.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.64
  RAINFALL INTENSITY(INCH/HR) =   2.93
  TOTAL STREAM AREA(ACRES) =    14.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.21

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       34.13    16.46        2.749         15.00
      2       34.21    14.64        2.933         14.20

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       64.57    14.64       2.933
      2       66.21    16.46       2.749

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      64.57   Tc(MIN.) =   14.64
  TOTAL AREA(ACRES) =       29.2
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1803.00 =    1964.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1803.00 TO NODE   1802.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2807.00  DOWNSTREAM ELEVATION(FEET) = 2754.00
  STREET LENGTH(FEET) =  1321.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.31
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    7.28
    SPLIT DEPTH(FEET) =    0.59   SPLIT FLOOD WIDTH(FEET) =   21.58
    SPLIT FLOW(CFS) =   34.70   SPLIT VELOCITY(FEET/SEC.) =    7.16
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  STREET FLOW TRAVEL TIME(MIN.) =   3.02   Tc(MIN.) =   17.67
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.645
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        6.60     0.7723       56
  SUBAREA AREA(ACRES) =    6.60      SUBAREA RUNOFF(CFS) =   13.48
  TOTAL AREA(ACRES) =       35.8        PEAK FLOW RATE(CFS) =      78.05

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  7.46   DEPTH*VELOCITY(FT*FT/SEC.) =   4.53
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1802.00 =    3285.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1802.00 TO NODE   1802.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.645
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        3.80     0.6447       70
  SUBAREA AREA(ACRES) =    3.80   SUBAREA RUNOFF(CFS) =    6.48
  TOTAL AREA(ACRES) =       39.6   TOTAL RUNOFF(CFS) =      84.53
  TC(MIN.) =   17.67

****************************************************************************
  FLOW PROCESS FROM NODE   1802.00 TO NODE   1801.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2754.00  DOWNSTREAM ELEVATION(FEET) = 2701.00
  STREET LENGTH(FEET) =  1340.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      94.33
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.11
  STREET FLOW TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   20.45
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.440
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
```

```
  "S.F. 1/4 ACRE LOT"        B       10.50     0.7648       56
  SUBAREA AREA(ACRES) =   10.50      SUBAREA RUNOFF(CFS) =   19.60
  TOTAL AREA(ACRES) =       50.1        PEAK FLOW RATE(CFS) =     104.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  8.33   DEPTH*VELOCITY(FT*FT/SEC.) =   5.44
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1801.00 =    4625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1801.00 TO NODE   1801.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.440
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                  B        5.00     0.6297       70
  SUBAREA AREA(ACRES) =    5.00   SUBAREA RUNOFF(CFS) =    7.68
  TOTAL AREA(ACRES) =       55.1   TOTAL RUNOFF(CFS) =     111.81
  TC(MIN.) =   20.45

****************************************************************************
  FLOW PROCESS FROM NODE   1801.00 TO NODE   1800.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2701.00  DOWNSTREAM ELEVATION(FEET) = 2629.00
  STREET LENGTH(FEET) =  2048.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     125.54
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   23.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.04
  STREET FLOW TRAVEL TIME(MIN.) =   3.95   Tc(MIN.) =   24.40
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.214
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       16.40     0.7555       56
  SUBAREA AREA(ACRES) =   16.40      SUBAREA RUNOFF(CFS) =   27.44
  TOTAL AREA(ACRES) =       71.5        PEAK FLOW RATE(CFS) =     139.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  24.12
  FLOW VELOCITY(FEET/SEC.) =  8.97   DEPTH*VELOCITY(FT*FT/SEC.) =   6.46
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE   1800.00 =    6673.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1800.00 TO NODE    116.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2629.00  DOWNSTREAM(FEET) =  2623.00
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  44.45
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     139.24
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   24.41
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    116.00 =    6693.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    116.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2309.00 TO NODE   2308.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   372.00
  UPSTREAM ELEVATION(FEET) =   2813.00
  DOWNSTREAM ELEVATION(FEET) =   2799.00
  ELEVATION DIFFERENCE(FEET) =     14.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B       2.60     0.7859       56    8.68
  SUBAREA RUNOFF(CFS) =      7.99
  TOTAL AREA(ACRES) =      2.60   TOTAL RUNOFF(CFS) =      7.99

****************************************************************************
  FLOW PROCESS FROM NODE   2308.00 TO NODE   2307.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2799.00  DOWNSTREAM(FEET) =   2796.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   192.00   CHANNEL SLOPE =  0.0156
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.763
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B       2.60     0.7824       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.82
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.12
  AVERAGE FLOW DEPTH(FEET) =   0.54   TRAVEL TIME(MIN.) =   0.62
  Tc(MIN.) =    9.30
  SUBAREA AREA(ACRES) =     2.60      SUBAREA RUNOFF(CFS) =    7.65
  TOTAL AREA(ACRES) =        5.2        PEAK FLOW RATE(CFS) =      15.64
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOW VELOCITY(FEET/SEC.) =   5.47
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2307.00 =     564.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2307.00 TO NODE   2306.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2796.00  DOWNSTREAM(FEET) =   2795.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   218.00   CHANNEL SLOPE =  0.0046
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.567
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        5.30     0.7774       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.83
  AVERAGE FLOW DEPTH(FEET) =   0.87   TRAVEL TIME(MIN.) =   0.95
  Tc(MIN.) =   10.25
  SUBAREA AREA(ACRES) =     5.30       SUBAREA RUNOFF(CFS) =  14.70
  TOTAL AREA(ACRES) =       10.5         PEAK FLOW RATE(CFS) =      30.34

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.96   FLOW VELOCITY(FEET/SEC.) =   4.08
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2306.00 =     782.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2306.00 TO NODE   2305.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2795.00  DOWNSTREAM ELEVATION(FEET) = 2765.00
  STREET LENGTH(FEET) =   562.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.15
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   15.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.27
  STREET FLOW TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =   11.62
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.330
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        5.30     0.7708       56
```

```
  SUBAREA AREA(ACRES) =    5.30      SUBAREA RUNOFF(CFS) =   13.60
  TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      43.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.98
  FLOW VELOCITY(FEET/SEC.) =  7.15   DEPTH*VELOCITY(FT*FT/SEC.) =   3.56
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2305.00 =    1344.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2305.00 TO NODE   2304.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  2765.00
  DOWNSTREAM NODE ELEVATION(FEET) =  2761.00
  FLOW LENGTH(FEET) =   643.00   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.23
  PIPE-FLOW(CFS) =      16.45
  PIPEFLOW TRAVEL TIME(MIN.) =   2.05    Tc(MIN.) =  13.67
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.046
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.80     0.7848       56
  SUBAREA AREA(ACRES) =    3.80      SUBAREA RUNOFF(CFS) =    9.08
  TOTAL AREA(ACRES) =       19.6        PEAK FLOW RATE(CFS) =      53.03

  STREET CROSS-SECTION INFORMATION:
  CURB HEIGHT(INCHES) =  8.0       STREET HALFWIDTH(FEET) = 22.00
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.87
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   36.58
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.00
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2304.00 =    1987.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2304.00 TO NODE   2304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.046
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        1.50     0.7618       56
  SUBAREA AREA(ACRES) =    1.50   SUBAREA RUNOFF(CFS) =    3.48
```

```
  TOTAL AREA(ACRES) =       21.1   TOTAL RUNOFF(CFS) =      56.51
  TC(MIN.) =   13.67

****************************************************************************
  FLOW PROCESS FROM NODE   2304.00 TO NODE   2304.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.67
  RAINFALL INTENSITY(INCH/HR) =   3.05
  TOTAL STREAM AREA(ACRES) =    21.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     56.51

****************************************************************************
  FLOW PROCESS FROM NODE   2602.00 TO NODE   2601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   506.00
  UPSTREAM ELEVATION(FEET) =   2822.00
  DOWNSTREAM ELEVATION(FEET) =   2799.00
  ELEVATION DIFFERENCE(FEET) =    23.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.882
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.00     0.8044       56    8.79
  SUBAREA RUNOFF(CFS) =      9.37
  TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      9.37

****************************************************************************
  FLOW PROCESS FROM NODE   2601.00 TO NODE   2600.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2799.00  DOWNSTREAM ELEVATION(FEET) = 2783.00
  STREET LENGTH(FEET) =   362.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.71
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   10.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.90
  STREET FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =    9.97
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.622
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
```

```
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        B        3.00     0.7990       56
 SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    8.68
 TOTAL AREA(ACRES) =        6.0        PEAK FLOW RATE(CFS) =      18.05

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  12.14
 FLOW VELOCITY(FEET/SEC.) =  5.43   DEPTH*VELOCITY(FT*FT/SEC.) =   2.18
 LONGEST FLOWPATH FROM NODE   2602.00 TO NODE   2600.00 =     868.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2600.00 TO NODE   2304.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2783.00  DOWNSTREAM ELEVATION(FEET) = 2761.00
 STREET LENGTH(FEET) =   617.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.14
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   14.86
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.48
 STREET FLOW TRAVEL TIME(MIN.) =   1.89   Tc(MIN.) =   11.86
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.293
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        B        6.20     0.7914       56
 SUBAREA AREA(ACRES) =    6.20      SUBAREA RUNOFF(CFS) =   16.16
 TOTAL AREA(ACRES) =       12.2        PEAK FLOW RATE(CFS) =      34.21

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  16.64
 FLOW VELOCITY(FEET/SEC.) =  5.78   DEPTH*VELOCITY(FT*FT/SEC.) =   2.84
 LONGEST FLOWPATH FROM NODE   2602.00 TO NODE   2304.00 =    1485.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2304.00 TO NODE   2304.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.86
 RAINFALL INTENSITY(INCH/HR) =   3.29
 TOTAL STREAM AREA(ACRES) =    12.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     34.21
```

```
 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       56.51    13.67        3.046         21.10
     2       34.21    11.86        3.293         12.20

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1       83.24    11.86       3.293
     2       88.15    13.67       3.046

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      88.15   Tc(MIN.) =   13.67
 TOTAL AREA(ACRES) =       33.3
 LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2304.00 =    1987.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2304.00 TO NODE   2303.00 IS CODE =  33
----------------------------------------------------------------------------
 >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =  2761.00
 DOWNSTREAM NODE ELEVATION(FEET) =  2758.00
 FLOW LENGTH(FEET) =   206.00   MANNING'S N =  0.013

 USER SPECIFIED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.00
 PIPE-FLOW(CFS) =      25.17
 PIPEFLOW TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =  14.10
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.994
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        B        0.30     0.7834       56
 SUBAREA AREA(ACRES) =    0.30      SUBAREA RUNOFF(CFS) =    0.70
 TOTAL AREA(ACRES) =       33.6        PEAK FLOW RATE(CFS) =      88.85

 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT(INCHES) =  8.0       STREET HALFWIDTH(FEET) = 22.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.86
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   63.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.32
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2303.00 =    2193.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2303.00 TO NODE   2303.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.10
  RAINFALL INTENSITY(INCH/HR) =   2.99
  TOTAL STREAM AREA(ACRES) =    33.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     88.85

****************************************************************************
  FLOW PROCESS FROM NODE   2504.00 TO NODE   2503.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   351.00
  UPSTREAM ELEVATION(FEET) =   2825.00
  DOWNSTREAM ELEVATION(FEET) =   2813.00
  ELEVATION DIFFERENCE(FEET) =     12.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.078
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.60     0.8080       56    8.04
  SUBAREA RUNOFF(CFS) =     11.86
  TOTAL AREA(ACRES) =      3.60   TOTAL RUNOFF(CFS) =     11.86

****************************************************************************
  FLOW PROCESS FROM NODE   2503.00 TO NODE   2502.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2813.00  DOWNSTREAM ELEVATION(FEET) = 2800.00
  STREET LENGTH(FEET) =   278.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.45
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   11.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.16
  STREET FLOW TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =    8.89
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.859
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.60     0.8039       56
  SUBAREA AREA(ACRES) =    3.60      SUBAREA RUNOFF(CFS) =   11.17
  TOTAL AREA(ACRES) =        7.2        PEAK FLOW RATE(CFS) =      23.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  13.36
  FLOW VELOCITY(FEET/SEC.) =  5.83   DEPTH*VELOCITY(FT*FT/SEC.) =   2.48
  LONGEST FLOWPATH FROM NODE   2504.00 TO NODE   2502.00 =     629.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2502.00 TO NODE   2501.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2800.00  DOWNSTREAM ELEVATION(FEET) = 2783.00
  STREET LENGTH(FEET) =   434.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.81
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   16.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.88
  STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   10.10
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.597
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.50     0.7985       56
  SUBAREA AREA(ACRES) =    7.50      SUBAREA RUNOFF(CFS) =   21.54
  TOTAL AREA(ACRES) =       14.7        PEAK FLOW RATE(CFS) =      44.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.40   DEPTH*VELOCITY(FT*FT/SEC.) =   3.33
  LONGEST FLOWPATH FROM NODE   2504.00 TO NODE   2501.00 =    1063.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2501.00 TO NODE   2500.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2783.00  DOWNSTREAM ELEVATION(FEET) = 2759.00
  STREET LENGTH(FEET) =   675.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.40
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =   11.77
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.307
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.50     0.7917       56
  SUBAREA AREA(ACRES) =    7.50      SUBAREA RUNOFF(CFS) =   19.63
  TOTAL AREA(ACRES) =       22.2        PEAK FLOW RATE(CFS) =      64.20

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  7.21   DEPTH*VELOCITY(FT*FT/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE   2504.00 TO NODE   2500.00 =    1738.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2500.00 TO NODE   2303.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2759.00  DOWNSTREAM(FEET) =  2752.00
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.96
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      64.20
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   11.80
  LONGEST FLOWPATH FROM NODE   2504.00 TO NODE   2303.00 =    1783.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2303.00 TO NODE   2303.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.80
  RAINFALL INTENSITY(INCH/HR) =   3.30
  TOTAL STREAM AREA(ACRES) =    22.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     64.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       88.85    14.10        2.994         33.60
      2       64.20    11.80        3.303         22.20
```

```
*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      138.56    11.80       3.303
     2      147.07    14.10       2.994

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     147.07   Tc(MIN.) =   14.10
 TOTAL AREA(ACRES) =       55.8
 LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2303.00 =    2193.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2303.00 TO NODE   2302.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2752.00  DOWNSTREAM(FEET) =  2750.00
  FLOW LENGTH(FEET) =    39.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.34
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     147.07
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   14.12
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2302.00 =    2232.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2302.00 TO NODE   2301.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2750.00  DOWNSTREAM(FEET) =   2718.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   677.00   CHANNEL SLOPE =  0.0473
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   7.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.869
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.60     0.7796       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     149.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.18
  AVERAGE FLOW DEPTH(FEET) =   2.62   TRAVEL TIME(MIN.) =   1.11
  Tc(MIN.) =   15.23
  SUBAREA AREA(ACRES) =     2.60       SUBAREA RUNOFF(CFS) =    5.82
  TOTAL AREA(ACRES) =       58.4         PEAK FLOW RATE(CFS) =     152.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  2.64   FLOW VELOCITY(FEET/SEC.) =  10.24
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2301.00 =    2909.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2301.00 TO NODE   2300.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2718.00  DOWNSTREAM(FEET) =  2700.00
  FLOW LENGTH(FEET) =   473.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.09
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     152.88
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   15.61
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2300.00 =    3382.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE   2300.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.61
  RAINFALL INTENSITY(INCH/HR) =   2.83
  TOTAL STREAM AREA(ACRES) =    58.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    152.88

****************************************************************************
  FLOW PROCESS FROM NODE   2403.00 TO NODE   2402.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  UPSTREAM ELEVATION(FEET) =   2762.00
  DOWNSTREAM ELEVATION(FEET) =   2743.00
  ELEVATION DIFFERENCE(FEET) =     19.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.242
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       4.30     0.8109       56    7.48
  SUBAREA RUNOFF(CFS) =     14.79
  TOTAL AREA(ACRES) =      4.30   TOTAL RUNOFF(CFS) =     14.79

****************************************************************************
  FLOW PROCESS FROM NODE   2402.00 TO NODE   2401.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2743.00  DOWNSTREAM ELEVATION(FEET) = 2730.00
  STREET LENGTH(FEET) =   292.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   13.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.38
  STREET FLOW TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =    8.35
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.995
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.30     0.8065       56
  SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =   13.85
  TOTAL AREA(ACRES) =        8.6        PEAK FLOW RATE(CFS) =      28.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  14.77
  FLOW VELOCITY(FEET/SEC.) =  6.04   DEPTH*VELOCITY(FT*FT/SEC.) =   2.74
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2401.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2401.00 TO NODE   2400.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2730.00  DOWNSTREAM ELEVATION(FEET) = 2708.00
  STREET LENGTH(FEET) =   766.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.67
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.62
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.97
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   10.62
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        8.60     0.7963       56
  SUBAREA AREA(ACRES) =    8.60      SUBAREA RUNOFF(CFS) =   23.97
  TOTAL AREA(ACRES) =       17.2        PEAK FLOW RATE(CFS) =      52.61

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.25   DEPTH*VELOCITY(FT*FT/SEC.) =   3.51
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2400.00 =    1421.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE   2400.00 TO NODE   2300.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2708.00  DOWNSTREAM(FEET) =  2700.00
  FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.26
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.61
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   10.65
  LONGEST FLOWPATH FROM NODE   2403.00 TO NODE   2300.00 =    1472.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE   2300.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.65
  RAINFALL INTENSITY(INCH/HR) =   3.49
  TOTAL STREAM AREA(ACRES) =    17.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.61

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      152.88    15.61        2.831         58.40
      2       52.61    10.65        3.494         17.20

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      156.92    10.65       3.494
      2      195.52    15.61       2.831

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     195.52   Tc(MIN.) =   15.61
  TOTAL AREA(ACRES) =       75.6
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE   2300.00 =    3382.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE    120.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2700.00  DOWNSTREAM(FEET) =  2663.00
  FLOW LENGTH(FEET) =  1129.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  35.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.82
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =     195.52
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =   16.51
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    120.00 =    4511.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    128.00 TO NODE    127.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   417.00
  UPSTREAM ELEVATION(FEET) =   2771.00
  DOWNSTREAM ELEVATION(FEET) =   2756.00
  ELEVATION DIFFERENCE(FEET) =     15.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.948
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.70     0.8056       56    8.53
  SUBAREA RUNOFF(CFS) =      8.59
  TOTAL AREA(ACRES) =      2.70   TOTAL RUNOFF(CFS) =      8.59

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    126.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2756.00  DOWNSTREAM(FEET) =   2738.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   336.00   CHANNEL SLOPE =  0.0536
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.786
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.70     0.8025       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.28
  AVERAGE FLOW DEPTH(FEET) =   0.44   TRAVEL TIME(MIN.) =   0.68
  Tc(MIN.) =    9.20
  SUBAREA AREA(ACRES) =     2.70       SUBAREA RUNOFF(CFS) =    8.20
  TOTAL AREA(ACRES) =        5.4         PEAK FLOW RATE(CFS) =      16.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.49   FLOW VELOCITY(FEET/SEC.) =   8.91
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    126.00 =     753.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    125.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2738.00  DOWNSTREAM ELEVATION(FEET) = 2732.00
```

```
  STREET LENGTH(FEET) =   365.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.60
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   16.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.90
  STREET FLOW TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   10.76
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.473
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.20     0.7957       56
  SUBAREA AREA(ACRES) =    4.20      SUBAREA RUNOFF(CFS) =   11.61
  TOTAL AREA(ACRES) =        9.6        PEAK FLOW RATE(CFS) =      28.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.13   DEPTH*VELOCITY(FT*FT/SEC.) =   2.14
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    125.00 =    1118.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    125.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.473
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.20     0.6914       70
  SUBAREA AREA(ACRES) =    1.20   SUBAREA RUNOFF(CFS) =    2.88
  TOTAL AREA(ACRES) =       10.8   TOTAL RUNOFF(CFS) =      31.28
  TC(MIN.) =   10.76

****************************************************************************
  FLOW PROCESS FROM NODE    125.00 TO NODE    124.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2732.00  DOWNSTREAM(FEET) =   2719.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   357.00   CHANNEL SLOPE =  0.0364
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.365
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.30     0.7932       56
```

```
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.33
  AVERAGE FLOW DEPTH(FEET) =   0.69   TRAVEL TIME(MIN.) =   0.64
  Tc(MIN.) =   11.40
  SUBAREA AREA(ACRES) =     3.30       SUBAREA RUNOFF(CFS) =    8.81
  TOTAL AREA(ACRES) =       14.1         PEAK FLOW RATE(CFS) =      40.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOW VELOCITY(FEET/SEC.) =   9.61
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    124.00 =    1475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    124.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.365
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.10     0.6863       70
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    4.85
  TOTAL AREA(ACRES) =       16.2   TOTAL RUNOFF(CFS) =      44.94
  TC(MIN.) =   11.40

****************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    123.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2719.00  DOWNSTREAM ELEVATION(FEET) = 2705.00
  STREET LENGTH(FEET) =   456.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      51.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.40
  STREET FLOW TRAVEL TIME(MIN.) =   1.26   Tc(MIN.) =   12.66
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.177
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        5.50     0.7884       56
  SUBAREA AREA(ACRES) =    5.50      SUBAREA RUNOFF(CFS) =   13.77
  TOTAL AREA(ACRES) =       21.7        PEAK FLOW RATE(CFS) =      58.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  21.30
  FLOW VELOCITY(FEET/SEC.) =  6.21   DEPTH*VELOCITY(FT*FT/SEC.) =   3.63
```

```
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    123.00 =    1931.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    122.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2705.00  DOWNSTREAM(FEET) =  2699.00
  FLOW LENGTH(FEET) =    73.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.69
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      58.71
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   12.72
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    122.00 =    2004.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    121.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2699.00  DOWNSTREAM(FEET) =   2676.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.00   CHANNEL SLOPE =  0.0369
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.979
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.40     0.7829       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.89
  AVERAGE FLOW DEPTH(FEET) =   1.41   TRAVEL TIME(MIN.) =   1.51
  Tc(MIN.) =   14.23
  SUBAREA AREA(ACRES) =     0.40       SUBAREA RUNOFF(CFS) =    0.93
  TOTAL AREA(ACRES) =       22.1         PEAK FLOW RATE(CFS) =      59.65

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.41   FLOW VELOCITY(FEET/SEC.) =   6.89
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    121.00 =    2627.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.23
  RAINFALL INTENSITY(INCH/HR) =   2.98
  TOTAL STREAM AREA(ACRES) =    22.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     59.65

****************************************************************************
  FLOW PROCESS FROM NODE   2703.00 TO NODE   2702.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   621.00
```

```
  UPSTREAM ELEVATION(FEET) =   2714.00
  DOWNSTREAM ELEVATION(FEET) =   2692.00
  ELEVATION DIFFERENCE(FEET) =     22.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.611
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.00     0.7988       56   10.03
  SUBAREA RUNOFF(CFS) =      8.65
  TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      8.65

****************************************************************************
  FLOW PROCESS FROM NODE   2702.00 TO NODE   2701.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2692.00  DOWNSTREAM ELEVATION(FEET) = 2690.00
  STREET LENGTH(FEET) =   149.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   13.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.36
  STREET FLOW TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   10.82
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.464
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.00     0.7955       56
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    8.27
  TOTAL AREA(ACRES) =        6.0        PEAK FLOW RATE(CFS) =      16.92

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  15.23
  FLOW VELOCITY(FEET/SEC.) =  3.37   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE   2703.00 TO NODE   2701.00 =     770.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2701.00 TO NODE   2700.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2690.00  DOWNSTREAM ELEVATION(FEET) = 2683.00
  STREET LENGTH(FEET) =   473.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.50
    HALFSTREET FLOOD WIDTH(FEET) =   17.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =   12.88
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.147
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        6.00     0.7876       56
  SUBAREA AREA(ACRES) =    6.00      SUBAREA RUNOFF(CFS) =   14.87
  TOTAL AREA(ACRES) =       12.0        PEAK FLOW RATE(CFS) =      31.79

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.19   DEPTH*VELOCITY(FT*FT/SEC.) =   2.26
  LONGEST FLOWPATH FROM NODE   2703.00 TO NODE   2700.00 =    1243.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2700.00 TO NODE    121.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2683.00  DOWNSTREAM(FEET) =  2676.00
  FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.70
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.79
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   13.13
  LONGEST FLOWPATH FROM NODE   2703.00 TO NODE    121.00 =    1448.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    121.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.13
  RAINFALL INTENSITY(INCH/HR) =   3.11
  TOTAL STREAM AREA(ACRES) =    12.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.79

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       59.65    14.23        2.979         22.10
      2       31.79    13.13        3.114         12.00

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
```

```
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       86.82    13.13       3.114
      2       90.06    14.23       2.979

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      90.06   Tc(MIN.) =   14.23
  TOTAL AREA(ACRES) =       34.1
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    121.00 =    2627.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    120.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2676.00  DOWNSTREAM(FEET) =   2663.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   339.00   CHANNEL SLOPE =  0.0383
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.900
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        1.90     0.7806       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.21
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.89
  AVERAGE FLOW DEPTH(FEET) =   1.76   TRAVEL TIME(MIN.) =   0.72
  Tc(MIN.) =   14.94
  SUBAREA AREA(ACRES) =     1.90       SUBAREA RUNOFF(CFS) =    4.30
  TOTAL AREA(ACRES) =       36.0         PEAK FLOW RATE(CFS) =      94.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  1.78   FLOW VELOCITY(FEET/SEC.) =   7.94
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    120.00 =    2966.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.900
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        4.20     0.6612       70
  SUBAREA AREA(ACRES) =    4.20   SUBAREA RUNOFF(CFS) =    8.05
  TOTAL AREA(ACRES) =       40.2   TOTAL RUNOFF(CFS) =     102.42
  TC(MIN.) =   14.94

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
```

```
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      102.42    14.94       2.900       40.20
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    120.00 =    2966.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      195.52    16.51       2.745       75.60
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    120.00 =    4511.00 FEET.

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     279.35      14.94        2.900
      2     292.46      16.51        2.745

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     292.46   Tc(MIN.) =   16.51
  TOTAL AREA(ACRES) =      115.8

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    119.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2663.00  DOWNSTREAM(FEET) =   2661.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =    74.00   CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.733
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.10     0.7753       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     292.56
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.40
  AVERAGE FLOW DEPTH(FEET) =   3.41   TRAVEL TIME(MIN.) =   0.13
  Tc(MIN.) =   16.64
  SUBAREA AREA(ACRES) =     0.10       SUBAREA RUNOFF(CFS) =    0.21
  TOTAL AREA(ACRES) =      115.9         PEAK FLOW RATE(CFS) =     292.67

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.41   FLOW VELOCITY(FEET/SEC.) =   9.40
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    119.00 =    4585.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    119.00 TO NODE    119.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.64
  RAINFALL INTENSITY(INCH/HR) =   2.73
  TOTAL STREAM AREA(ACRES) =   115.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    292.67

****************************************************************************
  FLOW PROCESS FROM NODE   2203.00 TO NODE   2202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   456.00
  UPSTREAM ELEVATION(FEET) =   2701.00
  DOWNSTREAM ELEVATION(FEET) =   2682.00
  ELEVATION DIFFERENCE(FEET) =     19.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.934
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.70     0.8054       56    8.58
  SUBAREA RUNOFF(CFS) =     11.72
  TOTAL AREA(ACRES) =      3.70   TOTAL RUNOFF(CFS) =     11.72

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2201.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2682.00  DOWNSTREAM ELEVATION(FEET) = 2666.00
  STREET LENGTH(FEET) =   506.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   12.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.94
  STREET FLOW TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   10.38
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.544
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.70     0.7973       56
  SUBAREA AREA(ACRES) =    3.70      SUBAREA RUNOFF(CFS) =   10.46
```

```
  TOTAL AREA(ACRES) =        7.4       PEAK FLOW RATE(CFS) =      22.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  14.30
  FLOW VELOCITY(FEET/SEC.) =  4.97   DEPTH*VELOCITY(FT*FT/SEC.) =   2.21
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2201.00 =     962.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2666.00  DOWNSTREAM ELEVATION(FEET) = 2665.00
  STREET LENGTH(FEET) =   209.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.26
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.88
  STREET FLOW TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =   11.54
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.343
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.60     0.7926       56
  SUBAREA AREA(ACRES) =    7.60      SUBAREA RUNOFF(CFS) =   20.14
  TOTAL AREA(ACRES) =       15.0       PEAK FLOW RATE(CFS) =      42.31

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  18.53
  FLOW VELOCITY(FEET/SEC.) =  3.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.27
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE   2200.00 =    1171.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE    119.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2665.00  DOWNSTREAM(FEET) =  2661.00
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.20
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       42.31
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   11.79
  LONGEST FLOWPATH FROM NODE   2203.00 TO NODE    119.00 =    1351.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    119.00 TO NODE    119.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.79
  RAINFALL INTENSITY(INCH/HR) =   3.30
  TOTAL STREAM AREA(ACRES) =    15.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     42.31

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      292.67    16.64        2.733        115.90
      2       42.31    11.79        3.304         15.00

 ********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      249.61    11.79       3.304
      2      327.67    16.64       2.733

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     327.67   Tc(MIN.) =   16.64
  TOTAL AREA(ACRES) =      130.9
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    119.00 =    4585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    118.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2661.00  DOWNSTREAM(FEET) =   2649.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   344.00   CHANNEL SLOPE =  0.0349
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.686
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.20     0.7737       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     327.88
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.64
  AVERAGE FLOW DEPTH(FEET) =   3.39   TRAVEL TIME(MIN.) =   0.54
  Tc(MIN.) =   17.18
  SUBAREA AREA(ACRES) =     0.20       SUBAREA RUNOFF(CFS) =    0.42
  TOTAL AREA(ACRES) =      131.1          PEAK FLOW RATE(CFS) =     328.09

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.39   FLOW VELOCITY(FEET/SEC.) =  10.64
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    118.00 =    4929.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.18
  RAINFALL INTENSITY(INCH/HR) =   2.69
  TOTAL STREAM AREA(ACRES) =   131.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    328.09

****************************************************************************
  FLOW PROCESS FROM NODE   2104.00 TO NODE   2103.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   858.00
  UPSTREAM ELEVATION(FEET) =   2698.00
  DOWNSTREAM ELEVATION(FEET) =   2685.00
  ELEVATION DIFFERENCE(FEET) =     13.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.063
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.70     0.7853       56   13.53
  SUBAREA RUNOFF(CFS) =      8.90
  TOTAL AREA(ACRES) =      3.70   TOTAL RUNOFF(CFS) =      8.90

****************************************************************************
  FLOW PROCESS FROM NODE   2103.00 TO NODE   2102.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2685.00  DOWNSTREAM ELEVATION(FEET) = 2667.00
  STREET LENGTH(FEET) =   743.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   11.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.58
  STREET FLOW TRAVEL TIME(MIN.) =   3.11   Tc(MIN.) =   16.64
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.733
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
```

```
"S.F. 1/4 ACRE LOT"        B        3.70     0.7753       56
SUBAREA AREA(ACRES) =    3.70      SUBAREA RUNOFF(CFS) =    7.84
TOTAL AREA(ACRES) =        7.4        PEAK FLOW RATE(CFS) =      16.74

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  13.42
FLOW VELOCITY(FEET/SEC.) =  4.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.79
LONGEST FLOWPATH FROM NODE   2104.00 TO NODE   2102.00 =    1601.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2102.00 TO NODE   2101.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 2667.00  DOWNSTREAM ELEVATION(FEET) = 2657.00
STREET LENGTH(FEET) =   640.00   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 22.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.14
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.47
  HALFSTREET FLOOD WIDTH(FEET) =   15.48
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.70
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.73
STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =   19.52
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.503
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
RESIDENTIAL
"S.F. 1/4 ACRE LOT"        B        2.50     0.7672       56
SUBAREA AREA(ACRES) =    2.50      SUBAREA RUNOFF(CFS) =    4.80
TOTAL AREA(ACRES) =        9.9        PEAK FLOW RATE(CFS) =      21.54

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  16.33
FLOW VELOCITY(FEET/SEC.) =  3.77   DEPTH*VELOCITY(FT*FT/SEC.) =   1.83
LONGEST FLOWPATH FROM NODE   2104.00 TO NODE   2101.00 =    2241.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE   2101.00 TO NODE   2101.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.503
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
RESIDENTIAL
"S.F. 1-ACRE LOT"          B        4.90     0.6876       56
SUBAREA AREA(ACRES) =    4.90   SUBAREA RUNOFF(CFS) =    8.43
TOTAL AREA(ACRES) =       14.8   TOTAL RUNOFF(CFS) =      29.98
TC(MIN.) =   19.52
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2657.00  DOWNSTREAM ELEVATION(FEET) = 2655.00
  STREET LENGTH(FEET) =   490.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.50
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.67
    HALFSTREET FLOOD WIDTH(FEET) =   22.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   22.46
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.317
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.40     0.7599       56
  SUBAREA AREA(ACRES) =    7.40      SUBAREA RUNOFF(CFS) =   13.03
  TOTAL AREA(ACRES) =       22.2        PEAK FLOW RATE(CFS) =      43.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  23.34
  FLOW VELOCITY(FEET/SEC.) =  2.95   DEPTH*VELOCITY(FT*FT/SEC.) =   2.06
  LONGEST FLOWPATH FROM NODE   2104.00 TO NODE   2100.00 =    2731.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE    118.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2655.00  DOWNSTREAM(FEET) =  2649.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.94
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.01
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   22.48
  LONGEST FLOWPATH FROM NODE   2104.00 TO NODE    118.00 =    2761.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    118.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   22.48
 RAINFALL INTENSITY(INCH/HR) =   2.32
 TOTAL STREAM AREA(ACRES) =    22.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.01

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      328.09    17.18        2.686       131.10
     2       43.01    22.48        2.316        22.20

*********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
**************************************************************************

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      360.95    17.18       2.686
     2      325.98    22.48       2.316

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     360.95   Tc(MIN.) =   17.18
 TOTAL AREA(ACRES) =      153.3
 LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    118.00 =    4929.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    118.00 TO NODE    117.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  2649.00  DOWNSTREAM(FEET) =  2647.00
 FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  57.0 INCH PIPE IS  45.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.81
 ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     360.95
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   17.22
 LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    117.00 =    4993.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    117.00 TO NODE    116.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   2647.00  DOWNSTREAM(FEET) =   2623.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =   815.00   CHANNEL SLOPE =  0.0294
 CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
 MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.575
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        B        0.80     0.7699       56
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     361.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.25
```

```
  AVERAGE FLOW DEPTH(FEET) =   3.70   TRAVEL TIME(MIN.) =   1.33
  Tc(MIN.) =   18.55
  SUBAREA AREA(ACRES) =     0.80       SUBAREA RUNOFF(CFS) =    1.59
  TOTAL AREA(ACRES) =      154.1         PEAK FLOW RATE(CFS) =     362.54

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.70   FLOW VELOCITY(FEET/SEC.) =  10.25
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    116.00 =    5808.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    116.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      362.54    18.55       2.575      154.10
  LONGEST FLOWPATH FROM NODE   2309.00 TO NODE    116.00 =    5808.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      139.24    24.41       2.214       71.50
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    116.00 =    6693.00 FEET.

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     468.37      18.55        2.575
      2     451.00      24.41        2.214

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     468.37   Tc(MIN.) =   18.55
  TOTAL AREA(ACRES) =      225.6

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    116.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    115.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2623.00  DOWNSTREAM(FEET) =   2607.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   574.00   CHANNEL SLOPE =  0.0279
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   4.00

         ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
             CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
             ALLOWABLE DEPTH).
             AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
```

```
          ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.514
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE           GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        B        0.60     0.7677       56
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     468.95
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.72
 AVERAGE FLOW DEPTH(FEET) =   4.00   TRAVEL TIME(MIN.) =   0.82
 Tc(MIN.) =   19.37
 SUBAREA AREA(ACRES) =     0.60       SUBAREA RUNOFF(CFS) =    1.16
 TOTAL AREA(ACRES) =      226.2         PEAK FLOW RATE(CFS) =     469.53

        ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
            CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
            ALLOWABLE DEPTH).
            AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
            ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.


 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  4.00   FLOW VELOCITY(FEET/SEC.) =  11.74

 ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

 LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    115.00 =    7267.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      469.53    19.37       2.514      226.20
 LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    115.00 =    7267.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      127.21    18.63       2.569       57.00
 LONGEST FLOWPATH FROM NODE   1701.00 TO NODE    115.00 =    3308.00 FEET.

 ********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     578.91      18.63        2.569
     2     594.06      19.37        2.514

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     594.06   Tc(MIN.) =   19.37
 TOTAL AREA(ACRES) =      283.2

****************************************************************************
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```
  FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    114.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2607.00  DOWNSTREAM(FEET) =  2605.00
  FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  54.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.23
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     594.06
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   19.40
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    114.00 =    7330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    114.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.40
  RAINFALL INTENSITY(INCH/HR) =   2.51
  TOTAL STREAM AREA(ACRES) =   283.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    594.06

****************************************************************************
  FLOW PROCESS FROM NODE   1505.00 TO NODE   1504.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   960.00
  UPSTREAM ELEVATION(FEET) =   2816.00
  DOWNSTREAM ELEVATION(FEET) =   2774.00
  ELEVATION DIFFERENCE(FEET) =     42.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.227
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B       1.90     0.7676       56   12.31
  SUBAREA RUNOFF(CFS) =      4.71
  TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =      4.71

****************************************************************************
  FLOW PROCESS FROM NODE   1504.00 TO NODE   1503.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2774.00  DOWNSTREAM ELEVATION(FEET) = 2753.00
  STREET LENGTH(FEET) =   416.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.92
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   10.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.97
  STREET FLOW TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   13.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.053
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        1.90     0.7621       56
  SUBAREA AREA(ACRES) =    1.90      SUBAREA RUNOFF(CFS) =    4.42
  TOTAL AREA(ACRES) =        3.8        PEAK FLOW RATE(CFS) =       9.13

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  11.83
  FLOW VELOCITY(FEET/SEC.) =  5.75   DEPTH*VELOCITY(FT*FT/SEC.) =   2.27
  LONGEST FLOWPATH FROM NODE   1505.00 TO NODE   1503.00 =    1376.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1503.00 TO NODE   1502.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2753.00  DOWNSTREAM ELEVATION(FEET) = 2700.00
  STREET LENGTH(FEET) =  1360.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   16.14
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.88
  STREET FLOW TRAVEL TIME(MIN.) =   3.79   Tc(MIN.) =   17.39
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.668
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        7.60     0.7477       56
  SUBAREA AREA(ACRES) =    7.60      SUBAREA RUNOFF(CFS) =   15.16
  TOTAL AREA(ACRES) =       11.4        PEAK FLOW RATE(CFS) =      24.29

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
  DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  18.77
  FLOW VELOCITY(FEET/SEC.) =  6.54   DEPTH*VELOCITY(FT*FT/SEC.) =   3.49
  LONGEST FLOWPATH FROM NODE   1505.00 TO NODE   1502.00 =    2736.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1502.00 TO NODE   1501.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2700.00  DOWNSTREAM ELEVATION(FEET) = 2640.00
  STREET LENGTH(FEET) =  1705.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.91
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    6.82
    SPLIT DEPTH(FEET) =    0.20   SPLIT FLOOD WIDTH(FEET) =    2.03
    SPLIT FLOW(CFS) =    0.62   SPLIT VELOCITY(FEET/SEC.) =    2.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.82
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.08
  STREET FLOW TRAVEL TIME(MIN.) =   4.17   Tc(MIN.) =   21.56
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.370
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B       12.20     0.7345       56
  SUBAREA AREA(ACRES) =   12.20      SUBAREA RUNOFF(CFS) =   21.24
  TOTAL AREA(ACRES) =       23.6        PEAK FLOW RATE(CFS) =      45.52

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  6.82   DEPTH*VELOCITY(FT*FT/SEC.) =   4.08
  LONGEST FLOWPATH FROM NODE   1505.00 TO NODE   1501.00 =    4441.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1501.00 TO NODE   1501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.370
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.50     0.6241       70
  SUBAREA AREA(ACRES) =    2.50   SUBAREA RUNOFF(CFS) =    3.70
  TOTAL AREA(ACRES) =       26.1   TOTAL RUNOFF(CFS) =      49.22
  TC(MIN.) =   21.56
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1501.00 TO NODE   1500.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2640.00  DOWNSTREAM ELEVATION(FEET) = 2607.00
  STREET LENGTH(FEET) =   955.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      61.20
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    6.75
    SPLIT DEPTH(FEET) =    0.56   SPLIT FLOOD WIDTH(FEET) =   20.17
    SPLIT FLOW(CFS) =   27.23   SPLIT VELOCITY(FEET/SEC.) =    6.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.75
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.04
  STREET FLOW TRAVEL TIME(MIN.) =   2.36   Tc(MIN.) =   23.92
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.239
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B       14.70     0.7279       56
  SUBAREA AREA(ACRES) =   14.70      SUBAREA RUNOFF(CFS) =   23.95
  TOTAL AREA(ACRES) =       40.8        PEAK FLOW RATE(CFS) =      73.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  6.96   DEPTH*VELOCITY(FT*FT/SEC.) =   4.24
  LONGEST FLOWPATH FROM NODE   1505.00 TO NODE   1500.00 =    5396.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1500.00 TO NODE    114.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2607.00  DOWNSTREAM(FEET) =  2605.00
  FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.89
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.18
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   23.96
  LONGEST FLOWPATH FROM NODE   1505.00 TO NODE    114.00 =    5444.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    114.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.96
  RAINFALL INTENSITY(INCH/HR) =   2.24
  TOTAL STREAM AREA(ACRES) =    40.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     73.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      594.06    19.40        2.512        283.20
      2       73.18    23.96        2.236         40.80

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      653.32    19.40       2.512
      2      602.15    23.96       2.236

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     653.32   Tc(MIN.) =   19.40
  TOTAL AREA(ACRES) =      324.0
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    114.00 =    7330.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    114.00 TO NODE    113.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2605.00  DOWNSTREAM(FEET) =  2576.00
  FLOW LENGTH(FEET) =   747.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  53.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  30.10
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     653.32
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   19.82
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    113.00 =    8077.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.483
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.70     0.7665       56
  SUBAREA AREA(ACRES) =    3.70   SUBAREA RUNOFF(CFS) =    7.04
  TOTAL AREA(ACRES) =      327.7   TOTAL RUNOFF(CFS) =     660.36
  TC(MIN.) =   19.82
```

```
******************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE = 152
------------------------------------------------------------------------------
  >>>>>STORE PEAK FLOWRATE TABLE TO A FILE<<<<<
==============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 113

******************************************************************************
  FLOW PROCESS FROM NODE   1304.00 TO NODE   1303.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   455.00
  UPSTREAM ELEVATION(FEET) =   2621.00
  DOWNSTREAM ELEVATION(FEET) =   2610.00
  ELEVATION DIFFERENCE(FEET) =     11.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.562
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        2.90     0.7773       56   10.28
  SUBAREA RUNOFF(CFS) =      8.03
  TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      8.03

******************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1303.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.562
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.10     0.7977       56
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    5.97
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      14.00
  TC(MIN.) =   10.28

******************************************************************************
  FLOW PROCESS FROM NODE   1303.00 TO NODE   1302.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2610.00  DOWNSTREAM(FEET) =   2584.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   806.00   CHANNEL SLOPE =  0.0323
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.263
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.80     0.7906       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.91
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.54
  AVERAGE FLOW DEPTH(FEET) =   0.56   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   12.06
  SUBAREA AREA(ACRES) =     3.80       SUBAREA RUNOFF(CFS) =    9.80
```

```
  TOTAL AREA(ACRES) =        8.8         PEAK FLOW RATE(CFS) =      23.80

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   8.06
  LONGEST FLOWPATH FROM NODE   1304.00 TO NODE   1302.00 =    1261.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.263
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        3.50     0.7688       56
  SUBAREA AREA(ACRES) =    3.50   SUBAREA RUNOFF(CFS) =    8.78
  TOTAL AREA(ACRES) =       12.3   TOTAL RUNOFF(CFS) =      32.58
  TC(MIN.) =   12.06

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1302.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.263
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        2.70     0.8781       56
  SUBAREA AREA(ACRES) =    2.70   SUBAREA RUNOFF(CFS) =    7.74
  TOTAL AREA(ACRES) =       15.0   TOTAL RUNOFF(CFS) =      40.31
  TC(MIN.) =   12.06

****************************************************************************
  FLOW PROCESS FROM NODE   1302.00 TO NODE   1301.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2584.00  DOWNSTREAM ELEVATION(FEET) = 2569.00
  STREET LENGTH(FEET) =  1098.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   22.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.59
  STREET FLOW TRAVEL TIME(MIN.) =   4.27   Tc(MIN.) =   16.34
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
```

```
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 COMMERCIAL                B        3.50     0.8752       56
 SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    8.46
 TOTAL AREA(ACRES) =       18.5        PEAK FLOW RATE(CFS) =      48.77

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  23.14
 FLOW VELOCITY(FEET/SEC.) =  4.40   DEPTH*VELOCITY(FT*FT/SEC.) =   2.73
 LONGEST FLOWPATH FROM NODE   1304.00 TO NODE   1301.00 =    2359.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   1301.00 TO NODE   1301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE           GROUP   (ACRES)   Coefficient    CN
 NATURAL POOR COVER
 "BARREN"                  B        2.30     0.6525       70
 SUBAREA AREA(ACRES) =    2.30   SUBAREA RUNOFF(CFS) =    4.14
 TOTAL AREA(ACRES) =       20.8   TOTAL RUNOFF(CFS) =      52.92
 TC(MIN.) =   16.34

****************************************************************************
 FLOW PROCESS FROM NODE   1301.00 TO NODE   1301.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.761
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE           GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"       B        5.00     0.7762       56
 SUBAREA AREA(ACRES) =    5.00   SUBAREA RUNOFF(CFS) =   10.72
 TOTAL AREA(ACRES) =       25.8   TOTAL RUNOFF(CFS) =      63.63
 TC(MIN.) =   16.34

****************************************************************************
 FLOW PROCESS FROM NODE   1301.00 TO NODE   1301.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   16.34
 RAINFALL INTENSITY(INCH/HR) =   2.76
 TOTAL STREAM AREA(ACRES) =    25.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     63.63

****************************************************************************
 FLOW PROCESS FROM NODE   1402.00 TO NODE   1401.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   705.00
 UPSTREAM ELEVATION(FEET) =   2616.00
 DOWNSTREAM ELEVATION(FEET) =   2599.00
 ELEVATION DIFFERENCE(FEET) =     17.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.366
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       5.00     0.7932       56   11.40
  SUBAREA RUNOFF(CFS) =     13.35
  TOTAL AREA(ACRES) =      5.00   TOTAL RUNOFF(CFS) =     13.35

****************************************************************************
  FLOW PROCESS FROM NODE   1401.00 TO NODE   1400.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2599.00  DOWNSTREAM ELEVATION(FEET) = 2588.00
  STREET LENGTH(FEET) =   597.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.26
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   16.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.07
  STREET FLOW TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   13.78
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.032
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B      10.00     0.7845       56
  SUBAREA AREA(ACRES) =   10.00      SUBAREA RUNOFF(CFS) =   23.79
  TOTAL AREA(ACRES) =       15.0        PEAK FLOW RATE(CFS) =      37.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.76   DEPTH*VELOCITY(FT*FT/SEC.) =   2.59
  LONGEST FLOWPATH FROM NODE   1402.00 TO NODE   1400.00 =    1302.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1400.00 TO NODE   1301.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2588.00  DOWNSTREAM ELEVATION(FEET) = 2569.00
  STREET LENGTH(FEET) =   783.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
```

```
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.96
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   16.04
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.789
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       10.90     0.7771       56
  SUBAREA AREA(ACRES) =   10.90      SUBAREA RUNOFF(CFS) =   23.62
  TOTAL AREA(ACRES) =       25.9        PEAK FLOW RATE(CFS) =      60.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.27   DEPTH*VELOCITY(FT*FT/SEC.) =   3.74
  LONGEST FLOWPATH FROM NODE   1402.00 TO NODE   1301.00 =    2085.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE   1301.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.04
  RAINFALL INTENSITY(INCH/HR) =   2.79
  TOTAL STREAM AREA(ACRES) =    25.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     60.76

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       63.63    16.34        2.761         25.80
      2       60.76    16.04        2.789         25.90

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      123.26    16.04       2.789
      2      123.79    16.34       2.761

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     123.79   Tc(MIN.) =   16.34
  TOTAL AREA(ACRES) =       51.7
  LONGEST FLOWPATH FROM NODE   1304.00 TO NODE   1301.00 =    2359.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1301.00 TO NODE   1300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2569.00  DOWNSTREAM ELEVATION(FEET) = 2565.00
  STREET LENGTH(FEET) =   496.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     126.71
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   40.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.02
  STREET FLOW TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =   18.14
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.607
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        3.00     0.7452       56
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    5.83
  TOTAL AREA(ACRES) =       54.7        PEAK FLOW RATE(CFS) =     129.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  40.61
  FLOW VELOCITY(FEET/SEC.) =  4.62   DEPTH*VELOCITY(FT*FT/SEC.) =   4.07
  LONGEST FLOWPATH FROM NODE   1304.00 TO NODE   1300.00 =    2855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE   1300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.607
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.40     0.7710       56
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    0.80
  TOTAL AREA(ACRES) =       55.1   TOTAL RUNOFF(CFS) =     130.42
  TC(MIN.) =   18.14

****************************************************************************
  FLOW PROCESS FROM NODE   1300.00 TO NODE    112.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2565.00  DOWNSTREAM(FEET) =  2558.00
  FLOW LENGTH(FEET) =    47.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  33.62
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     130.42
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   18.16
  LONGEST FLOWPATH FROM NODE   1304.00 TO NODE    112.00 =    2902.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 113
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
   STREAM     Q         Tc
   NUMBER   (CFS)     (MIN.)
    1      660.36      19.82
    TOTAL AREA(ACRES) =      327.7
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    113.00 =    8077.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM    RUNOFF       Tc
  NUMBER     (CFS)     (MIN.)
     1      660.36      19.82
    TOTAL AREA =       327.7
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    113.00 =    8077.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    113.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    112.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2576.00  DOWNSTREAM(FEET) =   2558.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   563.00   CHANNEL SLOPE =  0.0320
  CHANNEL BASE(FEET) =    6.00    "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =   6.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.431
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        1.80     0.7645       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     662.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  12.24
  AVERAGE FLOW DEPTH(FEET) =   4.33   TRAVEL TIME(MIN.) =   0.77
```

```
  Tc(MIN.) =   20.58
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    3.35
  TOTAL AREA(ACRES) =      329.5         PEAK FLOW RATE(CFS) =     663.70

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.33   FLOW VELOCITY(FEET/SEC.) =  12.26
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    112.00 =    8640.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      663.70    20.58       2.431      329.50
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    112.00 =    8640.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      130.42    18.16       2.605       55.10
  LONGEST FLOWPATH FROM NODE   1304.00 TO NODE    112.00 =    2902.00 FEET.

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     716.06      18.16        2.605
      2     785.45      20.58        2.431

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     785.45   Tc(MIN.) =   20.58
  TOTAL AREA(ACRES) =      384.6

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    112.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    112.00 TO NODE    111.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2558.00  DOWNSTREAM(FEET) =  2544.00
  FLOW LENGTH(FEET) =   527.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  78.0 INCH PIPE IS  63.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.06
  ESTIMATED PIPE DIAMETER(INCH) =  78.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     785.45
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   20.91
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    111.00 =    9167.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.91
  RAINFALL INTENSITY(INCH/HR) =   2.41
  TOTAL STREAM AREA(ACRES) =   384.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    785.45

****************************************************************************
  FLOW PROCESS FROM NODE   1203.00 TO NODE   1202.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   709.00
  UPSTREAM ELEVATION(FEET) =   2606.00
  DOWNSTREAM ELEVATION(FEET) =   2597.00
  ELEVATION DIFFERENCE(FEET) =      9.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.133
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        5.00     0.7872       56   12.99
  SUBAREA RUNOFF(CFS) =     12.33
  TOTAL AREA(ACRES) =      5.00   TOTAL RUNOFF(CFS) =     12.33

****************************************************************************
  FLOW PROCESS FROM NODE   1202.00 TO NODE   1201.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2597.00  DOWNSTREAM ELEVATION(FEET) = 2567.00
  STREET LENGTH(FEET) =   950.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   19.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
  STREET FLOW TRAVEL TIME(MIN.) =   2.66   Tc(MIN.) =   15.65
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.827
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       10.20     0.7783       56
  SUBAREA AREA(ACRES) =   10.20      SUBAREA RUNOFF(CFS) =   22.45
```

```
  TOTAL AREA(ACRES) =       15.2        PEAK FLOW RATE(CFS) =      34.78

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  6.46   DEPTH*VELOCITY(FT*FT/SEC.) =   3.86
  LONGEST FLOWPATH FROM NODE   1203.00 TO NODE   1201.00 =    1659.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1201.00 TO NODE   1200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2567.00  DOWNSTREAM ELEVATION(FEET) = 2549.00
  STREET LENGTH(FEET) =   494.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.56
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    6.94
    SPLIT DEPTH(FEET) =    0.36   SPLIT FLOOD WIDTH(FEET) =   10.33
    SPLIT FLOW(CFS) =    5.68   SPLIT VELOCITY(FEET/SEC.) =    4.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.15
  STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   16.83
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        5.50     0.7747       56
  SUBAREA AREA(ACRES) =    5.50      SUBAREA RUNOFF(CFS) =   11.57
  TOTAL AREA(ACRES) =       20.7        PEAK FLOW RATE(CFS) =      46.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  6.94   DEPTH*VELOCITY(FT*FT/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE   1203.00 TO NODE   1200.00 =    2153.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.30     0.6495       70
  SUBAREA AREA(ACRES) =    1.30   SUBAREA RUNOFF(CFS) =    2.29
```

```
  TOTAL AREA(ACRES) =       22.0   TOTAL RUNOFF(CFS) =      48.64
  TC(MIN.) =   16.83

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1200.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        3.40     0.8749       56
  SUBAREA AREA(ACRES) =    3.40   SUBAREA RUNOFF(CFS) =    8.08
  TOTAL AREA(ACRES) =       25.4   TOTAL RUNOFF(CFS) =      56.72
  TC(MIN.) =   16.83

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE    111.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2549.00  DOWNSTREAM(FEET) =  2544.00
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.22
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      56.72
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   16.85
  LONGEST FLOWPATH FROM NODE   1203.00 TO NODE    111.00 =    2183.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    111.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.85
  RAINFALL INTENSITY(INCH/HR) =   2.71
  TOTAL STREAM AREA(ACRES) =    25.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     56.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      785.45    20.91        2.411       384.60
      2       56.72    16.85        2.714        25.40

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      689.76    16.85       2.714
```

```
     2      835.83    20.91       2.411

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     835.83   Tc(MIN.) =   20.91
  TOTAL AREA(ACRES) =      410.0
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    111.00 =    9167.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2544.00  DOWNSTREAM(FEET) =   2536.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.00   CHANNEL SLOPE =  0.0287
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.399
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.30     0.7632       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     836.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  26.10
  AVERAGE FLOW DEPTH(FEET) =   3.48   TRAVEL TIME(MIN.) =   0.18
  Tc(MIN.) =   21.09
  SUBAREA AREA(ACRES) =     0.30       SUBAREA RUNOFF(CFS) =    0.55
  TOTAL AREA(ACRES) =      410.3         PEAK FLOW RATE(CFS) =     836.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.48   FLOW VELOCITY(FEET/SEC.) =  26.11
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    110.00 =    9446.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.09
  RAINFALL INTENSITY(INCH/HR) =   2.40
  TOTAL STREAM AREA(ACRES) =   410.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    836.38

****************************************************************************
  FLOW PROCESS FROM NODE   1102.00 TO NODE   1101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   666.00
  UPSTREAM ELEVATION(FEET) =   2565.00
  DOWNSTREAM ELEVATION(FEET) =   2551.00
  ELEVATION DIFFERENCE(FEET) =     14.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.658
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  MOBILE HOME PARK           B       5.00     0.8499       56    9.80
  SUBAREA RUNOFF(CFS) =     15.54
  TOTAL AREA(ACRES) =      5.00   TOTAL RUNOFF(CFS) =     15.54
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1101.00 TO NODE   1100.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2551.00  DOWNSTREAM ELEVATION(FEET) = 2546.00
  STREET LENGTH(FEET) =   697.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.66
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.89
  STREET FLOW TRAVEL TIME(MIN.) =   3.56   Tc(MIN.) =   13.35
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.085
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  MOBILE HOME PARK           B       10.80     0.8430       56
  SUBAREA AREA(ACRES) =   10.80      SUBAREA RUNOFF(CFS) =   28.09
  TOTAL AREA(ACRES) =       15.8        PEAK FLOW RATE(CFS) =      43.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  3.81   DEPTH*VELOCITY(FT*FT/SEC.) =   2.46
  LONGEST FLOWPATH FROM NODE   1102.00 TO NODE   1100.00 =    1363.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2546.00  DOWNSTREAM(FEET) =  2536.00
  FLOW LENGTH(FEET) =   114.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.32
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.63
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   13.44
  LONGEST FLOWPATH FROM NODE   1102.00 TO NODE    110.00 =    1477.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   13.44
  RAINFALL INTENSITY(INCH/HR) =   3.07
  TOTAL STREAM AREA(ACRES) =    15.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.63

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      836.38    21.09        2.399       410.30
      2       43.63    13.44        3.074        15.80

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      576.73    13.44       3.074
      2      870.44    21.09       2.399

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     870.44   Tc(MIN.) =   21.09
  TOTAL AREA(ACRES) =      426.1
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    110.00 =    9446.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE = 152
----------------------------------------------------------------------------
  >>>>>STORE PEAK FLOWRATE TABLE TO A FILE<<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 110

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1001.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   679.00
  UPSTREAM ELEVATION(FEET) =   2548.00
  DOWNSTREAM ELEVATION(FEET) =   2525.00
  ELEVATION DIFFERENCE(FEET) =     23.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.523
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       4.00     0.7969       56   10.49
  SUBAREA RUNOFF(CFS) =     11.23
  TOTAL AREA(ACRES) =      4.00   TOTAL RUNOFF(CFS) =     11.23

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE   1000.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
```

```
  UPSTREAM ELEVATION(FEET) = 2525.00  DOWNSTREAM ELEVATION(FEET) = 2524.00
  STREET LENGTH(FEET) =   631.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.29
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.00
  STREET FLOW TRAVEL TIME(MIN.) =   6.63   Tc(MIN.) =   17.12
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.691
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        6.70     0.7739       56
  SUBAREA AREA(ACRES) =    6.70      SUBAREA RUNOFF(CFS) =   13.95
  TOTAL AREA(ACRES) =       10.7        PEAK FLOW RATE(CFS) =      25.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  22.85
  FLOW VELOCITY(FEET/SEC.) =  1.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.24
  LONGEST FLOWPATH FROM NODE   1002.00 TO NODE   1000.00 =    1310.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1000.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.691
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.20     0.6478       70
  SUBAREA AREA(ACRES) =    2.20   SUBAREA RUNOFF(CFS) =    3.83
  TOTAL AREA(ACRES) =       12.9   TOTAL RUNOFF(CFS) =      29.01
  TC(MIN.) =   17.12

****************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2524.00  DOWNSTREAM(FEET) =  2520.00
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.85
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.01
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   17.19
  LONGEST FLOWPATH FROM NODE   1002.00 TO NODE    109.00 =    1374.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    806.00 TO NODE    805.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   581.00
  UPSTREAM ELEVATION(FEET) =   2575.00
  DOWNSTREAM ELEVATION(FEET) =   2563.00
  ELEVATION DIFFERENCE(FEET) =     12.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.981
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  COMMERCIAL                 B        2.90     0.8812       56    8.40
  SUBAREA RUNOFF(CFS) =     10.17
  TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =     10.17

****************************************************************************
  FLOW PROCESS FROM NODE    805.00 TO NODE    805.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.981
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.10     0.8062       56
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    6.74
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      16.91
  TC(MIN.) =    8.40

****************************************************************************
  FLOW PROCESS FROM NODE    805.00 TO NODE    804.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2563.00  DOWNSTREAM ELEVATION(FEET) = 2553.00
  STREET LENGTH(FEET) =   329.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   14.95
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.30
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =    9.49
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.722
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       5.00     0.8012       56
  SUBAREA AREA(ACRES) =    5.00      SUBAREA RUNOFF(CFS) =   14.91
  TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      31.82

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  16.64
  FLOW VELOCITY(FEET/SEC.) =  5.38   DEPTH*VELOCITY(FT*FT/SEC.) =   2.64
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    804.00 =     910.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    803.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2553.00  DOWNSTREAM ELEVATION(FEET) = 2536.00
  STREET LENGTH(FEET) =   786.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      44.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.57
    HALFSTREET FLOOD WIDTH(FEET) =   20.36
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.89
  STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =   12.05
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.264
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       9.70     0.7907       56
  SUBAREA AREA(ACRES) =    9.70      SUBAREA RUNOFF(CFS) =   25.03
  TOTAL AREA(ACRES) =       19.7        PEAK FLOW RATE(CFS) =      56.86

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  5.46   DEPTH*VELOCITY(FT*FT/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    803.00 =    1696.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    802.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2536.00  DOWNSTREAM ELEVATION(FEET) = 2535.00
```

```
  STREET LENGTH(FEET) =   661.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.93
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.94
    HALFSTREET FLOOD WIDTH(FEET) =   32.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.25
  STREET FLOW TRAVEL TIME(MIN.) =   4.60   Tc(MIN.) =   16.65
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.732
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        9.80     0.7503       56
  SUBAREA AREA(ACRES) =    9.80      SUBAREA RUNOFF(CFS) =   20.09
  TOTAL AREA(ACRES) =       29.5        PEAK FLOW RATE(CFS) =      76.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.98   HALFSTREET FLOOD WIDTH(FEET) =  34.67
  FLOW VELOCITY(FEET/SEC.) =  2.48   DEPTH*VELOCITY(FT*FT/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    802.00 =    2357.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    802.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.65
  RAINFALL INTENSITY(INCH/HR) =   2.73
  TOTAL STREAM AREA(ACRES) =    29.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     76.95

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    901.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   674.00
  UPSTREAM ELEVATION(FEET) =   2574.00
  DOWNSTREAM ELEVATION(FEET) =   2558.00
  ELEVATION DIFFERENCE(FEET) =     16.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.697
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  MOBILE HOME PARK           B        3.30     0.8503       56    9.61
  SUBAREA RUNOFF(CFS) =     10.38
  TOTAL AREA(ACRES) =      3.30   TOTAL RUNOFF(CFS) =     10.38
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    901.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.697
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        1.70     0.8006       56
  SUBAREA AREA(ACRES) =    1.70   SUBAREA RUNOFF(CFS) =    5.03
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      15.41
  TC(MIN.) =    9.61

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    900.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2558.00  DOWNSTREAM ELEVATION(FEET) = 2548.00
  STREET LENGTH(FEET) =   365.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   14.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.12
  STREET FLOW TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   10.90
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.450
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  MOBILE HOME PARK           B        4.40     0.8476       56
  SUBAREA AREA(ACRES) =    4.40      SUBAREA RUNOFF(CFS) =   12.87
  TOTAL AREA(ACRES) =        9.4        PEAK FLOW RATE(CFS) =      28.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  16.27
  FLOW VELOCITY(FEET/SEC.) =  4.99   DEPTH*VELOCITY(FT*FT/SEC.) =   2.41
  LONGEST FLOWPATH FROM NODE    902.00 TO NODE    900.00 =    1039.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    900.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.450
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
```

```
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        0.60     0.7742       56
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    1.60
  TOTAL AREA(ACRES) =       10.0   TOTAL RUNOFF(CFS) =      29.88
  TC(MIN.) =   10.90

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2548.00  DOWNSTREAM(FEET) =   2535.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   620.00   CHANNEL SLOPE =  0.0210
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.092
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        0.10     0.7633       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.30
  AVERAGE FLOW DEPTH(FEET) =   0.93   TRAVEL TIME(MIN.) =   2.40
  Tc(MIN.) =   13.30
  SUBAREA AREA(ACRES) =     0.10       SUBAREA RUNOFF(CFS) =    0.24
  TOTAL AREA(ACRES) =       10.1         PEAK FLOW RATE(CFS) =      30.11

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.94   FLOW VELOCITY(FEET/SEC.) =   4.30
  LONGEST FLOWPATH FROM NODE    902.00 TO NODE    802.00 =    1659.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    802.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.30
  RAINFALL INTENSITY(INCH/HR) =   3.09
  TOTAL STREAM AREA(ACRES) =    10.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    30.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       76.95    16.65        2.732        29.50
      2       30.11    13.30        3.092        10.10

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
```

```
    1       91.55    13.30       3.092
    2      103.55    16.65       2.732

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     103.55   Tc(MIN.) =   16.65
  TOTAL AREA(ACRES) =       39.6
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    802.00 =    2357.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    801.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2535.00  DOWNSTREAM ELEVATION(FEET) = 2530.00
  STREET LENGTH(FEET) =   294.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     113.45
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.75
    HALFSTREET FLOOD WIDTH(FEET) =   25.49
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.97
  STREET FLOW TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =   17.40
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.667
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        9.60     0.7731       56
  SUBAREA AREA(ACRES) =    9.60      SUBAREA RUNOFF(CFS) =   19.79
  TOTAL AREA(ACRES) =       49.2        PEAK FLOW RATE(CFS) =     123.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  26.27
  FLOW VELOCITY(FEET/SEC.) =  6.77   DEPTH*VELOCITY(FT*FT/SEC.) =   5.24
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    801.00 =    2651.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    800.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2530.00  DOWNSTREAM ELEVATION(FEET) = 2528.00
  STREET LENGTH(FEET) =   503.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```

```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     132.88
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.01
    HALFSTREET FLOOD WIDTH(FEET) =   35.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.10
  STREET FLOW TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =   19.45
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.508
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        9.90     0.7674       56
  SUBAREA AREA(ACRES) =    9.90      SUBAREA RUNOFF(CFS) =   19.06
  TOTAL AREA(ACRES) =       59.1        PEAK FLOW RATE(CFS) =     142.40

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.03   HALFSTREET FLOOD WIDTH(FEET) =  36.52
  FLOW VELOCITY(FEET/SEC.) =  4.15   DEPTH*VELOCITY(FT*FT/SEC.) =   4.27
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    800.00 =    3154.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2528.00  DOWNSTREAM(FEET) =  2520.00
  FLOW LENGTH(FEET) =   339.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  34.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.88
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     142.40
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   19.79
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    109.00 =    3493.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 3 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 110
  MEMORY BANK #  3 DEFINED AS FOLLOWS:
   STREAM     Q         Tc
   NUMBER   (CFS)     (MIN.)
    1      870.44      21.09
    TOTAL AREA(ACRES) =      426.1
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    110.00 =    9446.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  3 COPIED ONTO MAIN-STREAM MEMORY<<<<<
```

```
================================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  STREAM    RUNOFF       Tc
  NUMBER     (CFS)     (MIN.)
     1      870.44      21.09
    TOTAL AREA =       426.1
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    110.00 =    9446.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    109.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2536.00  DOWNSTREAM(FEET) =   2520.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   623.00   CHANNEL SLOPE =  0.0257
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.374
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.20     0.7622       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     874.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  25.34
  AVERAGE FLOW DEPTH(FEET) =   3.64   TRAVEL TIME(MIN.) =   0.41
  Tc(MIN.) =   21.50
  SUBAREA AREA(ACRES) =     4.20       SUBAREA RUNOFF(CFS) =    7.60
  TOTAL AREA(ACRES) =      430.3         PEAK FLOW RATE(CFS) =     878.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.65   FLOW VELOCITY(FEET/SEC.) =  25.37
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    109.00 =   10069.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      878.04    21.50       2.374      430.30
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    109.00 =   10069.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       29.01    17.19       2.685       12.90
  LONGEST FLOWPATH FROM NODE   1002.00 TO NODE    109.00 =    1374.00 FEET.

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

```
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     731.01      17.19        2.685
      2     903.69      21.50        2.374

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     903.69   Tc(MIN.) =   21.50
  TOTAL AREA(ACRES) =      443.2

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      903.69    21.50       2.374      443.20
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    109.00 =   10069.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      142.40    19.79       2.485       59.10
  LONGEST FLOWPATH FROM NODE    806.00 TO NODE    109.00 =    3493.00 FEET.

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF      Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1     974.19      19.79        2.485
      2    1039.75      21.50        2.374

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1039.75   Tc(MIN.) =   21.50
  TOTAL AREA(ACRES) =      502.3

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  71
----------------------------------------------------------------------------
  >>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<
  >>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<
============================================================================
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.36; LAG(HR) = 0.29
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      502.3
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    109.00 =   10069.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0310;Lca/L=0.4,n=.0278;Lca/L=0.5,n=.0255;Lca/L=0.6,n=.0238
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.67  RUNOFF VOLUME(AF) =      73.22
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
```

```
    3H-STORM =    688.30
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    688.30
  TOTAL PEAK FLOW RATE(CFS) =    688.30 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =   1039.75
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =   1039.75)
  PEAK FLOW RATE(CFS) USED =   1039.75

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    108.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2520.00  DOWNSTREAM(FEET) =   2499.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.00   CHANNEL SLOPE =  0.0323
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.352
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        3.70     0.7336       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1042.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  28.82
  AVERAGE FLOW DEPTH(FEET) =   3.76   TRAVEL TIME(MIN.) =   0.38
  Tc(MIN.) =   21.87
  SUBAREA AREA(ACRES) =    3.70
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.36; LAG(HR) = 0.29
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      506.0
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    108.00 =   10069.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0319;Lca/L=0.4,n=.0286;Lca/L=0.5,n=.0262;Lca/L=0.6,n=.0245
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      73.73
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =    692.52
  TOTAL AREA(ACRES) =      506.0         PEAK FLOW RATE(CFS) =    1039.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.75   FLOW VELOCITY(FEET/SEC.) =  28.82
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    108.00 =   10719.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.352
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        3.40     0.6226       70
  SUBAREA AREA(ACRES) =    3.40
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.36; LAG(HR) = 0.29
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      509.4
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    108.00 =   10719.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0300;Lca/L=0.4,n=.0269;Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      74.20
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    697.08
  TOTAL AREA(ACRES) =      509.4   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   21.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

******************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.352
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                 B        2.80     0.8445       56
  SUBAREA AREA(ACRES) =    2.80
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.36; LAG(HR) = 0.29
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      512.2
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    108.00 =   10719.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0300;Lca/L=0.4,n=.0269;Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      74.66
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    701.10
  TOTAL AREA(ACRES) =      512.2   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   21.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

******************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.352
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.30     0.7613       56
```

```
  SUBAREA AREA(ACRES) =    2.30
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.36; LAG(HR) = 0.29
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      514.5
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    108.00 =   10719.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0300;Lca/L=0.4,n=.0269;Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      74.99
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    704.24
  TOTAL AREA(ACRES) =      514.5   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   21.87
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    107.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2499.00  DOWNSTREAM(FEET) =   2478.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   679.00   CHANNEL SLOPE =  0.0309
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.328
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        7.80     0.7604       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1046.65
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  28.44
  AVERAGE FLOW DEPTH(FEET) =   3.80   TRAVEL TIME(MIN.) =   0.40
  Tc(MIN.) =   22.27
  SUBAREA AREA(ACRES) =    7.80
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.37; LAG(HR) = 0.30
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      522.3
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    107.00 =   10719.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0309;Lca/L=0.4,n=.0277;Lca/L=0.5,n=.0255;Lca/L=0.6,n=.0237
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      76.13
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    713.12
  TOTAL AREA(ACRES) =      522.3         PEAK FLOW RATE(CFS) =    1039.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  3.79   FLOW VELOCITY(FEET/SEC.) =  28.36
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    107.00 =   11398.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.328
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
COMMERCIAL                 B        4.50     0.8721       56
SUBAREA AREA(ACRES) =    4.50
UNIT-HYDROGRAPH DATA:
 S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
 Tc(HR) = 0.37; LAG(HR) = 0.30
 UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
 LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      526.8
 COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
 LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    107.00 =   11398.00 FEET.
 EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
 Lca/L=0.3,n=.0292;Lca/L=0.4,n=.0261;Lca/L=0.5,n=.0240;Lca/L=0.6,n=.0224
 RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
 TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      76.90
UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
   3H-STORM =    719.74
TOTAL AREA(ACRES) =      526.8   PROGRAM PEAK FLOW(CFS) =    1039.75
TC(MIN.) =   22.27
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    1039.75    Tc(MIN.) =   22.27
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85   TOTAL AREA(ACRES) =      526.8

****************************************************************************
  FLOW PROCESS FROM NODE    705.00 TO NODE    704.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   669.00
  UPSTREAM ELEVATION(FEET) =   2536.00
  DOWNSTREAM ELEVATION(FEET) =   2520.00
  ELEVATION DIFFERENCE(FEET) =     16.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.084
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B        3.40     0.7174       56   13.36
  SUBAREA RUNOFF(CFS) =      7.52
  TOTAL AREA(ACRES) =      3.40   TOTAL RUNOFF(CFS) =      7.52

****************************************************************************
  FLOW PROCESS FROM NODE    704.00 TO NODE    704.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.084
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
```

```
  "S.F. 1/4 ACRE LOT"        B        1.60     0.7859       56
  SUBAREA AREA(ACRES) =    1.60   SUBAREA RUNOFF(CFS) =    3.88
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      11.40
  TC(MIN.) =   13.36

****************************************************************************
  FLOW PROCESS FROM NODE    704.00 TO NODE    703.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2520.00  DOWNSTREAM(FEET) =   2512.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   299.00   CHANNEL SLOPE =  0.0268
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.995
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B        5.00     0.7134       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.86
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   0.73
  Tc(MIN.) =   14.09
  SUBAREA AREA(ACRES) =     5.00       SUBAREA RUNOFF(CFS) =   10.68
  TOTAL AREA(ACRES) =       10.0         PEAK FLOW RATE(CFS) =      22.08
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOW VELOCITY(FEET/SEC.) =   7.34
  LONGEST FLOWPATH FROM NODE    705.00 TO NODE    703.00 =     968.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    703.00 TO NODE    702.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2512.00  DOWNSTREAM(FEET) =   2496.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   654.00   CHANNEL SLOPE =  0.0245
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.843
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B      10.00     0.7061       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.75
  AVERAGE FLOW DEPTH(FEET) =   0.72   TRAVEL TIME(MIN.) =   1.41
  Tc(MIN.) =   15.50
  SUBAREA AREA(ACRES) =    10.00       SUBAREA RUNOFF(CFS) =   20.07
  TOTAL AREA(ACRES) =       20.0         PEAK FLOW RATE(CFS) =      42.16
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOW VELOCITY(FEET/SEC.) =   8.31
  LONGEST FLOWPATH FROM NODE    705.00 TO NODE    702.00 =    1622.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    702.00 TO NODE    701.00 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2496.00  DOWNSTREAM ELEVATION(FEET) = 2492.00
  STREET LENGTH(FEET) =   787.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.69
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.72
    HALFSTREET FLOOD WIDTH(FEET) =   24.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.45
  STREET FLOW TRAVEL TIME(MIN.) =   3.85   Tc(MIN.) =   19.34
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.516
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B       10.90     0.7677       56
  SUBAREA AREA(ACRES) =   10.90      SUBAREA RUNOFF(CFS) =   21.05
  TOTAL AREA(ACRES) =       30.9        PEAK FLOW RATE(CFS) =      63.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  25.68
  FLOW VELOCITY(FEET/SEC.) =  3.62   DEPTH*VELOCITY(FT*FT/SEC.) =   2.75
  LONGEST FLOWPATH FROM NODE    705.00 TO NODE    701.00 =    2409.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    701.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.516
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B        6.80     0.6883       56
  SUBAREA AREA(ACRES) =    6.80   SUBAREA RUNOFF(CFS) =   11.78
  TOTAL AREA(ACRES) =       37.7   TOTAL RUNOFF(CFS) =      74.99
  TC(MIN.) =   19.34

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    701.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.516
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.70     0.6354       70
```

```
  SUBAREA AREA(ACRES) =    1.70   SUBAREA RUNOFF(CFS) =    2.72
  TOTAL AREA(ACRES) =       39.4   TOTAL RUNOFF(CFS) =      77.71
  TC(MIN.) =   19.34

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    701.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.516
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        2.10     0.8735       56
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    4.62
  TOTAL AREA(ACRES) =       41.5   TOTAL RUNOFF(CFS) =      82.32
  TC(MIN.) =   19.34

****************************************************************************
  FLOW PROCESS FROM NODE    701.00 TO NODE    700.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2492.00  DOWNSTREAM ELEVATION(FEET) = 2484.00
  STREET LENGTH(FEET) =   736.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      92.68
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   25.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.03
  STREET FLOW TRAVEL TIME(MIN.) =   2.31   Tc(MIN.) =   21.65
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.365
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B       12.90     0.6789       56
  SUBAREA AREA(ACRES) =   12.90      SUBAREA RUNOFF(CFS) =   20.71
  TOTAL AREA(ACRES) =       54.4        PEAK FLOW RATE(CFS) =     103.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  26.71
  FLOW VELOCITY(FEET/SEC.) =  5.48   DEPTH*VELOCITY(FT*FT/SEC.) =   4.30
  LONGEST FLOWPATH FROM NODE    705.00 TO NODE    700.00 =    3145.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    700.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.365
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        7.80     0.7342       56
  SUBAREA AREA(ACRES) =    7.80   SUBAREA RUNOFF(CFS) =   13.54
  TOTAL AREA(ACRES) =       62.2   TOTAL RUNOFF(CFS) =     116.57
  TC(MIN.) =   21.65

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    700.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.365
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  CONDOMINIUMS               B        2.10     0.8033       56
  SUBAREA AREA(ACRES) =    2.10   SUBAREA RUNOFF(CFS) =    3.99
  TOTAL AREA(ACRES) =       64.3   TOTAL RUNOFF(CFS) =     120.56
  TC(MIN.) =   21.65

****************************************************************************
  FLOW PROCESS FROM NODE    700.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2484.00  DOWNSTREAM(FEET) =  2478.00
  FLOW LENGTH(FEET) =   542.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.48
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     120.56
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   22.38
  LONGEST FLOWPATH FROM NODE    705.00 TO NODE    107.00 =    3687.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.38
  RAINFALL INTENSITY(INCH/HR) =   2.32
  TOTAL STREAM AREA(ACRES) =    64.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    120.56
  ** CONFLUENCE DATA **
  STREAM      Q         Tc      AREA      HEADWATER
  NUMBER    (CFS)     (MIN.)   (ACRES)      NODE
     1      1039.75    22.27     526.80     1806.00
     2       120.56    22.38      64.30      705.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.37; LAG(HR) = 0.30
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      591.1
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    107.00 =   11398.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
```

```
 Lca/L=0.3,n=.0292;Lca/L=0.4,n=.0261;Lca/L=0.5,n=.0240;Lca/L=0.6,n=.0224
 RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
 TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      85.50
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS):
   3H =    804.22
PEAK FLOW RATE(CFS) =     804.22
  (UPSTREAM NODE PEAK FLOW RATE(CFS) =    1039.75)
PEAK FLOW RATE(CFS) USED =    1039.75

****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    106.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2478.00  DOWNSTREAM(FEET) =   2447.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1335.00   CHANNEL SLOPE =  0.0232
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.280
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        7.30     0.8717       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1047.00
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  25.52
  AVERAGE FLOW DEPTH(FEET) =   4.06   TRAVEL TIME(MIN.) =   0.87
  Tc(MIN.) =   23.14
  SUBAREA AREA(ACRES) =    7.30
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.39; LAG(HR) = 0.31
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      598.4
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   11398.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0307;Lca/L=0.4,n=.0276;Lca/L=0.5,n=.0253;Lca/L=0.6,n=.0236
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      86.75
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    806.49
  TOTAL AREA(ACRES) =      598.4         PEAK FLOW RATE(CFS) =    1039.75
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.05   FLOW VELOCITY(FEET/SEC.) =  25.50
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.280
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        8.00     0.6166       70
  SUBAREA AREA(ACRES) =    8.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.39; LAG(HR) = 0.31
```

```
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      606.4
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0277;Lca/L=0.4,n=.0248;Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      87.87
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    817.07
  TOTAL AREA(ACRES) =      606.4   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   23.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.280
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        5.30     0.7583       56
  SUBAREA AREA(ACRES) =    5.30
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.39; LAG(HR) = 0.31
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      611.7
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0277;Lca/L=0.4,n=.0248;Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      88.64
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    824.21
  TOTAL AREA(ACRES) =      611.7   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   23.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    1039.75    Tc(MIN.) =   23.14
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85   TOTAL AREA(ACRES) =      611.7

****************************************************************************
  FLOW PROCESS FROM NODE    602.00 TO NODE    601.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   874.00
  UPSTREAM ELEVATION(FEET) =   2485.00
  DOWNSTREAM ELEVATION(FEET) =   2462.00
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  ELEVATION DIFFERENCE(FEET) =     23.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.241
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE             GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         B        5.50     0.7901       56   12.20
  SUBAREA RUNOFF(CFS) =     14.09
  TOTAL AREA(ACRES) =      5.50   TOTAL RUNOFF(CFS) =     14.09

****************************************************************************
  FLOW PROCESS FROM NODE    601.00 TO NODE    600.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2462.00  DOWNSTREAM ELEVATION(FEET) = 2454.00
  STREET LENGTH(FEET) =   773.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.60
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.70
    SPLIT DEPTH(FEET) =    0.49   SPLIT FLOOD WIDTH(FEET) =   16.52
    SPLIT FLOW(CFS) =    9.00   SPLIT VELOCITY(FEET/SEC.) =    3.09
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.21
  STREET FLOW TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =   15.69
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.823
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE             GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         B       12.30     0.7782       56
  SUBAREA AREA(ACRES) =   12.30      SUBAREA RUNOFF(CFS) =   27.02
  TOTAL AREA(ACRES) =       17.8        PEAK FLOW RATE(CFS) =      41.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  3.85   DEPTH*VELOCITY(FT*FT/SEC.) =   2.36
  LONGEST FLOWPATH FROM NODE    602.00 TO NODE    600.00 =    1647.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    600.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2454.00  DOWNSTREAM(FEET) =  2447.00
  FLOW LENGTH(FEET) =   151.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.1 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.21
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.11
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   15.84
  LONGEST FLOWPATH FROM NODE    602.00 TO NODE    106.00 =    1798.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.84
  RAINFALL INTENSITY(INCH/HR) =   2.81
  TOTAL STREAM AREA(ACRES) =    17.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.11
  ** CONFLUENCE DATA **
  STREAM      Q         Tc      AREA      HEADWATER
  NUMBER    (CFS)     (MIN.)   (ACRES)      NODE
     1      1039.75    23.14      611.70     1806.00
     2        41.11    15.84       17.80      602.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.39; LAG(HR) = 0.31
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      629.5
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0277;Lca/L=0.4,n=.0248;Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      91.22
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS):
     3H =    848.18
  PEAK FLOW RATE(CFS) =     848.18
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    1039.75)
  PEAK FLOW RATE(CFS) USED =    1039.75

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE = 152
----------------------------------------------------------------------------
  >>>>>STORE PEAK FLOWRATE TABLE TO A FILE<<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 106

****************************************************************************
  FLOW PROCESS FROM NODE    506.00 TO NODE    505.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   529.00
  UPSTREAM ELEVATION(FEET) =   2499.00
  DOWNSTREAM ELEVATION(FEET) =   2486.00
  ELEVATION DIFFERENCE(FEET) =     13.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.593
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        2.50     0.7984       56   10.12
```

```
  SUBAREA RUNOFF(CFS) =      7.17
  TOTAL AREA(ACRES) =      2.50   TOTAL RUNOFF(CFS) =      7.17

****************************************************************************
  FLOW PROCESS FROM NODE    505.00 TO NODE    505.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.593
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.50     0.6968       70
  SUBAREA AREA(ACRES) =    1.50   SUBAREA RUNOFF(CFS) =    3.76
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =      10.93
  TC(MIN.) =   10.12

****************************************************************************
  FLOW PROCESS FROM NODE    505.00 TO NODE    504.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2486.00  DOWNSTREAM ELEVATION(FEET) = 2475.00
  STREET LENGTH(FEET) =   528.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   18.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.42
  STREET FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   12.02
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.269
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.00     0.7908       56
  SUBAREA AREA(ACRES) =    4.00      SUBAREA RUNOFF(CFS) =   10.34
  TOTAL AREA(ACRES) =        8.0        PEAK FLOW RATE(CFS) =      21.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  20.17
  FLOW VELOCITY(FEET/SEC.) =  4.99   DEPTH*VELOCITY(FT*FT/SEC.) =   2.81
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    504.00 =    1057.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    504.00 TO NODE    503.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
```

```
  UPSTREAM ELEVATION(FEET) = 2475.00  DOWNSTREAM ELEVATION(FEET) = 2468.00
  STREET LENGTH(FEET) =   890.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.76
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.22
    SPLIT DEPTH(FEET) =    0.54   SPLIT FLOOD WIDTH(FEET) =   19.23
    SPLIT FLOW(CFS) =   11.56   SPLIT VELOCITY(FEET/SEC.) =    2.97
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   4.60   Tc(MIN.) =   16.62
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.735
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                  B        7.30     0.6507       70
  SUBAREA AREA(ACRES) =    7.30      SUBAREA RUNOFF(CFS) =   12.99
  TOTAL AREA(ACRES) =       15.3        PEAK FLOW RATE(CFS) =      34.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  3.29   DEPTH*VELOCITY(FT*FT/SEC.) =   2.00
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    503.00 =    1947.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    503.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.735
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                B        2.00     0.8501       56
  SUBAREA AREA(ACRES) =    2.00   SUBAREA RUNOFF(CFS) =    4.65
  TOTAL AREA(ACRES) =       17.3   TOTAL RUNOFF(CFS) =      38.91
  TC(MIN.) =   16.62

****************************************************************************
  FLOW PROCESS FROM NODE    503.00 TO NODE    502.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2468.00  DOWNSTREAM ELEVATION(FEET) = 2466.00
  STREET LENGTH(FEET) =   236.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
```

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  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.38
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.07   Tc(MIN.) =   17.69
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.643
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"         B        3.40     0.7723       56
  SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    6.94
  TOTAL AREA(ACRES) =       20.7        PEAK FLOW RATE(CFS) =      45.85

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  3.78   DEPTH*VELOCITY(FT*FT/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    502.00 =    2183.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    502.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.643
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                    B        6.60     0.6445       70
  SUBAREA AREA(ACRES) =    6.60   SUBAREA RUNOFF(CFS) =   11.24
  TOTAL AREA(ACRES) =       27.3   TOTAL RUNOFF(CFS) =      57.09
  TC(MIN.) =   17.69

****************************************************************************
  FLOW PROCESS FROM NODE    502.00 TO NODE    501.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2466.00  DOWNSTREAM ELEVATION(FEET) = 2464.00
  STREET LENGTH(FEET) =   661.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.37
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET FLOOD WIDTH(FEET) =   28.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.50
  STREET FLOW TRAVEL TIME(MIN.) =   3.63   Tc(MIN.) =   21.32
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.385
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        6.90     0.7627       56
  SUBAREA AREA(ACRES) =    6.90      SUBAREA RUNOFF(CFS) =   12.55
  TOTAL AREA(ACRES) =       34.2        PEAK FLOW RATE(CFS) =      69.64

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  29.25
  FLOW VELOCITY(FEET/SEC.) =  3.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.64
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    501.00 =    2844.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.385
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B       11.70     0.6253       70
  SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   17.45
  TOTAL AREA(ACRES) =       45.9   TOTAL RUNOFF(CFS) =      87.09
  TC(MIN.) =   21.32

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    501.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.385
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                 B        1.40     0.8451       56
  SUBAREA AREA(ACRES) =    1.40   SUBAREA RUNOFF(CFS) =    2.82
  TOTAL AREA(ACRES) =       47.3   TOTAL RUNOFF(CFS) =      89.91
  TC(MIN.) =   21.32

****************************************************************************
  FLOW PROCESS FROM NODE    501.00 TO NODE    500.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2464.00  DOWNSTREAM ELEVATION(FEET) = 2456.00
  STREET LENGTH(FEET) =   696.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      97.20
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   25.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.19
  STREET FLOW TRAVEL TIME(MIN.) =   2.11   Tc(MIN.) =   23.44
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.264
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        8.50     0.7576       56
  SUBAREA AREA(ACRES) =    8.50      SUBAREA RUNOFF(CFS) =   14.58
  TOTAL AREA(ACRES) =       55.8        PEAK FLOW RATE(CFS) =     104.49

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  26.56
  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   4.38
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    500.00 =    3540.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.264
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.00     0.6153       70
  SUBAREA AREA(ACRES) =    2.00   SUBAREA RUNOFF(CFS) =    2.79
  TOTAL AREA(ACRES) =       57.8   TOTAL RUNOFF(CFS) =     107.28
  TC(MIN.) =   23.44

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.264
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        9.50     0.8715       56
  SUBAREA AREA(ACRES) =    9.50   SUBAREA RUNOFF(CFS) =   18.75
  TOTAL AREA(ACRES) =       67.3   TOTAL RUNOFF(CFS) =     126.02
  TC(MIN.) =   23.44

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    400.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2456.00  DOWNSTREAM ELEVATION(FEET) = 2431.00
```

```
  STREET LENGTH(FEET) =  1352.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   27.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.79
  STREET FLOW TRAVEL TIME(MIN.) =   3.10   Tc(MIN.) =   26.53
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.115
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  MOBILE HOME PARK           B      17.30     0.8255       56
  SUBAREA AREA(ACRES) =   17.30      SUBAREA RUNOFF(CFS) =   30.20
  TOTAL AREA(ACRES) =       84.6        PEAK FLOW RATE(CFS) =     156.22

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  28.17
  FLOW VELOCITY(FEET/SEC.) =  7.51   DEPTH*VELOCITY(FT*FT/SEC.) =   6.16
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    400.00 =    4892.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.115
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.00     0.7509       56
  SUBAREA AREA(ACRES) =    3.00   SUBAREA RUNOFF(CFS) =    4.76
  TOTAL AREA(ACRES) =       87.6   TOTAL RUNOFF(CFS) =     160.99
  TC(MIN.) =   26.53

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.53
  RAINFALL INTENSITY(INCH/HR) =   2.11
  TOTAL STREAM AREA(ACRES) =    87.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    160.99

****************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    405.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   709.00
  UPSTREAM ELEVATION(FEET) =   2469.00
  DOWNSTREAM ELEVATION(FEET) =   2451.00
  ELEVATION DIFFERENCE(FEET) =    18.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.381
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        4.40     0.7935       56   11.31
  SUBAREA RUNOFF(CFS) =     11.80
  TOTAL AREA(ACRES) =      4.40   TOTAL RUNOFF(CFS) =     11.80

****************************************************************************
  FLOW PROCESS FROM NODE    405.00 TO NODE    404.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2451.00  DOWNSTREAM(FEET) =   2439.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   619.00   CHANNEL SLOPE =  0.0194
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =   8.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.120
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        1.90     0.7869       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.14
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.80
  AVERAGE FLOW DEPTH(FEET) =   0.55   TRAVEL TIME(MIN.) =   1.78
  Tc(MIN.) =   13.09
  SUBAREA AREA(ACRES) =     1.90       SUBAREA RUNOFF(CFS) =    4.66
  TOTAL AREA(ACRES) =        6.3         PEAK FLOW RATE(CFS) =      16.47
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   6.02
  LONGEST FLOWPATH FROM NODE    406.00 TO NODE    404.00 =    1328.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.120
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B        3.10     0.7190       56
  SUBAREA AREA(ACRES) =    3.10   SUBAREA RUNOFF(CFS) =    6.95
  TOTAL AREA(ACRES) =        9.4   TOTAL RUNOFF(CFS) =      23.42
  TC(MIN.) =   13.09

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    403.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) = 2439.00  DOWNSTREAM ELEVATION(FEET) = 2437.00
  STREET LENGTH(FEET) =   294.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.61
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.60   FLOOD WIDTH(FEET) =   22.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    3.00
    SPLIT DEPTH(FEET) =    0.58   SPLIT FLOOD WIDTH(FEET) =   21.11
    SPLIT FLOW(CFS) =   13.54   SPLIT VELOCITY(FEET/SEC.) =    2.91
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.79
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   14.72
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.924
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"           B        5.00     0.7101       56
  SUBAREA AREA(ACRES) =    5.00      SUBAREA RUNOFF(CFS) =   10.38
  TOTAL AREA(ACRES) =       14.4        PEAK FLOW RATE(CFS) =      33.80

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.00
  FLOW VELOCITY(FEET/SEC.) =  3.13   DEPTH*VELOCITY(FT*FT/SEC.) =   1.93
  LONGEST FLOWPATH FROM NODE    406.00 TO NODE    403.00 =    1622.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    402.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 2437.00  DOWNSTREAM ELEVATION(FEET) = 2436.00
  STREET LENGTH(FEET) =   331.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.34
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.73
    HALFSTREET FLOOD WIDTH(FEET) =   24.61
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```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.97
  STREET FLOW TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =   16.77
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.722
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B       10.00     0.6999       56
  SUBAREA AREA(ACRES) =   10.00      SUBAREA RUNOFF(CFS) =   19.05
  TOTAL AREA(ACRES) =       24.4        PEAK FLOW RATE(CFS) =      52.85

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  26.42
  FLOW VELOCITY(FEET/SEC.) =  2.87   DEPTH*VELOCITY(FT*FT/SEC.) =   2.23
  LONGEST FLOWPATH FROM NODE    406.00 TO NODE    402.00 =    1953.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    401.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2436.00  DOWNSTREAM ELEVATION(FEET) = 2435.00
  STREET LENGTH(FEET) =   939.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.22
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.97
    HALFSTREET FLOOD WIDTH(FEET) =   34.18
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.06
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.00
  STREET FLOW TRAVEL TIME(MIN.) =   7.59   Tc(MIN.) =   24.36
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.216
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  MOBILE HOME PARK           B       10.20     0.8278       56
  SUBAREA AREA(ACRES) =   10.20      SUBAREA RUNOFF(CFS) =   18.71
  TOTAL AREA(ACRES) =       34.6        PEAK FLOW RATE(CFS) =      71.56

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.02   HALFSTREET FLOOD WIDTH(FEET) =  36.08
  FLOW VELOCITY(FEET/SEC.) =  2.13   DEPTH*VELOCITY(FT*FT/SEC.) =   2.17
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  939.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   20.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    401.00
  LONGEST FLOWPATH FROM NODE    406.00 TO NODE    401.00 =    2892.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.216
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.70     0.7556       56
  SUBAREA AREA(ACRES) =    3.70   SUBAREA RUNOFF(CFS) =    6.20
  TOTAL AREA(ACRES) =       38.3   TOTAL RUNOFF(CFS) =      77.76
  TC(MIN.) =   24.36

******************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.216
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1-ACRE LOT"          B        6.20     0.6689       56
  SUBAREA AREA(ACRES) =    6.20   SUBAREA RUNOFF(CFS) =    9.19
  TOTAL AREA(ACRES) =       44.5   TOTAL RUNOFF(CFS) =      86.95
  TC(MIN.) =   24.36

******************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    400.00 IS CODE =  62
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 2435.00  DOWNSTREAM ELEVATION(FEET) = 2431.00
  STREET LENGTH(FEET) =   247.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 22.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.03
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   23.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.16
  STREET FLOW TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   25.06
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.182
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.10     0.7540       56
  SUBAREA AREA(ACRES) =    0.10      SUBAREA RUNOFF(CFS) =    0.16
  TOTAL AREA(ACRES) =       44.6        PEAK FLOW RATE(CFS) =      87.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  23.44
```

```
  FLOW VELOCITY(FEET/SEC.) =  5.92   DEPTH*VELOCITY(FT*FT/SEC.) =   4.16
  LONGEST FLOWPATH FROM NODE    406.00 TO NODE    400.00 =    3139.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.06
  RAINFALL INTENSITY(INCH/HR) =   2.18
  TOTAL STREAM AREA(ACRES) =    44.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     87.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1      160.99    26.53        2.115         87.60
     2       87.11    25.06        2.182         44.60

 *********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 **************************************************************************

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1      239.15    25.06       2.182
     2      245.40    26.53       2.115

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     245.40   Tc(MIN.) =   26.53
  TOTAL AREA(ACRES) =      132.2
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    400.00 =    4892.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2431.00  DOWNSTREAM(FEET) =  2422.00
  FLOW LENGTH(FEET) =   359.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  41.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.81
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     245.40
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   26.83
  LONGEST FLOWPATH FROM NODE    506.00 TO NODE    105.00 =    5251.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 106
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1039.75    Tc(MIN.) =   23.14
  UNIFORM MEAN SOIL-LOSS(INCH/HR) =  0.17
  TOTAL AREA(ACRES) =      629.5
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     1039.75    Tc(MIN.) =   23.14
  UNIFORM MEAN SOIL-LOSS(INCH/HR) =  0.17
  TOTAL AREA(ACRES) =      629.5
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    106.00 =   12733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2447.00  DOWNSTREAM(FEET) =   2422.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1430.00   CHANNEL SLOPE =  0.0175
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        9.00     0.7560       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1047.32
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  22.98
  AVERAGE FLOW DEPTH(FEET) =   4.34   TRAVEL TIME(MIN.) =   1.04
  Tc(MIN.) =   24.18
  SUBAREA AREA(ACRES) =    9.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      638.5
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   12733.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0292;Lca/L=0.4,n=.0262;Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      92.53
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    849.09
  TOTAL AREA(ACRES) =      638.5         PEAK FLOW RATE(CFS) =    1039.75
```

```
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.32   FLOW VELOCITY(FEET/SEC.) =  22.94
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        2.20     0.6119       70
  SUBAREA AREA(ACRES) =    2.20
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      640.7
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      92.83
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    851.96
  TOTAL AREA(ACRES) =      640.7   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   24.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        C        0.90     0.8046       69
  SUBAREA AREA(ACRES) =    0.90
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      641.6
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      92.98
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    853.21
  TOTAL AREA(ACRES) =      641.6   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   24.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        8.30     0.8712       56
  SUBAREA AREA(ACRES) =    8.30
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      649.9
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      94.40
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    865.15
  TOTAL AREA(ACRES) =      649.9   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   24.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  CONDOMINIUMS               B        1.20     0.7992       56
  SUBAREA AREA(ACRES) =    1.20
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      651.1
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      94.59
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =    866.79
  TOTAL AREA(ACRES) =      651.1   PROGRAM PEAK FLOW(CFS) =    1039.75
  TC(MIN.) =   24.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.225
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
```

```
     LAND USE            GROUP   (ACRES)  Coefficient    CN
 CONDOMINIUMS              C        0.40    0.8332       69
 SUBAREA AREA(ACRES) =    0.40
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.40; LAG(HR) = 0.32
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      651.5
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =      94.65
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =    867.35
 TOTAL AREA(ACRES) =      651.5   PROGRAM PEAK FLOW(CFS) =    1039.75
 TC(MIN.) =   24.18
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE(CFS) =     1039.75    Tc(MIN.) =   24.18
 UNIFORM MEAN SOIL-LOSS(INCH/HR) =  0.85
 TOTAL AREA(ACRES) =      651.5
 LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1      245.40    26.83       2.102      132.20
 LONGEST FLOWPATH FROM NODE    506.00 TO NODE    105.00 =    5251.00 FEET.
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.40; LAG(HR) = 0.32
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      783.7
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    105.00 =   14163.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     114.03
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =   1043.76
 PEAK FLOW RATE(CFS) =    1043.76

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    105.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2422.00  DOWNSTREAM(FEET) =   2420.81
  CHANNEL LENGTH THRU SUBAREA(FEET) =    67.00   CHANNEL SLOPE =  0.0178
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.223
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        0.10     0.6117       70
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1043.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  23.10
  AVERAGE FLOW DEPTH(FEET) =   4.32   TRAVEL TIME(MIN.) =   0.05
  Tc(MIN.) =   24.23
  SUBAREA AREA(ACRES) =    0.10
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.40; LAG(HR) = 0.32
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      783.8
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    104.00 =   14163.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     114.04
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1043.35
  TOTAL AREA(ACRES) =      783.8         PEAK FLOW RATE(CFS) =    1043.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  4.32   FLOW VELOCITY(FEET/SEC.) =  23.09
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    104.00 =   14230.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    103.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2420.81  DOWNSTREAM(FEET) =   2405.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   701.00   CHANNEL SLOPE =  0.0226
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   1.200
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  12.30
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.173
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.00     0.7536       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1046.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.36
  AVERAGE FLOW DEPTH(FEET) =   3.76   TRAVEL TIME(MIN.) =   1.03
  Tc(MIN.) =   25.26
  SUBAREA AREA(ACRES) =    3.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.42; LAG(HR) = 0.34
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      786.8
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14230.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
```

```
  Lca/L=0.3,n=.0277;Lca/L=0.4,n=.0248;Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     114.48
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =   1025.84
 TOTAL AREA(ACRES) =      786.8         PEAK FLOW RATE(CFS) =    1043.76
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  3.76   FLOW VELOCITY(FEET/SEC.) =  11.34
 LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14931.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.173
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        C        0.90     0.8027       69
 SUBAREA AREA(ACRES) =    0.90
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.42; LAG(HR) = 0.34
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      787.7
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14931.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     114.62
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =   1027.06
 TOTAL AREA(ACRES) =      787.7   PROGRAM PEAK FLOW(CFS) =    1043.76
 TC(MIN.) =   25.26
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.173
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
      LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"        D        0.10     0.8236       75
 SUBAREA AREA(ACRES) =    0.10
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.42; LAG(HR) = 0.34
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      787.8
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14931.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     114.64
```

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  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1027.20
  TOTAL AREA(ACRES) =      787.8   PROGRAM PEAK FLOW(CFS) =    1043.76
  TC(MIN.) =   25.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.173
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        3.40     0.6072       70
  SUBAREA AREA(ACRES) =    3.40
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.42; LAG(HR) = 0.34
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      791.2
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14931.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     115.11
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1031.53
  TOTAL AREA(ACRES) =      791.2   PROGRAM PEAK FLOW(CFS) =    1043.76
  TC(MIN.) =   25.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.173
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   C        0.20     0.7055       80
  SUBAREA AREA(ACRES) =    0.20
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.42; LAG(HR) = 0.34
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      791.4
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    103.00 =   14931.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0264;Lca/L=0.4,n=.0237;Lca/L=0.5,n=.0218;Lca/L=0.6,n=.0203
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     115.14
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1031.80
  TOTAL AREA(ACRES) =      791.4   PROGRAM PEAK FLOW(CFS) =    1043.76
  TC(MIN.) =   25.26
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    102.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2405.00  DOWNSTREAM(FEET) =  2402.00
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.024
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.27
  (PIPE FLOW VELOCITY CORRESPONDING TO FULL PIPE CAPACITY FLOW)
  GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1043.76
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   25.39
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    102.00 =   15021.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2402.00  DOWNSTREAM(FEET) =   2383.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1076.00   CHANNEL SLOPE =  0.0177
  CHANNEL BASE(FEET) =    7.40   "Z" FACTOR =   1.240
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  10.25
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.095
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        3.40     0.8700       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1046.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.24
  AVERAGE FLOW DEPTH(FEET) =   6.18   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =   26.99
  SUBAREA AREA(ACRES) =    3.40
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.45; LAG(HR) = 0.36
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      794.8
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   15021.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0283;Lca/L=0.4,n=.0254;Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     115.73
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1016.39
  TOTAL AREA(ACRES) =      794.8         PEAK FLOW RATE(CFS) =    1043.76
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  6.17   FLOW VELOCITY(FEET/SEC.) =  11.24
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.095
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
```

```
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 COMMERCIAL                C       0.70     0.8800       69
 SUBAREA AREA(ACRES) =    0.70
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.45; LAG(HR) = 0.36
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      795.5
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     115.85
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =   1017.37
 TOTAL AREA(ACRES) =      795.5   PROGRAM PEAK FLOW(CFS) =    1043.76
 TC(MIN.) =   26.99
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.095
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 COMMERCIAL                D       1.10     0.8842       75
 SUBAREA AREA(ACRES) =    1.10
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.45; LAG(HR) = 0.36
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      796.6
  COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.
  EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
  Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
  RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
  TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     116.05
 UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
    3H-STORM =   1018.92
 TOTAL AREA(ACRES) =      796.6   PROGRAM PEAK FLOW(CFS) =    1043.76
 TC(MIN.) =   26.99
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.095
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
 RESIDENTIAL
 "S.F. 1/4 ACRE LOT"       B       0.20     0.7500       56
 SUBAREA AREA(ACRES) =    0.20
 UNIT-HYDROGRAPH DATA:
  S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
  Tc(HR) = 0.45; LAG(HR) = 0.36
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
```

```
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      796.8
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     116.07
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1019.18
  TOTAL AREA(ACRES) =      796.8   PROGRAM PEAK FLOW(CFS) =    1043.76
  TC(MIN.) =   26.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.095
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        D        1.00     0.8212       75
  SUBAREA AREA(ACRES) =    1.00
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.45; LAG(HR) = 0.36
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.17
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      797.8
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     116.24
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1020.53
  TOTAL AREA(ACRES) =      797.8   PROGRAM PEAK FLOW(CFS) =    1043.76
  TC(MIN.) =   26.99
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    1043.76    Tc(MIN.) =   26.99
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.17
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85   TOTAL AREA(ACRES) =      797.8

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    203.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   976.00
  UPSTREAM ELEVATION(FEET) =   2433.00
  DOWNSTREAM ELEVATION(FEET) =   2422.00
  ELEVATION DIFFERENCE(FEET) =     11.00
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.769
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
     LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
RESIDENTIAL
"S.F. 1/2 ACRE LOT"        B       1.00     0.7518       56   16.25
SUBAREA RUNOFF(CFS) =      2.08
TOTAL AREA(ACRES) =      1.00   TOTAL RUNOFF(CFS) =      2.08

****************************************************************************
FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.769
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
MOBILE HOME PARK           B       0.20     0.8382       56
SUBAREA AREA(ACRES) =    0.20   SUBAREA RUNOFF(CFS) =    0.46
TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       2.55
TC(MIN.) =   16.25

****************************************************************************
FLOW PROCESS FROM NODE    203.00 TO NODE    202.00 IS CODE =  62
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 2422.00  DOWNSTREAM ELEVATION(FEET) = 2413.00
STREET LENGTH(FEET) =   442.00   CURB HEIGHT(INCHES) =  8.0
STREET HALFWIDTH(FEET) = 32.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.25
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.30
  HALFSTREET FLOOD WIDTH(FEET) =    7.31
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.89
STREET FLOW TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   18.75
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.559
SUBAREA Tc AND LOSS RATE DATA(AMC III):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
     LAND USE            GROUP   (ACRES)   Coefficient    CN
MOBILE HOME PARK           B       1.60     0.8346       56
SUBAREA AREA(ACRES) =    1.60      SUBAREA RUNOFF(CFS) =    3.42
TOTAL AREA(ACRES) =        2.8        PEAK FLOW RATE(CFS) =       5.96

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =   8.71
FLOW VELOCITY(FEET/SEC.) =  3.14   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
LONGEST FLOWPATH FROM NODE    204.00 TO NODE    202.00 =    1418.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
```

```
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.559
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/2 ACRE LOT"        B        0.30     0.7432       56
  SUBAREA AREA(ACRES) =    0.30   SUBAREA RUNOFF(CFS) =    0.57
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       6.53
  TC(MIN.) =   18.75

*******************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    201.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) = 2413.00  DOWNSTREAM ELEVATION(FEET) = 2404.00
  STREET LENGTH(FEET) =   618.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.88
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   11.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.15
  STREET FLOW TRAVEL TIME(MIN.) =   3.45   Tc(MIN.) =   22.20
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.332
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        2.30     0.8721       56
  SUBAREA AREA(ACRES) =    2.30      SUBAREA RUNOFF(CFS) =    4.68
  TOTAL AREA(ACRES) =        5.4        PEAK FLOW RATE(CFS) =      11.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  12.58
  FLOW VELOCITY(FEET/SEC.) =  3.16   DEPTH*VELOCITY(FT*FT/SEC.) =   1.30
  LONGEST FLOWPATH FROM NODE    204.00 TO NODE    201.00 =    2036.00 FEET.

*******************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.332
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  NATURAL POOR COVER
  "BARREN"                   B        1.50     0.6210       70
  SUBAREA AREA(ACRES) =    1.50   SUBAREA RUNOFF(CFS) =    2.17
```

```
  TOTAL AREA(ACRES) =        6.9   TOTAL RUNOFF(CFS) =      13.39
  TC(MIN.) =   22.20

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    201.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.332
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  MOBILE HOME PARK           B        1.20     0.8303       56
  SUBAREA AREA(ACRES) =    1.20   SUBAREA RUNOFF(CFS) =    2.32
  TOTAL AREA(ACRES) =        8.1   TOTAL RUNOFF(CFS) =      15.71
  TC(MIN.) =   22.20

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    200.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2404.00  DOWNSTREAM ELEVATION(FEET) = 2391.00
  STREET LENGTH(FEET) =   540.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   14.62
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   24.24
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.222
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        5.00     0.8712       56
  SUBAREA AREA(ACRES) =    5.00      SUBAREA RUNOFF(CFS) =    9.68
  TOTAL AREA(ACRES) =       13.1        PEAK FLOW RATE(CFS) =      25.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  15.96
  FLOW VELOCITY(FEET/SEC.) =  4.64   DEPTH*VELOCITY(FT*FT/SEC.) =   2.22
  LONGEST FLOWPATH FROM NODE    204.00 TO NODE    200.00 =    2576.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    101.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2391.00  DOWNSTREAM(FEET) =  2383.00
  FLOW LENGTH(FEET) =    42.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.14
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.39
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   24.27
  LONGEST FLOWPATH FROM NODE    204.00 TO NODE    101.00 =    2618.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.27
  RAINFALL INTENSITY(INCH/HR) =   2.22
  TOTAL STREAM AREA(ACRES) =    13.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.39

****************************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   582.00
  UPSTREAM ELEVATION(FEET) =   2414.00
  DOWNSTREAM ELEVATION(FEET) =   2406.00
  ELEVATION DIFFERENCE(FEET) =      8.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.300
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS   Tc
       LAND USE            GROUP   (ACRES)   Coefficient    CN  (MIN.)
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        3.30     0.7916       56   11.81
  SUBAREA RUNOFF(CFS) =      8.62
  TOTAL AREA(ACRES) =      3.30   TOTAL RUNOFF(CFS) =      8.62

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.300
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        C        0.60     0.8309       69
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    1.65
  TOTAL AREA(ACRES) =        3.9   TOTAL RUNOFF(CFS) =      10.27
  TC(MIN.) =   11.81

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.300
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
```

```
  "S.F. 1/4 ACRE LOT"        D        0.30     0.8466       75
  SUBAREA AREA(ACRES) =    0.30   SUBAREA RUNOFF(CFS) =    0.84
  TOTAL AREA(ACRES) =        4.2   TOTAL RUNOFF(CFS) =      11.10
  TC(MIN.) =   11.81

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.300
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                 B        0.70     0.8566       56
  SUBAREA AREA(ACRES) =    0.70   SUBAREA RUNOFF(CFS) =    1.98
  TOTAL AREA(ACRES) =        4.9   TOTAL RUNOFF(CFS) =      13.08
  TC(MIN.) =   11.81

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.300
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                 C        0.10     0.8723       69
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.29
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      13.37
  TC(MIN.) =   11.81

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    300.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2406.00  DOWNSTREAM ELEVATION(FEET) = 2391.00
  STREET LENGTH(FEET) =   747.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  12.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.025
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.95
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   18.14
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.39
  STREET FLOW TRAVEL TIME(MIN.) =   2.72   Tc(MIN.) =   14.53
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        2.00     0.8764       56
```

```
  SUBAREA AREA(ACRES) =    2.00      SUBAREA RUNOFF(CFS) =    5.16
  TOTAL AREA(ACRES) =        7.0        PEAK FLOW RATE(CFS) =      18.53

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  19.26
  FLOW VELOCITY(FEET/SEC.) =  4.75   DEPTH*VELOCITY(FT*FT/SEC.) =   2.58
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    300.00 =    1329.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 C        0.60     0.8848       69
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    1.56
  TOTAL AREA(ACRES) =        7.6   TOTAL RUNOFF(CFS) =      20.10
  TC(MIN.) =   14.53

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 D        0.40     0.8882       75
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    1.05
  TOTAL AREA(ACRES) =        8.0   TOTAL RUNOFF(CFS) =      21.14
  TC(MIN.) =   14.53

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  APARTMENTS                 B        0.40     0.8528       56
  SUBAREA AREA(ACRES) =    0.40   SUBAREA RUNOFF(CFS) =    1.00
  TOTAL AREA(ACRES) =        8.4   TOTAL RUNOFF(CFS) =      22.15
  TC(MIN.) =   14.53

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        B        0.80     0.7819       56
  SUBAREA AREA(ACRES) =    0.80   SUBAREA RUNOFF(CFS) =    1.84
  TOTAL AREA(ACRES) =        9.2   TOTAL RUNOFF(CFS) =      23.99
  TC(MIN.) =   14.53
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        C        0.60     0.8239       69
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    1.46
  TOTAL AREA(ACRES) =        9.8   TOTAL RUNOFF(CFS) =      25.45
  TC(MIN.) =   14.53

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.945
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  RESIDENTIAL
  "S.F. 1/4 ACRE LOT"        D        0.20     0.8410       75
  SUBAREA AREA(ACRES) =    0.20   SUBAREA RUNOFF(CFS) =    0.50
  TOTAL AREA(ACRES) =       10.0   TOTAL RUNOFF(CFS) =      25.94
  TC(MIN.) =   14.53

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    101.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2391.00  DOWNSTREAM(FEET) =  2383.00
  FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.98
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.94
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   14.55
  LONGEST FLOWPATH FROM NODE    302.00 TO NODE    101.00 =    1362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.55
  RAINFALL INTENSITY(INCH/HR) =   2.94
  TOTAL STREAM AREA(ACRES) =    10.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.94
  ** CONFLUENCE DATA **
  STREAM      Q         Tc      AREA      HEADWATER
  NUMBER    (CFS)     (MIN.)   (ACRES)      NODE
     1      1043.76    26.99      797.80     1806.00
     2        25.39    24.27       13.10      204.00
     3        25.94    14.55       10.00      302.00
```

```
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.45; LAG(HR) = 0.36
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.16
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      820.9
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    101.00 =   16097.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     119.95
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS):
     3H =   1051.48
  PEAK FLOW RATE(CFS) =    1051.48

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    100.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2383.00  DOWNSTREAM(FEET) =  2370.00
  FLOW LENGTH(FEET) =   161.00   MANNING'S N =  0.015
  GIVEN BOX BASEWIDTH(FEET) =   6.00   GIVEN BOX HEIGHT(FEET) =   6.00
  FLOWDEPTH IN BOX IS  4.27 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  41.06
  BOX-FLOW(CFS) =    1051.48
  BOX-FLOW TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   27.05
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE    100.00 =   16258.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE     99.00 IS CODE =  51
----------------------------------------------------------------------------
               >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2370.00  DOWNSTREAM(FEET) =   2366.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.00   CHANNEL SLOPE =  0.0143
  CHANNEL BASE(FEET) =   14.00   "Z" FACTOR =   1.070
  MANNING'S FACTOR = 0.040   MAXIMUM DEPTH(FEET) =  21.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.073
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 B        1.70     0.8698       56
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    1053.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  10.25
  AVERAGE FLOW DEPTH(FEET) =   5.24   TRAVEL TIME(MIN.) =   0.45
  Tc(MIN.) =   27.50
  SUBAREA AREA(ACRES) =    1.70
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.46; LAG(HR) = 0.37
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.16
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      822.6
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE     99.00 =   16258.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0270;Lca/L=0.4,n=.0242;Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0207
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     120.25
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1046.35
  TOTAL AREA(ACRES) =      822.6         PEAK FLOW RATE(CFS) =    1051.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  5.24   FLOW VELOCITY(FEET/SEC.) =  10.24
  LONGEST FLOWPATH FROM NODE   1806.00 TO NODE     99.00 =   16537.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     99.00 TO NODE     99.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.073
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 C        0.40     0.8798       69
  SUBAREA AREA(ACRES) =    0.40
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.46; LAG(HR) = 0.37
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.16
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      823.0
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE     99.00 =   16537.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     120.32
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1046.90
  TOTAL AREA(ACRES) =      823.0   PROGRAM PEAK FLOW(CFS) =    1051.48
  TC(MIN.) =   27.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     99.00 TO NODE     99.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.073
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Runoff      SCS
       LAND USE            GROUP   (ACRES)   Coefficient    CN
  COMMERCIAL                 D        0.30     0.8841       75
  SUBAREA AREA(ACRES) =    0.30
  UNIT-HYDROGRAPH DATA:
   S-GRAPH: VALLEY=100.0%;FOOTHILL=  0.0%;MOUNTAIN=  0.0%;DESERT=  0.0%
   Tc(HR) = 0.46; LAG(HR) = 0.37
   UNIFORM MEAN SOIL-LOSS(INCH/HOUR) USING: F = Fp(1.0 - 0.9Ai) =  0.16
   LOW LOSS RATE PERCENT(DECIMAL) = 0.85    TOTAL AREA(ACRES) =      823.3
   COUNTY OF RIVERSIDE DEPTH-AREA FACTORS USED WITH AMC III CONDITION.
   LONGEST FLOWPATH FROM NODE   1806.00 TO NODE     99.00 =   16537.00 FEET.
   EQUIVALENT BASIN FACTOR (VERSUS Lca/L RATIO) APPROXIMATIONS:
   Lca/L=0.3,n=.0265;Lca/L=0.4,n=.0238;Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204
   RAINFALL(INCH):  3H= 2.25 for  5-MINUTE PERIOD
   TIME OF PEAK FLOW(HR) =  2.75  RUNOFF VOLUME(AF) =     120.37
  UNIT-HYDROGRAPH PEAK FLOW RATES(CFS):
     3H-STORM =   1047.33
  TOTAL AREA(ACRES) =      823.3   PROGRAM PEAK FLOW(CFS) =    1051.48
  TC(MIN.) =   27.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      823.3  TC(MIN.) =     27.50
  UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.16
```

```
  LOW LOSS RATE PERCENT(DECIMAL) = 0.85
  PEAK FLOW RATE(CFS)   =   1051.48
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

APPENDIX B.2
CALIMESA CHANNEL HYDROLOGY
ULTIMATE CONDITION WITH FLOW SPLIT

SYNTETIC UNIT HYDROGRAPH METHOD

```
____________________________________________________________________________
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2016 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 23.0)
                 Release Date: 07/01/2016  License ID 1670

                          Analysis prepared by:

                           TKE Engineering, Inc.
                             2305 Chicago Ave.
                            Riverside, Ca. 92507


 ************************** DESCRIPTION OF STUDY **************************
* FLOW ROUTING WITH 53.1 AC-FT RETARDING BASIN - 2-42IN RCP OUTLET         *
* INCLUDES 90/10 FLOW SPLIT AT NODE 994                                    *
*                                                                          *
 **************************************************************************

  FILE NAME: CCRRT4.DAT
  TIME/DATE OF STUDY: 09:36 04/13/2018


****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =   11398.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    4724.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     384.000 FEET
         BASIN FACTOR = 0.025
         WATERSHED AREA =     591.100 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.288 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.162
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9977


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  28.944


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	2.730	195.148
2	12.324	685.851
3	29.998	1263.438
4	50.257	1448.231
5	63.405	939.943
6	71.104	550.332
7	76.269	369.261
8	80.138	276.581
9	83.186	217.857
10	85.669	177.537
11	87.692	144.576
12	89.400	122.071
13	90.875	105.449
14	92.160	91.918
15	93.248	77.735
16	94.250	71.609
17	95.105	61.175
18	95.927	58.764
19	96.533	43.327
20	97.095	40.172
21	97.658	40.183
22	98.079	30.139
23	98.289	14.992
24	98.497	14.857
25	98.704	14.838
26	98.912	14.857
27	99.120	14.858
28	99.328	14.857
29	99.536	14.857
30	99.743	14.857
31	99.951	14.857
32	100.000	3.486

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0135	0.0157
2	0.0292	0.0135	0.0157
3	0.0247	0.0123	0.0123
4	0.0337	0.0135	0.0202
5	0.0337	0.0135	0.0202
6	0.0404	0.0135	0.0269
7	0.0337	0.0135	0.0202
8	0.0404	0.0135	0.0269
9	0.0404	0.0135	0.0269
10	0.0337	0.0135	0.0202
11	0.0359	0.0135	0.0224
12	0.0404	0.0135	0.0269
13	0.0494	0.0135	0.0359
14	0.0494	0.0135	0.0359
15	0.0494	0.0135	0.0359
16	0.0449	0.0135	0.0314
17	0.0584	0.0135	0.0449
18	0.0606	0.0135	0.0471
19	0.0539	0.0135	0.0404
20	0.0606	0.0135	0.0471
21	0.0741	0.0135	0.0606
22	0.0696	0.0135	0.0561
23	0.0651	0.0135	0.0516
24	0.0673	0.0135	0.0538
25	0.0696	0.0135	0.0561
26	0.0943	0.0135	0.0808
27	0.1122	0.0135	0.0987
28	0.0786	0.0135	0.0651
29	0.1526	0.0135	0.1391
30	0.1639	0.0135	0.1504
31	0.1841	0.0135	0.1706
32	0.1324	0.0135	0.1189
33	0.0449	0.0135	0.0314
34	0.0404	0.0135	0.0269
35	0.0404	0.0135	0.0269
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.24
TOTAL SOIL-LOSS(INCHES) = 0.48
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.77

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 23.5634
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 86.9650

```
============================================================================

                       3 - H O U R   S T O R M
                     R U N O F F   H Y D R O G R A P H

============================================================================
                HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      225.0     450.0     675.0     900.0
----------------------------------------------------------------------------
   0.083      0.0211      3.06  Q         .         .         .         .
   0.167      0.1162     13.81  Q         .         .         .         .
   0.250      0.3432     32.96  VQ        .         .         .         .
   0.333      0.7213     54.90  V Q       .         .         .         .
   0.417      1.2089     70.79  V  Q      .         .         .         .
   0.500      1.7997     85.79  V  Q      .         .         .         .
   0.583      2.5096    103.08  .V  Q     .         .         .         .
   0.667      3.3232    118.13  .V   Q    .         .         .         .
   0.750      4.2218    130.48  .V   Q    .         .         .         .
   0.833      5.1791    139.00  . V   Q   .         .         .         .
   0.917      6.1823    145.65  . V   Q   .         .         .         .
   1.000      7.1995    147.70  .  V  Q   .         .         .         .
   1.083      8.2411    151.25  .  V  Q   .         .         .         .
   1.167      9.3724    164.26  .   V  Q  .         .         .         .
   1.250     10.6391    183.92  .   V   Q .         .         .         .
   1.333     12.0296    201.91  .    V  Q .         .         .         .
   1.417     13.5021    213.79  .     V  Q.         .         .         .
   1.500     15.0565    225.70  .     V   Q         .         .         .
   1.583     16.7236    242.06  .      V  Q         .         .         .
   1.667     18.5231    261.29  .       V .Q        .         .         .
   1.750     20.4325    277.25  .        V. Q       .         .         .
   1.833     22.4654    295.17  .         V  Q      .         .         .
   1.917     24.6621    318.96  .         .V  Q     .         .         .
   2.000     26.9924    338.36  .         . V  Q    .         .         .
   2.083     29.3798    346.65  .         .  V Q    .         .         .
   2.167     31.8378    356.90  .         .   VQ    .         .         .
   2.250     34.4905    385.17  .         .    V Q  .         .         .
   2.333     37.4523    430.06  .         .      V Q.         .         .
   2.417     40.7988    485.90  .         .       V .Q        .         .
   2.500     44.5868    550.03  .         .         V   Q     .         .
   2.583     48.9979    640.49  .         .         . V     Q .         .
   2.667     54.2050    756.07  .         .         .   V     .  Q      .
   2.750     59.8003    812.44  .         .         .      V  .     Q   .
   2.833     65.0824    766.97  .         .         .        V.   Q     .
   2.917     69.4326    631.64  .         .         .       Q .V        .
   3.000     72.7611    483.31  .         .         .Q        .  V      .
   3.083     75.3689    378.65  .         .     Q   .         .   V     .
   3.167     77.4312    299.44  .         .  Q      .         .    V    .
   3.250     79.0191    230.55  .         Q         .         .     V   .
   3.333     80.2570    179.75  .      Q  .         .         .     V   .
   3.417     81.2620    145.93  .     Q   .         .         .      V  .
   3.500     82.1028    122.08  .    Q    .         .         .      V  .
   3.583     82.8171    103.71  .   Q     .         .         .       V .
   3.667     83.4310     89.15  .  Q      .         .         .       V .
   3.750     83.9590     76.66  .  Q      .         .         .       V .
   3.833     84.4211     67.10  . Q       .         .         .       V .
   3.917     84.8227     58.31  . Q       .         .         .        V.
   4.000     85.1672     50.01  . Q       .         .         .        V.
   4.083     85.4619     42.80  .Q        .         .         .        V.
   4.167     85.7153     36.79  .Q        .         .         .        V.
   4.250     85.9305     31.25  .Q        .         .         .        V.
   4.333     86.1078     25.74  .Q        .         .         .        V.
```

```
   4.417     86.2494     20.57  Q         .         .         .        V.
   4.500     86.3697     17.46  Q         .         .         .        V.
   4.583     86.4791     15.89  Q         .         .         .        V.
   4.667     86.5781     14.38  Q         .         .         .        V.
   4.750     86.6662     12.79  Q         .         .         .        V.
   4.833     86.7439     11.28  Q         .         .         .        V.
   4.917     86.8141     10.19  Q         .         .         .        V.
   5.000     86.8718      8.39  Q         .         .         .        V.
   5.083     86.9145      6.19  Q         .         .         .        V.
   5.167     86.9401      3.73  Q         .         .         .        V.
   5.250     86.9524      1.78  Q         .         .         .        V.
   5.333     86.9594      1.01  Q         .         .         .        V.
   5.417     86.9634      0.59  Q         .         .         .        V.
   5.500     86.9648      0.19  Q         .         .         .        V.
   5.583     86.9649      0.02  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
             0%                              335.0
            10%                              195.0
            20%                              135.0
            30%                               95.0
            40%                               70.0
            50%                               45.0
            60%                               30.0
            70%                               25.0
            80%                               15.0
            90%                               15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    107.00 TO NODE   1062.00 IS CODE = 5.2
 ----------------------------------------------------------------------------
   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
 ============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    4.00     CHANNEL Z =  1.50
           UPSTREAM ELEVATION(FT) =    2478.00
           DOWNSTREAM ELEVATION(FT) =    2475.00
           CHANNEL LENGTH(FT) =     124.00     MANNING'S FACTOR = 0.015
           CONSTANT LOSS RATE(CFS) =    0.00


         CHANNEL ROUTING COEFFICIENT ESTIMATED:
           MAXIMUM INFLOW(CFS) =   812.44
           AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW =   617.43
           CHANNEL NORMAL VELOCITY FOR Q =   617.43 CFS =  22.62 FPS
           ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.930
```

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	3.06	3.01	3.01
0.167	13.81	13.63	13.63
0.250	32.96	32.64	32.64
0.333	54.90	54.53	54.53
0.417	70.79	70.52	70.52
0.500	85.79	85.54	85.54
0.583	103.08	102.78	102.78
0.667	118.13	117.88	117.88
0.750	130.48	130.27	130.27
0.833	139.00	138.86	138.86
0.917	145.65	145.54	145.54
1.000	147.70	147.66	147.66
1.083	151.25	151.19	151.19
1.167	164.26	164.04	164.04
1.250	183.92	183.59	183.59
1.333	201.91	201.60	201.60
1.417	213.79	213.59	213.59
1.500	225.70	225.50	225.50
1.583	242.06	241.78	241.78
1.667	261.29	260.96	260.96
1.750	277.25	276.98	276.98
1.833	295.17	294.86	294.86
1.917	318.96	318.56	318.56
2.000	338.36	338.03	338.03
2.083	346.65	346.51	346.51
2.167	356.90	356.73	356.73
2.250	385.17	384.69	384.69
2.333	430.06	429.30	429.30
2.417	485.90	484.95	484.95
2.500	550.03	548.94	548.94
2.583	640.49	638.95	638.95
2.667	756.07	754.11	754.11
2.750	812.44	811.48	811.48
2.833	766.97	767.74	767.74
2.917	631.64	633.94	633.94
3.000	483.31	485.83	485.83
3.083	378.65	380.43	380.43
3.167	299.44	300.79	300.79
3.250	230.55	231.72	231.72
3.333	179.75	180.61	180.61
3.417	145.93	146.50	146.50
3.500	122.08	122.49	122.49
3.583	103.71	104.02	104.02
3.667	89.15	89.40	89.40
3.750	76.66	76.88	76.88
3.833	67.10	67.26	67.26
3.917	58.31	58.46	58.46
4.000	50.01	50.15	50.15
4.083	42.80	42.92	42.92
4.167	36.79	36.90	36.90
4.250	31.25	31.34	31.34
4.333	25.74	25.83	25.83
4.417	20.57	20.66	20.66
4.500	17.46	17.51	17.51

```
           4.583        15.89       15.91       15.91
           4.667        14.38       14.41       14.41
           4.750        12.79       12.82       12.82
           4.833        11.28       11.30       11.30
           4.917        10.19       10.21       10.21
           5.000         8.39        8.42        8.42
           5.083         6.19        6.23        6.23
           5.167         3.73        3.77        3.77
           5.250         1.78        1.81        1.81
           5.333         1.01        1.02        1.02
           5.417         0.59        0.60        0.60
           5.500         0.19        0.20        0.20
           5.583         0.02        0.03        0.03
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     86.965 AF
    OUTFLOW VOLUME =     86.965 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      225.0     450.0     675.0     900.0
----------------------------------------------------------------------------
   0.083      0.0207      3.01  Q         .         .         .         .
   0.167      0.1145     13.63  Q         .         .         .         .
   0.250      0.3393     32.64  VQ        .         .         .         .
   0.333      0.7149     54.53  V Q       .         .         .         .
   0.417      1.2006     70.52  V  Q      .         .         .         .
   0.500      1.7897     85.54  V  Q      .         .         .         .
   0.583      2.4975    102.78  .V  Q     .         .         .         .
   0.667      3.3093    117.88  .V   Q    .         .         .         .
   0.750      4.2065    130.27  .V   Q    .         .         .         .
   0.833      5.1629    138.86  . V   Q   .         .         .         .
   0.917      6.1652    145.54  . V   Q   .         .         .         .
   1.000      7.1822    147.66  .  V  Q   .         .         .         .
   1.083      8.2234    151.19  .  V  Q   .         .         .         .
   1.167      9.3532    164.04  .   V  Q  .         .         .         .
   1.250     10.6176    183.59  .   V   Q .         .         .         .
   1.333     12.0060    201.60  .    V  Q .         .         .         .
   1.417     13.4770    213.59  .     V  Q.         .         .         .
   1.500     15.0301    225.50  .     V   Q         .         .         .
   1.583     16.6952    241.78  .      V  Q         .         .         .
   1.667     18.4925    260.96  .       V .Q        .         .         .
   1.750     20.4001    276.98  .        V. Q       .         .         .
   1.833     22.4308    294.86  .         V  Q      .         .         .
   1.917     24.6247    318.56  .         .V  Q     .         .         .
   2.000     26.9528    338.03  .         . V  Q    .         .         .
   2.083     29.3392    346.51  .         .  V Q    .         .         .
   2.167     31.7960    356.73  .         .   VQ    .         .         .
   2.250     34.4454    384.69  .         .    V Q  .         .         .
   2.333     37.4020    429.30  .         .      V Q.         .         .
   2.417     40.7419    484.95  .         .       V .Q        .         .
   2.500     44.5224    548.94  .         .         V   Q     .         .
   2.583     48.9229    638.95  .         .         . V     Q .         .
   2.667     54.1165    754.11  .         .         .   V     .  Q      .
```

```
    2.750     59.7052    811.48  .         .         .      V  .     Q   .
    2.833     64.9927    767.74  .         .         .        V.   Q     .
    2.917     69.3586    633.94  .         .         .       Q .V        .
    3.000     72.7046    485.83  .         .         .Q        .  V      .
    3.083     75.3246    380.43  .         .     Q   .         .   V     .
    3.167     77.3962    300.79  .         .  Q      .         .    V    .
    3.250     78.9921    231.72  .         Q         .         .     V   .
    3.333     80.2360    180.61  .       Q .         .         .     V   .
    3.417     81.2450    146.50  .     Q   .         .         .      V  .
    3.500     82.0885    122.49  .    Q    .         .         .      V  .
    3.583     82.8049    104.02  .   Q     .         .         .       V .
    3.667     83.4206     89.40  .  Q      .         .         .       V .
    3.750     83.9501     76.88  .  Q      .         .         .       V .
    3.833     84.4133     67.26  . Q       .         .         .       V .
    3.917     84.8159     58.46  . Q       .         .         .        V.
    4.000     85.1613     50.15  . Q       .         .         .        V.
    4.083     85.4569     42.92  .Q        .         .         .        V.
    4.167     85.7110     36.90  .Q        .         .         .        V.
    4.250     85.9269     31.34  .Q        .         .         .        V.
    4.333     86.1048     25.83  .Q        .         .         .        V.
    4.417     86.2471     20.66  Q         .         .         .        V.
    4.500     86.3677     17.51  Q         .         .         .        V.
    4.583     86.4773     15.91  Q         .         .         .        V.
    4.667     86.5765     14.41  Q         .         .         .        V.
    4.750     86.6647     12.82  Q         .         .         .        V.
    4.833     86.7426     11.30  Q         .         .         .        V.
    4.917     86.8129     10.21  Q         .         .         .        V.
    5.000     86.8709      8.42  Q         .         .         .        V.
    5.083     86.9138      6.23  Q         .         .         .        V.
    5.167     86.9397      3.77  Q         .         .         .        V.
    5.250     86.9522      1.81  Q         .         .         .        V.
    5.333     86.9593      1.02  Q         .         .         .        V.
    5.417     86.9634      0.60  Q         .         .         .        V.
    5.500     86.9648      0.20  Q         .         .         .        V.
    5.583     86.9650      0.03  Q         .         .         .         V
    5.667     86.9650      0.00  Q         .         .         .         V
----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                             340.0
             10%                             195.0
             20%                             135.0
             30%                              95.0
             40%                              70.0
             50%                              45.0
             60%                              30.0
             70%                              25.0
             80%                              15.0
             90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE = 3.1
 ----------------------------------------------------------------------------
   >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
 ============================================================================
```

```
              INFLOW
            (STREAM 1)
                 |
                 |
                 V                __effective depth
             -----------          |   (and volume)
            |           |    |    |
            |           |    |....V........
            | detention |<-->|           outflow
            |   basin   |    |........._______
             -----------     |    ^    |  \
                 |           |  dead   |   basin outlet
                 V           | storage |
              OUTFLOW         ---------
            (STREAM 1)
```

ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 12.250
SPECIFIED DEAD STORAGE(AF) FILLED = 12.250
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	4.00	134.00	19.910
3	5.00	175.00	22.000
4	10.00	307.00	33.560
5	14.00	380.00	44.230
6	15.00	397.00	47.110
7	16.00	1042.25	50.070
8	17.00	2101.22	53.120

===
MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.083	12.250	3.01	0.00	0.00	0.1	0.020
0.167	12.250	13.63	0.00	0.02	0.4	0.111
0.250	12.250	32.64	0.00	0.07	1.5	0.326
0.333	12.250	54.53	0.00	0.14	3.4	0.678
0.417	12.250	70.52	0.00	0.23	6.1	1.122

0.500	12.250	85.54	0.00	0.33	9.3	1.647
0.583	12.250	102.78	0.00	0.45	13.2	2.264
0.667	12.250	117.88	0.00	0.59	17.6	2.955
0.750	12.250	130.27	0.00	0.74	22.4	3.698
0.833	12.250	138.86	0.00	0.90	27.5	4.465
0.917	12.250	145.54	0.00	1.05	32.7	5.242
1.000	12.250	147.66	0.00	1.21	37.8	5.999
1.083	12.250	151.19	0.00	1.36	42.9	6.745
1.167	12.250	164.04	0.00	1.52	48.1	7.543
1.250	12.250	183.59	0.00	1.70	53.8	8.437
1.333	12.250	201.60	0.00	1.89	60.1	9.412
1.417	12.250	213.59	0.00	2.09	66.8	10.424
1.500	12.250	225.50	0.00	2.30	73.7	11.469
1.583	12.250	241.78	0.00	2.53	80.9	12.577
1.667	12.250	260.96	0.00	2.77	88.6	13.764
1.750	12.250	276.98	0.00	3.01	96.8	15.005
1.833	12.250	294.86	0.00	3.28	105.4	16.310
1.917	12.250	318.56	0.00	3.56	114.5	17.715
2.000	12.250	338.03	0.00	3.85	124.2	19.188
2.083	12.250	346.51	0.00	4.34	138.5	20.620
2.167	12.250	356.73	0.00	4.98	161.1	21.967
2.250	12.250	384.69	0.00	5.59	182.4	23.360
2.333	12.250	429.30	0.00	6.27	199.6	24.942
2.417	12.250	484.95	0.00	7.06	219.1	26.774
2.500	12.250	548.94	0.00	7.98	241.6	28.890
2.583	12.250	638.95	0.00	9.08	268.3	31.443
2.667	12.250	754.11	0.00	10.38	298.4	34.582
2.750	12.250	811.48	0.00	11.64	325.4	37.929
2.833	12.250	767.74	0.00	12.72	346.8	40.828
2.917	12.250	633.94	0.00	13.42	363.1	42.693
3.000	12.250	485.83	0.00	13.72	372.2	43.476

3.083	12.250	380.43	0.00	13.73	375.0	43.514
3.167	12.250	300.79	0.00	13.54	373.4	43.014
3.250	12.250	231.72	0.00	13.19	368.5	42.072
3.333	12.250	180.61	0.00	12.73	361.0	40.830
3.417	12.250	146.50	0.00	12.20	351.9	39.415
3.500	12.250	122.49	0.00	11.63	341.9	37.904
3.583	12.250	104.02	0.00	11.04	331.4	36.338
3.667	12.250	89.40	0.00	10.44	320.6	34.746
3.750	12.250	76.88	0.00	9.82	308.7	33.150
3.833	12.250	67.26	0.00	9.15	293.4	31.592
3.917	12.250	58.46	0.00	8.50	276.0	30.094
4.000	12.250	50.15	0.00	7.88	259.2	28.654
4.083	12.250	42.92	0.00	7.28	243.1	27.276
4.167	12.250	36.90	0.00	6.71	227.7	25.961
4.250	12.250	31.34	0.00	6.17	213.1	24.710
4.333	12.250	25.83	0.00	5.66	199.1	23.516
4.417	12.250	20.66	0.00	5.16	185.8	22.379
4.500	12.250	17.51	0.00	4.68	170.5	21.325
4.583	12.250	15.91	0.00	4.23	152.5	20.384
4.667	12.250	14.41	0.00	3.93	137.4	19.537
4.750	12.250	12.82	0.00	3.76	128.8	18.738
4.833	12.250	11.30	0.00	3.61	123.5	17.965
4.917	12.250	10.21	0.00	3.46	118.4	17.220
5.000	12.250	8.42	0.00	3.31	113.5	16.497
5.083	12.250	6.23	0.00	3.17	108.7	15.791
5.167	12.250	3.77	0.00	3.03	104.0	15.101
5.250	12.250	1.81	0.00	2.90	99.4	14.429
5.333	12.250	1.02	0.00	2.77	94.9	13.783
5.417	12.250	0.60	0.00	2.64	90.7	13.162
5.500	12.250	0.20	0.00	2.52	86.6	12.567
5.583	12.250	0.03	0.00	2.41	82.7	11.998

5.667	12.250	0.00	0.00	2.30	78.9	11.455
5.750	12.250	0.00	0.00	2.20	75.3	10.936
5.833	12.250	0.00	0.00	2.10	71.9	10.440
5.917	12.250	0.00	0.00	2.00	68.7	9.967
6.000	12.250	0.00	0.00	1.91	65.6	9.516
6.083	12.250	0.00	0.00	1.83	62.6	9.085
6.167	12.250	0.00	0.00	1.74	59.8	8.673
6.250	12.250	0.00	0.00	1.66	57.1	8.280
6.333	12.250	0.00	0.00	1.59	54.5	7.905
6.417	12.250	0.00	0.00	1.52	52.0	7.547
6.500	12.250	0.00	0.00	1.45	49.6	7.205
6.583	12.250	0.00	0.00	1.38	47.4	6.879
6.667	12.250	0.00	0.00	1.32	45.2	6.567
6.750	12.250	0.00	0.00	1.26	43.2	6.270
6.833	12.250	0.00	0.00	1.20	41.2	5.986
6.917	12.250	0.00	0.00	1.15	39.4	5.714
7.000	12.250	0.00	0.00	1.10	37.6	5.456
7.083	12.250	0.00	0.00	1.05	35.9	5.208
7.167	12.250	0.00	0.00	1.00	34.3	4.972
7.250	12.250	0.00	0.00	0.95	32.7	4.747
7.333	12.250	0.00	0.00	0.91	31.2	4.532
7.417	12.250	0.00	0.00	0.87	29.8	4.327
7.500	12.250	0.00	0.00	0.83	28.5	4.131
7.583	12.250	0.00	0.00	0.79	27.2	3.944
7.667	12.250	0.00	0.00	0.76	25.9	3.765
7.750	12.250	0.00	0.00	0.72	24.8	3.594
7.833	12.250	0.00	0.00	0.69	23.6	3.432
7.917	12.250	0.00	0.00	0.66	22.6	3.276
8.000	12.250	0.00	0.00	0.63	21.5	3.128
8.083	12.250	0.00	0.00	0.60	20.6	2.986
8.167	12.250	0.00	0.00	0.57	19.6	2.851

8.250	12.250	0.00	0.00	0.55	18.8	2.722
8.333	12.250	0.00	0.00	0.52	17.9	2.598
8.417	12.250	0.00	0.00	0.50	17.1	2.481
8.500	12.250	0.00	0.00	0.48	16.3	2.368
8.583	12.250	0.00	0.00	0.45	15.6	2.261
8.667	12.250	0.00	0.00	0.43	14.9	2.159
8.750	12.250	0.00	0.00	0.41	14.2	2.061
8.833	12.250	0.00	0.00	0.40	13.6	1.967
8.917	12.250	0.00	0.00	0.38	12.9	1.878
9.000	12.250	0.00	0.00	0.36	12.4	1.793
9.083	12.250	0.00	0.00	0.34	11.8	1.712
9.167	12.250	0.00	0.00	0.33	11.3	1.634
9.250	12.250	0.00	0.00	0.31	10.8	1.560
9.333	12.250	0.00	0.00	0.30	10.3	1.490
9.417	12.250	0.00	0.00	0.29	9.8	1.422
9.500	12.250	0.00	0.00	0.27	9.4	1.358
9.583	12.250	0.00	0.00	0.26	8.9	1.296
9.667	12.250	0.00	0.00	0.25	8.5	1.238
9.750	12.250	0.00	0.00	0.24	8.1	1.181
9.833	12.250	0.00	0.00	0.23	7.8	1.128
9.917	12.250	0.00	0.00	0.22	7.4	1.077
10.000	12.250	0.00	0.00	0.21	7.1	1.028
10.083	12.250	0.00	0.00	0.20	6.8	0.981
10.167	12.250	0.00	0.00	0.19	6.5	0.937
10.250	12.250	0.00	0.00	0.18	6.2	0.895
10.333	12.250	0.00	0.00	0.17	5.9	0.854
10.417	12.250	0.00	0.00	0.16	5.6	0.815
10.500	12.250	0.00	0.00	0.16	5.4	0.778
10.583	12.250	0.00	0.00	0.15	5.1	0.743
10.667	12.250	0.00	0.00	0.14	4.9	0.709
10.750	12.250	0.00	0.00	0.14	4.7	0.677

10.833	12.250	0.00	0.00	0.13	4.5	0.647
10.917	12.250	0.00	0.00	0.12	4.3	0.617
11.000	12.250	0.00	0.00	0.12	4.1	0.589
11.083	12.250	0.00	0.00	0.11	3.9	0.563
11.167	12.250	0.00	0.00	0.11	3.7	0.537
11.250	12.250	0.00	0.00	0.10	3.5	0.513
11.333	12.250	0.00	0.00	0.10	3.4	0.490
11.417	12.250	0.00	0.00	0.09	3.2	0.467
11.500	12.250	0.00	0.00	0.09	3.1	0.446
11.583	12.250	0.00	0.00	0.09	2.9	0.426
11.667	12.250	0.00	0.00	0.08	2.8	0.407
11.750	12.250	0.00	0.00	0.08	2.7	0.388
11.833	12.250	0.00	0.00	0.07	2.6	0.371
11.917	12.250	0.00	0.00	0.07	2.4	0.354
12.000	12.250	0.00	0.00	0.07	2.3	0.338
12.083	12.250	0.00	0.00	0.06	2.2	0.323
12.167	12.250	0.00	0.00	0.06	2.1	0.308
12.250	12.250	0.00	0.00	0.06	2.0	0.294
12.333	12.250	0.00	0.00	0.06	1.9	0.281
12.417	12.250	0.00	0.00	0.05	1.8	0.268
12.500	12.250	0.00	0.00	0.05	1.8	0.256
12.583	12.250	0.00	0.00	0.05	1.7	0.244
12.667	12.250	0.00	0.00	0.05	1.6	0.233
12.750	12.250	0.00	0.00	0.04	1.5	0.223
12.833	12.250	0.00	0.00	0.04	1.5	0.213
12.917	12.250	0.00	0.00	0.04	1.4	0.203
13.000	12.250	0.00	0.00	0.04	1.3	0.194
13.083	12.250	0.00	0.00	0.04	1.3	0.185
13.167	12.250	0.00	0.00	0.04	1.2	0.177
13.250	12.250	0.00	0.00	0.03	1.2	0.169
13.333	12.250	0.00	0.00	0.03	1.1	0.161

13.417	12.250	0.00	0.00	0.03	1.1	0.154
13.500	12.250	0.00	0.00	0.03	1.0	0.147
13.583	12.250	0.00	0.00	0.03	1.0	0.140
13.667	12.250	0.00	0.00	0.03	0.9	0.134
13.750	12.250	0.00	0.00	0.03	0.9	0.128
13.833	12.250	0.00	0.00	0.02	0.8	0.122
13.917	12.250	0.00	0.00	0.02	0.8	0.116
14.000	12.250	0.00	0.00	0.02	0.8	0.111
14.083	12.250	0.00	0.00	0.02	0.7	0.106
14.167	12.250	0.00	0.00	0.02	0.7	0.101
14.250	12.250	0.00	0.00	0.02	0.7	0.097
14.333	12.250	0.00	0.00	0.02	0.6	0.092
14.417	12.250	0.00	0.00	0.02	0.6	0.088
14.500	12.250	0.00	0.00	0.02	0.6	0.084
14.583	12.250	0.00	0.00	0.02	0.6	0.080
14.667	12.250	0.00	0.00	0.02	0.5	0.077
14.750	12.250	0.00	0.00	0.01	0.5	0.073
14.833	12.250	0.00	0.00	0.01	0.5	0.070
14.917	12.250	0.00	0.00	0.01	0.5	0.067
15.000	12.250	0.00	0.00	0.01	0.4	0.064
15.083	12.250	0.00	0.00	0.01	0.4	0.061
15.167	12.250	0.00	0.00	0.01	0.4	0.058
15.250	12.250	0.00	0.00	0.01	0.4	0.055
15.333	12.250	0.00	0.00	0.01	0.4	0.053
15.417	12.250	0.00	0.00	0.01	0.3	0.051
15.500	12.250	0.00	0.00	0.01	0.3	0.048
15.583	12.250	0.00	0.00	0.01	0.3	0.046
15.667	12.250	0.00	0.00	0.01	0.3	0.044
15.750	12.250	0.00	0.00	0.01	0.3	0.042
15.833	12.250	0.00	0.00	0.01	0.3	0.040
15.917	12.250	0.00	0.00	0.01	0.3	0.038

16.000	12.250	0.00	0.00	0.01	0.3	0.037
16.083	12.250	0.00	0.00	0.01	0.2	0.035
16.167	12.250	0.00	0.00	0.01	0.2	0.033
16.250	12.250	0.00	0.00	0.01	0.2	0.032
16.333	12.250	0.00	0.00	0.01	0.2	0.030
16.417	12.250	0.00	0.00	0.01	0.2	0.029
16.500	12.250	0.00	0.00	0.01	0.2	0.028
16.583	12.250	0.00	0.00	0.01	0.2	0.026
16.667	12.250	0.00	0.00	0.01	0.2	0.025
16.750	12.250	0.00	0.00	0.00	0.2	0.024
16.833	12.250	0.00	0.00	0.00	0.2	0.023
16.917	12.250	0.00	0.00	0.00	0.2	0.022
17.000	12.250	0.00	0.00	0.00	0.1	0.021
17.083	12.250	0.00	0.00	0.00	0.1	0.020
17.167	12.250	0.00	0.00	0.00	0.1	0.019
17.250	12.250	0.00	0.00	0.00	0.1	0.018
17.333	12.250	0.00	0.00	0.00	0.1	0.017
17.417	12.250	0.00	0.00	0.00	0.1	0.017
17.500	12.250	0.00	0.00	0.00	0.1	0.016
17.583	12.250	0.00	0.00	0.00	0.1	0.015
17.667	12.250	0.00	0.00	0.00	0.1	0.014
17.750	12.250	0.00	0.00	0.00	0.1	0.014
17.833	12.250	0.00	0.00	0.00	0.1	0.013
17.917	12.250	0.00	0.00	0.00	0.1	0.013
18.000	12.250	0.00	0.00	0.00	0.1	0.012
18.083	12.250	0.00	0.00	0.00	0.1	0.011
18.167	12.250	0.00	0.00	0.00	0.1	0.011
18.250	12.250	0.00	0.00	0.00	0.1	0.010
18.333	12.250	0.00	0.00	0.00	0.1	0.010
18.417	12.250	0.00	0.00	0.00	0.1	0.010
18.500	12.250	0.00	0.00	0.00	0.1	0.009

18.583	12.250	0.00	0.00	0.00	0.1	0.009
18.667	12.250	0.00	0.00	0.00	0.1	0.008
18.750	12.250	0.00	0.00	0.00	0.1	0.008
18.833	12.250	0.00	0.00	0.00	0.1	0.008
18.917	12.250	0.00	0.00	0.00	0.0	0.007
19.000	12.250	0.00	0.00	0.00	0.0	0.007
19.083	12.250	0.00	0.00	0.00	0.0	0.007
19.167	12.250	0.00	0.00	0.00	0.0	0.006
19.250	12.250	0.00	0.00	0.00	0.0	0.006
19.333	12.250	0.00	0.00	0.00	0.0	0.006
19.417	12.250	0.00	0.00	0.00	0.0	0.005
19.500	12.250	0.00	0.00	0.00	0.0	0.005
19.583	12.250	0.00	0.00	0.00	0.0	0.005
19.667	12.250	0.00	0.00	0.00	0.0	0.005
19.750	12.250	0.00	0.00	0.00	0.0	0.005
19.833	12.250	0.00	0.00	0.00	0.0	0.004
19.917	12.250	0.00	0.00	0.00	0.0	0.004
20.000	12.250	0.00	0.00	0.00	0.0	0.004
20.083	12.250	0.00	0.00	0.00	0.0	0.004
20.167	12.250	0.00	0.00	0.00	0.0	0.004
20.250	12.250	0.00	0.00	0.00	0.0	0.003
20.333	12.250	0.00	0.00	0.00	0.0	0.003
20.417	12.250	0.00	0.00	0.00	0.0	0.003
20.500	12.250	0.00	0.00	0.00	0.0	0.003
20.583	12.250	0.00	0.00	0.00	0.0	0.003
20.667	12.250	0.00	0.00	0.00	0.0	0.003
20.750	12.250	0.00	0.00	0.00	0.0	0.003
20.833	12.250	0.00	0.00	0.00	0.0	0.002
20.917	12.250	0.00	0.00	0.00	0.0	0.002
21.000	12.250	0.00	0.00	0.00	0.0	0.002
21.083	12.250	0.00	0.00	0.00	0.0	0.002

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           21.167       12.250     0.00     0.00      0.00      0.0
0.002
           21.250       12.250     0.00     0.00      0.00      0.0
0.002
           21.333       12.250     0.00     0.00      0.00      0.0
0.002
           21.417       12.250     0.00     0.00      0.00      0.0
0.002
           21.500       12.250     0.00     0.00      0.00      0.0
0.002
           21.583       12.250     0.00     0.00      0.00      0.0
0.002
           21.667       12.250     0.00     0.00      0.00      0.0
0.002
           21.750       12.250     0.00     0.00      0.00      0.0
0.001
           21.833       12.250     0.00     0.00      0.00      0.0
0.001
           21.917       12.250     0.00     0.00      0.00      0.0
0.001
 ----------------------------------------------------------------------------
   PROCESS SUMMARY OF STORAGE:
     INFLOW  VOLUME =     86.965 AF
     BASIN  STORAGE =     12.250 AF (WITH     12.250 AF INITIALLY FILLED)
     OUTFLOW VOLUME =     86.965 AF
     LOSS    VOLUME =      0.000 AF


 ****************************************************************************
   FLOW PROCESS FROM NODE   1061.00 TO NODE   1061.00 IS CODE =  11
 ----------------------------------------------------------------------------
   >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
 ============================================================================

             STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
         (Note: Time indicated is at END of Each Unit Intervals)
 ----------------------------------------------------------------------------
  TIME(HRS) VOLUME(AF)   Q(CFS) 0.      100.0     200.0     300.0     400.0
 ----------------------------------------------------------------------------
    0.083      0.0005      0.07  Q         .         .         .         .
    0.167      0.0035      0.44  Q         .         .         .         .
    0.250      0.0136      1.47  Q         .         .         .         .
    0.333      0.0369      3.38  Q         .         .         .         .
    0.417      0.0786      6.06  Q         .         .         .         .
    0.500      0.1428      9.32  Q         .         .         .         .
    0.583      0.2334     13.16  VQ        .         .         .         .
    0.667      0.3544     17.56  VQ        .         .         .         .
    0.750      0.5086     22.39  V Q       .         .         .         .
    0.833      0.6978     27.47  V Q       .         .         .         .
    0.917      0.9227     32.67  V  Q      .         .         .         .
    1.000      1.1833     37.83  V  Q      .         .         .         .
    1.083      1.4786     42.88  V   Q     .         .         .         .
    1.167      1.8098     48.08  V   Q     .         .         .         .
    1.250      2.1801     53.78  .V   Q    .         .         .         .
    1.333      2.5938     60.07  .V    Q   .         .         .         .
    1.417      3.0535     66.75  .V    Q   .         .         .         .
    1.500      3.5609     73.67  .V     Q  .         .         .         .
    1.583      4.1182     80.92  .V      Q .         .         .         .
    1.667      4.7287     88.64  . V     Q .         .         .         .
    1.750      5.3954     96.81  . V      Q.         .         .         .
    1.833      6.1211    105.38  . V       Q        .         .         .
    1.917      6.9097    114.50  .  V      .Q       .         .         .
    2.000      7.7650    124.18  .  V      . Q      .         .         .
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2.083      8.7191    138.54  .   V     .  Q      .         .         .
2.167      9.8289    161.14  .   V     .     Q   .         .         .
2.250     11.0854    182.44  .    V    .       Q .         .         .
2.333     12.4598    199.56  .    V    .        Q.         .         .
2.417     13.9684    219.05  .     V   .         .Q        .         .
2.500     15.6322    241.59  .      V  .         .   Q     .         .
2.583     17.4797    268.25  .       V .         .     Q   .         .
2.667     19.5349    298.41  .       V .         .        Q.         .
2.750     21.7762    325.44  .         V         .         . Q       .
2.833     24.1647    346.81  .         .V        .         .   Q     .
2.917     26.6654    363.11  .         . V       .         .     Q   .
3.000     29.2285    372.16  .         .  V      .         .      Q  .
3.083     31.8109    374.97  .         .   V     .         .      Q  .
3.167     34.3825    373.39  .         .    V    .         .      Q  .
3.250     36.9201    368.46  .         .     V   .         .     Q   .
3.333     39.4062    360.99  .         .       V .         .     Q   .
3.417     41.8297    351.90  .         .        V.         .    Q    .
3.500     44.1844    341.89  .         .         V         .   Q     .
3.583     46.4665    331.36  .         .         .V        .  Q      .
3.667     48.6742    320.56  .         .         . V       . Q       .
3.750     50.8004    308.72  .         .         .  V      Q         .
3.833     52.8212    293.42  .         .         .   V    Q.         .
3.917     54.7218    275.98  .         .         .    V Q  .         .
4.000     56.5070    259.20  .         .         .    Q    .         .
4.083     58.1813    243.11  .         .         .   Q V   .         .
4.167     59.7497    227.74  .         .         . Q    V  .         .
4.250     61.2173    213.09  .         .         .Q      V .         .
4.333     62.5887    199.13  .         .        Q.       V .         .
4.417     63.8684    185.82  .         .       Q .        V.         .
4.500     65.0429    170.54  .         .      Q  .        V.         .
4.583     66.0933    152.52  .         .    Q    .         V         .
4.667     67.0396    137.39  .         .  Q      .         V         .
4.750     67.9266    128.80  .         . Q       .         .V        .
4.833     68.7773    123.51  .         . Q       .         .V        .
4.917     69.5927    118.40  .         .Q        .         . V       .
5.000     70.3741    113.46  .         .Q        .         . V       .
5.083     71.1224    108.65  .         Q         .         . V       .
5.167     71.8384    103.96  .         Q         .         .  V      .
5.250     72.5228     99.37  .        Q.         .         .  V      .
5.333     73.1766     94.94  .        Q.         .         .  V      .
5.417     73.8011     90.67  .        Q.         .         .  V      .
5.500     74.3974     86.58  .       Q .         .         .   V     .
5.583     74.9667     82.67  .       Q .         .         .   V     .
5.667     75.5103     78.92  .      Q  .         .         .   V     .
5.750     76.0292     75.35  .      Q  .         .         .   V     .
5.833     76.5246     71.93  .      Q  .         .         .    V    .
5.917     76.9976     68.67  .     Q   .         .         .    V    .
6.000     77.4491     65.56  .     Q   .         .         .    V    .
6.083     77.8802     62.59  .     Q   .         .         .    V    .
6.167     78.2917     59.76  .    Q    .         .         .     V   .
6.250     78.6847     57.05  .    Q    .         .         .     V   .
6.333     79.0598     54.47  .    Q    .         .         .     V   .
6.417     79.4179     52.00  .    Q    .         .         .     V   .
6.500     79.7598     49.64  .   Q     .         .         .     V   .
6.583     80.0862     47.39  .   Q     .         .         .     V   .
6.667     80.3978     45.25  .   Q     .         .         .     V   .
6.750     80.6953     43.20  .   Q     .         .         .      V  .
6.833     80.9793     41.24  .   Q     .         .         .      V  .
6.917     81.2505     39.37  .  Q      .         .         .      V  .
7.000     81.5094     37.59  .  Q      .         .         .      V  .
7.083     81.7565     35.89  .  Q      .         .         .      V  .
7.167     81.9925     34.26  .  Q      .         .         .      V  .
7.250     82.2177     32.71  .  Q      .         .         .      V  .
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7.333	82.4328	31.23	. Q	.	.	.	V .
7.417	82.6381	29.81	. Q	.	.	.	V .
7.500	82.8341	28.46	. Q	.	.	.	V .
7.583	83.0212	27.17	. Q	.	.	.	V .
7.667	83.1999	25.94	. Q	.	.	.	V .
7.750	83.3705	24.77	. Q	.	.	.	V .
7.833	83.5333	23.64	. Q	.	.	.	V .
7.917	83.6888	22.57	. Q	.	.	.	V .
8.000	83.8372	21.55	. Q	.	.	.	V .
8.083	83.9789	20.57	. Q	.	.	.	V .
8.167	84.1141	19.64	.Q	.	.	.	V .
8.250	84.2433	18.75	.Q	.	.	.	V .
8.333	84.3666	17.90	.Q	.	.	.	V .
8.417	84.4843	17.09	.Q	.	.	.	V .
8.500	84.5967	16.32	.Q	.	.	.	V .
8.583	84.7039	15.58	.Q	.	.	.	V .
8.667	84.8064	14.87	.Q	.	.	.	V.
8.750	84.9042	14.20	.Q	.	.	.	V.
8.833	84.9975	13.56	.Q	.	.	.	V.
8.917	85.0866	12.94	.Q	.	.	.	V.
9.000	85.1717	12.35	.Q	.	.	.	V.
9.083	85.2530	11.80	.Q	.	.	.	V.
9.167	85.3305	11.26	.Q	.	.	.	V.
9.250	85.4046	10.75	.Q	.	.	.	V.
9.333	85.4752	10.26	.Q	.	.	.	V.
9.417	85.5427	9.80	Q	.	.	.	V.
9.500	85.6072	9.35	Q	.	.	.	V.
9.583	85.6687	8.93	Q	.	.	.	V.
9.667	85.7274	8.53	Q	.	.	.	V.
9.750	85.7834	8.14	Q	.	.	.	V.
9.833	85.8370	7.77	Q	.	.	.	V.
9.917	85.8881	7.42	Q	.	.	.	V.
10.000	85.9368	7.08	Q	.	.	.	V.
10.083	85.9834	6.76	Q	.	.	.	V.
10.167	86.0279	6.46	Q	.	.	.	V.
10.250	86.0703	6.16	Q	.	.	.	V.
10.333	86.1109	5.88	Q	.	.	.	V.
10.417	86.1495	5.62	Q	.	.	.	V.
10.500	86.1865	5.36	Q	.	.	.	V.
10.583	86.2217	5.12	Q	.	.	.	V.
10.667	86.2554	4.89	Q	.	.	.	V.
10.750	86.2876	4.67	Q	.	.	.	V.
10.833	86.3182	4.46	Q	.	.	.	V.
10.917	86.3475	4.25	Q	.	.	.	V.
11.000	86.3755	4.06	Q	.	.	.	V.
11.083	86.4022	3.88	Q	.	.	.	V.
11.167	86.4277	3.70	Q	.	.	.	V.
11.250	86.4520	3.53	Q	.	.	.	V.
11.333	86.4753	3.37	Q	.	.	.	V.
11.417	86.4974	3.22	Q	.	.	.	V.
11.500	86.5186	3.07	Q	.	.	.	V.
11.583	86.5388	2.94	Q	.	.	.	V.
11.667	86.5581	2.80	Q	.	.	.	V.
11.750	86.5766	2.68	Q	.	.	.	V.
11.833	86.5942	2.55	Q	.	.	.	V.
11.917	86.6110	2.44	Q	.	.	.	V.
12.000	86.6270	2.33	Q	.	.	.	V.
12.083	86.6423	2.22	Q	.	.	.	V.
12.167	86.6569	2.12	Q	.	.	.	V.
12.250	86.6709	2.03	Q	.	.	.	V.
12.333	86.6842	1.93	Q	.	.	.	V.
12.417	86.6969	1.85	Q	.	.	.	V.
12.500	86.7090	1.76	Q	.	.	.	V.

12.583	86.7206	1.68	Q	.	.	.	V.
12.667	86.7317	1.61	Q	.	.	.	V.
12.750	86.7423	1.53	Q	.	.	.	V.
12.833	86.7523	1.46	Q	.	.	.	V.
12.917	86.7620	1.40	Q	.	.	.	V.
13.000	86.7712	1.33	Q	.	.	.	V.
13.083	86.7799	1.27	Q	.	.	.	V.
13.167	86.7883	1.22	Q	.	.	.	V.
13.250	86.7963	1.16	Q	.	.	.	V.
13.333	86.8040	1.11	Q	.	.	.	V.
13.417	86.8112	1.06	Q	.	.	.	V.
13.500	86.8182	1.01	Q	.	.	.	V.
13.583	86.8249	0.96	Q	.	.	.	V.
13.667	86.8312	0.92	Q	.	.	.	V.
13.750	86.8373	0.88	Q	.	.	.	V.
13.833	86.8430	0.84	Q	.	.	.	V.
13.917	86.8486	0.80	Q	.	.	.	V.
14.000	86.8538	0.77	Q	.	.	.	V.
14.083	86.8589	0.73	Q	.	.	.	V.
14.167	86.8637	0.70	Q	.	.	.	V.
14.250	86.8683	0.67	Q	.	.	.	V.
14.333	86.8726	0.64	Q	.	.	.	V.
14.417	86.8768	0.61	Q	.	.	.	V.
14.500	86.8808	0.58	Q	.	.	.	V.
14.583	86.8846	0.55	Q	.	.	.	V.
14.667	86.8883	0.53	Q	.	.	.	V.
14.750	86.8917	0.50	Q	.	.	.	V.
14.833	86.8950	0.48	Q	.	.	.	V.
14.917	86.8982	0.46	Q	.	.	.	V.
15.000	86.9012	0.44	Q	.	.	.	V.
15.083	86.9041	0.42	Q	.	.	.	V.
15.167	86.9069	0.40	Q	.	.	.	V.
15.250	86.9095	0.38	Q	.	.	.	V.
15.333	86.9120	0.36	Q	.	.	.	V.
15.417	86.9144	0.35	Q	.	.	.	V.
15.500	86.9167	0.33	Q	.	.	.	V.
15.583	86.9189	0.32	Q	.	.	.	V.
15.667	86.9210	0.30	Q	.	.	.	V.
15.750	86.9230	0.29	Q	.	.	.	V.
15.833	86.9249	0.28	Q	.	.	.	V.
15.917	86.9267	0.26	Q	.	.	.	V.
16.000	86.9284	0.25	Q	.	.	.	V.
16.083	86.9301	0.24	Q	.	.	.	V.
16.167	86.9316	0.23	Q	.	.	.	V.
16.250	86.9331	0.22	Q	.	.	.	V.
16.333	86.9346	0.21	Q	.	.	.	V.
16.417	86.9360	0.20	Q	.	.	.	V.
16.500	86.9373	0.19	Q	.	.	.	V.
16.583	86.9385	0.18	Q	.	.	.	V.
16.667	86.9397	0.17	Q	.	.	.	V.
16.750	86.9409	0.17	Q	.	.	.	V.
16.833	86.9420	0.16	Q	.	.	.	V.
16.917	86.9430	0.15	Q	.	.	.	V.
17.000	86.9440	0.14	Q	.	.	.	V.
17.083	86.9449	0.14	Q	.	.	.	V.
17.167	86.9458	0.13	Q	.	.	.	V.
17.250	86.9467	0.13	Q	.	.	.	V.
17.333	86.9475	0.12	Q	.	.	.	V.
17.417	86.9483	0.11	Q	.	.	.	V.
17.500	86.9491	0.11	Q	.	.	.	V.
17.583	86.9498	0.10	Q	.	.	.	V.
17.667	86.9505	0.10	Q	.	.	.	V.
17.750	86.9511	0.10	Q	.	.	.	V.

```
  17.833     86.9518      0.09  Q         .         .         .        V.
  17.917     86.9523      0.09  Q         .         .         .        V.
  18.000     86.9529      0.08  Q         .         .         .        V.
  18.083     86.9535      0.08  Q         .         .         .        V.
  18.167     86.9540      0.08  Q         .         .         .        V.
  18.250     86.9545      0.07  Q         .         .         .        V.
  18.333     86.9549      0.07  Q         .         .         .        V.
  18.417     86.9554      0.07  Q         .         .         .        V.
  18.500     86.9558      0.06  Q         .         .         .        V.
  18.583     86.9562      0.06  Q         .         .         .        V.
  18.667     86.9566      0.06  Q         .         .         .        V.
  18.750     86.9570      0.05  Q         .         .         .        V.
  18.833     86.9574      0.05  Q         .         .         .        V.
  18.917     86.9577      0.05  Q         .         .         .        V.
  19.000     86.9580      0.05  Q         .         .         .        V.
  19.083     86.9584      0.05  Q         .         .         .        V.
  19.167     86.9587      0.04  Q         .         .         .        V.
  19.250     86.9589      0.04  Q         .         .         .        V.
  19.333     86.9592      0.04  Q         .         .         .        V.
  19.417     86.9595      0.04  Q         .         .         .        V.
  19.500     86.9597      0.04  Q         .         .         .        V.
  19.583     86.9600      0.03  Q         .         .         .        V.
  19.667     86.9602      0.03  Q         .         .         .        V.
  19.750     86.9604      0.03  Q         .         .         .        V.
  19.833     86.9606      0.03  Q         .         .         .        V.
  19.917     86.9608      0.03  Q         .         .         .        V.
  20.000     86.9610      0.03  Q         .         .         .        V.
------------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1205.0
             10%                             365.0
             20%                             255.0
             30%                             190.0
             40%                             150.0
             50%                             125.0
             60%                             105.0
             70%                              85.0
             80%                              65.0
             90%                              45.0


 ****************************************************************************
   FLOW PROCESS FROM NODE   1061.00 TO NODE    106.00 IS CODE = 5.2
 ----------------------------------------------------------------------------
   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
 ============================================================================

          THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
          TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
          INTERVALS(Reference: the National Engineering Handbook,
          Hydrology, Chapter 17, page 17-52, August,1972,
          U.S. Department of Commerce).


          ASSUMED REGULAR CHANNEL INFORMATION:
            BASEWIDTH(FT) =    4.00     CHANNEL Z =  1.50
```

UPSTREAM ELEVATION(FT) = 2464.00
DOWNSTREAM ELEVATION(FT) = 2447.00
CHANNEL LENGTH(FT) = 685.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 374.97
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 299.13
CHANNEL NORMAL VELOCITY FOR Q = 299.13 CFS = 18.95 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.918

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	0.07	0.06	0.06
0.167	0.44	0.40	0.40
0.250	1.47	1.36	1.36
0.333	3.38	3.17	3.17
0.417	6.06	5.76	5.76
0.500	9.32	8.96	8.96
0.583	13.16	12.74	12.74
0.667	17.56	17.08	17.08
0.750	22.39	21.85	21.85
0.833	27.47	26.91	26.91
0.917	32.67	32.09	32.09
1.000	37.83	37.26	37.26
1.083	42.88	42.33	42.33
1.167	48.08	47.51	47.51
1.250	53.78	53.15	53.15
1.333	60.07	59.37	59.37
1.417	66.75	66.01	66.01
1.500	73.67	72.91	72.91
1.583	80.92	80.12	80.12
1.667	88.64	87.79	87.79
1.750	96.81	95.91	95.91
1.833	105.38	104.43	104.43
1.917	114.50	113.49	113.49
2.000	124.18	123.11	123.11
2.083	138.54	136.95	136.95
2.167	161.14	158.64	158.64
2.250	182.44	180.09	180.09
2.333	199.56	197.67	197.67
2.417	219.05	216.90	216.90
2.500	241.59	239.10	239.10
2.583	268.25	265.30	265.30
2.667	298.41	295.07	295.07
2.750	325.44	322.45	322.45
2.833	346.81	344.44	344.44
2.917	363.11	361.30	361.30
3.000	372.16	371.16	371.16
3.083	374.97	374.66	374.66
3.167	373.39	373.56	373.56
3.250	368.46	369.00	369.00
3.333	360.99	361.81	361.81
3.417	351.90	352.90	352.90
3.500	341.89	343.00	343.00

3.583	331.36	332.53	332.53
3.667	320.56	321.76	321.76
3.750	308.72	310.03	310.03
3.833	293.42	295.11	295.11
3.917	275.98	277.91	277.91
4.000	259.20	261.06	261.06
4.083	243.11	244.89	244.89
4.167	227.74	229.44	229.44
4.250	213.09	214.71	214.71
4.333	199.13	200.67	200.67
4.417	185.82	187.29	187.29
4.500	170.54	172.23	172.23
4.583	152.52	154.52	154.52
4.667	137.39	139.07	139.07
4.750	128.80	129.75	129.75
4.833	123.51	124.10	124.10
4.917	118.40	118.97	118.97
5.000	113.46	114.01	114.01
5.083	108.65	109.19	109.19
5.167	103.96	104.48	104.48
5.250	99.37	99.88	99.88
5.333	94.94	95.43	95.43
5.417	90.67	91.14	91.14
5.500	86.58	87.04	87.04
5.583	82.67	83.10	83.10
5.667	78.92	79.34	79.34
5.750	75.35	75.74	75.74
5.833	71.93	72.31	72.31
5.917	68.67	69.04	69.04
6.000	65.56	65.91	65.91
6.083	62.59	62.92	62.92
6.167	59.76	60.07	60.07
6.250	57.05	57.35	57.35
6.333	54.47	54.75	54.75
6.417	52.00	52.27	52.27
6.500	49.64	49.90	49.90
6.583	47.39	47.64	47.64
6.667	45.25	45.48	45.48
6.750	43.20	43.42	43.42
6.833	41.24	41.46	41.46
6.917	39.37	39.58	39.58
7.000	37.59	37.79	37.79
7.083	35.89	36.07	36.07
7.167	34.26	34.44	34.44
7.250	32.71	32.88	32.88
7.333	31.23	31.39	31.39
7.417	29.81	29.97	29.97
7.500	28.46	28.61	28.61
7.583	27.17	27.31	27.31
7.667	25.94	26.08	26.08
7.750	24.77	24.90	24.90
7.833	23.64	23.77	23.77
7.917	22.57	22.69	22.69
8.000	21.55	21.66	21.66
8.083	20.57	20.68	20.68
8.167	19.64	19.74	19.74
8.250	18.75	18.85	18.85
8.333	17.90	18.00	18.00
8.417	17.09	17.18	17.18
8.500	16.32	16.40	16.40
8.583	15.58	15.66	15.66
8.667	14.87	14.95	14.95
8.750	14.20	14.27	14.27

8.833	13.56	13.63	13.63
8.917	12.94	13.01	13.01
9.000	12.35	12.42	12.42
9.083	11.80	11.86	11.86
9.167	11.26	11.32	11.32
9.250	10.75	10.81	10.81
9.333	10.26	10.32	10.32
9.417	9.80	9.85	9.85
9.500	9.35	9.40	9.40
9.583	8.93	8.98	8.98
9.667	8.53	8.57	8.57
9.750	8.14	8.18	8.18
9.833	7.77	7.81	7.81
9.917	7.42	7.46	7.46
10.000	7.08	7.12	7.12
10.083	6.76	6.80	6.80
10.167	6.46	6.49	6.49
10.250	6.16	6.20	6.20
10.333	5.88	5.92	5.92
10.417	5.62	5.65	5.65
10.500	5.36	5.39	5.39
10.583	5.12	5.15	5.15
10.667	4.89	4.91	4.91
10.750	4.67	4.69	4.69
10.833	4.46	4.48	4.48
10.917	4.25	4.28	4.28
11.000	4.06	4.08	4.08
11.083	3.88	3.90	3.90
11.167	3.70	3.72	3.72
11.250	3.53	3.55	3.55
11.333	3.37	3.39	3.39
11.417	3.22	3.24	3.24
11.500	3.07	3.09	3.09
11.583	2.94	2.95	2.95
11.667	2.80	2.82	2.82
11.750	2.68	2.69	2.69
11.833	2.55	2.57	2.57
11.917	2.44	2.45	2.45
12.000	2.33	2.34	2.34
12.083	2.22	2.23	2.23
12.167	2.12	2.13	2.13
12.250	2.03	2.04	2.04
12.333	1.93	1.94	1.94
12.417	1.85	1.86	1.86
12.500	1.76	1.77	1.77
12.583	1.68	1.69	1.69
12.667	1.61	1.62	1.62
12.750	1.53	1.54	1.54
12.833	1.46	1.47	1.47
12.917	1.40	1.41	1.41
13.000	1.33	1.34	1.34
13.083	1.27	1.28	1.28
13.167	1.22	1.22	1.22
13.250	1.16	1.17	1.17
13.333	1.11	1.11	1.11
13.417	1.06	1.06	1.06
13.500	1.01	1.02	1.02
13.583	0.96	0.97	0.97
13.667	0.92	0.93	0.93
13.750	0.88	0.88	0.88
13.833	0.84	0.84	0.84
13.917	0.80	0.81	0.81
14.000	0.77	0.77	0.77

14.083	0.73	0.73	0.73
14.167	0.70	0.70	0.70
14.250	0.67	0.67	0.67
14.333	0.64	0.64	0.64
14.417	0.61	0.61	0.61
14.500	0.58	0.58	0.58
14.583	0.55	0.56	0.56
14.667	0.53	0.53	0.53
14.750	0.50	0.51	0.51
14.833	0.48	0.48	0.48
14.917	0.46	0.46	0.46
15.000	0.44	0.44	0.44
15.083	0.42	0.42	0.42
15.167	0.40	0.40	0.40
15.250	0.38	0.38	0.38
15.333	0.36	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.33	0.33	0.33
15.583	0.32	0.32	0.32
15.667	0.30	0.30	0.30
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.26	0.26	0.26
16.000	0.25	0.25	0.25
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.18	0.18	0.18
16.667	0.17	0.17	0.17
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.14	0.14	0.14
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.11	0.11	0.11
17.500	0.11	0.11	0.11
17.583	0.10	0.10	0.10
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.05	0.05	0.05
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04

```
        19.333         0.04        0.04        0.04
        19.417         0.04        0.04        0.04
        19.500         0.04        0.04        0.04
        19.583         0.03        0.03        0.03
        19.667         0.03        0.03        0.03
        19.750         0.03        0.03        0.03
        19.833         0.03        0.03        0.03
        19.917         0.03        0.03        0.03
        20.000         0.03        0.03        0.03
        20.083         0.03        0.03        0.03
        20.167         0.02        0.02        0.02
        20.250         0.02        0.02        0.02
        20.333         0.02        0.02        0.02
        20.417         0.02        0.02        0.02
        20.500         0.02        0.02        0.02
        20.583         0.02        0.02        0.02
        20.667         0.02        0.02        0.02
        20.750         0.02        0.02        0.02
        20.833         0.02        0.02        0.02
        20.917         0.02        0.02        0.02
        21.000         0.02        0.02        0.02
        21.083         0.01        0.01        0.01
        21.167         0.01        0.01        0.01
        21.250         0.01        0.01        0.01
        21.333         0.01        0.01        0.01
        21.417         0.01        0.01        0.01
        21.500         0.01        0.01        0.01
        21.583         0.01        0.01        0.01
        21.667         0.01        0.01        0.01
        21.750         0.01        0.01        0.01
        21.833         0.01        0.01        0.01
        21.917         0.01        0.01        0.01
        22.000         0.01        0.01        0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     86.965 AF
    OUTFLOW VOLUME =     86.965 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      20.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.085
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
```

UNIT INTERVAL PERCENTAGE OF LAG-TIME = 83.333

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	34.863
2	59.664	113.779
3	78.792	47.654
4	86.766	19.865
5	91.428	11.615
6	94.514	7.689
7	96.650	5.320
8	98.044	3.474
9	98.699	1.630
10	99.289	1.471
11	99.716	1.063
12	99.929	0.531
13	100.000	0.177

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0071	0.0222
2	0.0292	0.0071	0.0222
3	0.0247	0.0071	0.0177
4	0.0337	0.0071	0.0267
5	0.0337	0.0071	0.0267
6	0.0405	0.0071	0.0334
7	0.0337	0.0071	0.0267
8	0.0405	0.0071	0.0334
9	0.0405	0.0071	0.0334
10	0.0337	0.0071	0.0267
11	0.0360	0.0071	0.0289
12	0.0405	0.0071	0.0334
13	0.0495	0.0071	0.0424
14	0.0495	0.0071	0.0424
15	0.0495	0.0071	0.0424
16	0.0450	0.0071	0.0379
17	0.0585	0.0071	0.0514
18	0.0607	0.0071	0.0537
19	0.0540	0.0071	0.0469
20	0.0607	0.0071	0.0537
21	0.0742	0.0071	0.0672
22	0.0697	0.0071	0.0627
23	0.0652	0.0071	0.0582
24	0.0675	0.0071	0.0604
25	0.0697	0.0071	0.0627
26	0.0945	0.0071	0.0874
27	0.1125	0.0071	0.1054
28	0.0787	0.0071	0.0717
29	0.1530	0.0071	0.1459
30	0.1642	0.0071	0.1572
31	0.1845	0.0071	0.1774
32	0.1327	0.0071	0.1257
33	0.0450	0.0071	0.0379
34	0.0405	0.0071	0.0334
35	0.0405	0.0071	0.0334
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.25
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.00

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.4362
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.4242

```
============================================================================

                         3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       10.0      20.0      30.0      40.0
----------------------------------------------------------------------------
   0.083      0.0053      0.77  Q         .         .         .         .
   0.167      0.0280      3.30  V  Q      .         .         .         .
   0.250      0.0569      4.20  V   Q     .         .         .         .
   0.333      0.0875      4.44  .V  Q     .         .         .         .
   0.417      0.1254      5.51  .V   Q    .         .         .         .
   0.500      0.1685      6.25  .V    Q   .         .         .         .
   0.583      0.2169      7.03  . V    Q  .         .         .         .
   0.667      0.2649      6.97  .  V  Q   .         .         .         .
   0.750      0.3174      7.63  .  V   Q  .         .         .         .
   0.833      0.3706      7.72  .   V  Q  .         .         .         .
   0.917      0.4201      7.19  .   V  Q  .         .         .         .
   1.000      0.4708      7.36  .    V Q  .         .         .         .
   1.083      0.5274      8.21  .     V Q .         .         .         .
   1.167      0.5924      9.45  .     V  Q.         .         .         .
   1.250      0.6611      9.97  .      V Q.         .         .         .
   1.333      0.7301     10.03  .       V Q         .         .         .
   1.417      0.7999     10.12  .        VQ         .         .         .
   1.500      0.8799     11.62  .         VQ        .         .         .
   1.583      0.9643     12.25  .         .VQ       .         .         .
   1.667      1.0475     12.08  .         . Q       .         .         .
   1.750      1.1383     13.18  .         .  Q      .         .         .
   1.833      1.2407     14.87  .         .   Q     .         .         .
   1.917      1.3439     14.99  .         .   QV    .         .         .
   2.000      1.4451     14.69  .         .   Q V   .         .         .
   2.083      1.5479     14.92  .         .   Q   V .         .         .
   2.167      1.6591     16.14  .         .     Q  V.         .         .
   2.250      1.7951     19.75  .         .        QV         .         .
   2.333      1.9457     21.87  .         .         .QV       .         .
   2.417      2.0972     22.00  .         .         .Q  V     .         .
   2.500      2.3032     29.91  .         .         .     V  Q.         .
   2.583      2.5455     35.18  .         .         .        V.    Q    .
   2.667      2.8043     37.58  .         .         .         . V    Q  .
   2.750      3.0151     30.61  .         .         .         Q    V    .
   2.833      3.1461     19.03  .         .        Q.         .     V   .
   2.917      3.2424     13.98  .         .  Q      .         .      V  .
   3.000      3.3179     10.96  .         Q         .         .       V .
   3.083      3.3622      6.43  .     Q   .         .         .        V.
   3.167      3.3868      3.57  .  Q      .         .         .        V.
   3.250      3.4016      2.15  . Q       .         .         .        V.
   3.333      3.4110      1.37  .Q        .         .         .        V.
   3.417      3.4171      0.89  Q         .         .         .        V.
   3.500      3.4207      0.52  Q         .         .         .        V.
   3.583      3.4225      0.27  Q         .         .         .        V.
   3.667      3.4235      0.14  Q         .         .         .        V.
   3.750      3.4240      0.07  Q         .         .         .        V.
   3.833      3.4242      0.03  Q         .         .         .        V.
   3.917      3.4242      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	175.0
20%	130.0
30%	90.0
40%	45.0
50%	40.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      100.0     200.0     300.0     400.0
----------------------------------------------------------------------------
   0.083      0.0057      0.83  Q         .         .         .         .
   0.167      0.0312      3.70  Q         .         .         .         .
   0.250      0.0695      5.55  Q         .         .         .         .
   0.333      0.1218      7.61  Q         .         .         .         .
   0.417      0.1994     11.27  VQ        .         .         .         .
   0.500      0.3042     15.21  VQ        .         .         .         .
   0.583      0.4403     19.77  VQ        .         .         .         .
   0.667      0.6059     24.04  V Q       .         .         .         .
   0.750      0.8089     29.48  V Q       .         .         .         .
   0.833      1.0474     34.63  V  Q      .         .         .         .
   0.917      1.3179     39.28  V  Q      .         .         .         .
   1.000      1.6252     44.62  V   Q     .         .         .         .
   1.083      1.9733     50.54  V    Q    .         .         .         .
   1.167      2.3655     56.95  .V   Q    .         .         .         .
   1.250      2.8002     63.11  .V    Q   .         .         .         .
   1.333      3.2782     69.40  .V    Q   .         .         .         .
   1.417      3.8025     76.14  .V     Q  .         .         .         .
   1.500      4.3847     84.53  .V      Q .         .         .         .
   1.583      5.0208     92.37  . V      Q.         .         .         .
   1.667      5.7086     99.87  . V      Q.         .         .         .
   1.750      6.4599    109.09  . V       Q         .         .         .
   1.833      7.2816    119.30  .  V      .Q        .         .         .
   1.917      8.1664    128.48  .  V      . Q       .         .         .
   2.000      9.1155    137.81  .   V     .  Q      .         .         .
   2.083     10.1614    151.87  .   V     .    Q    .         .         .
   2.167     11.3652    174.78  .    V    .      Q  .         .         .
   2.250     12.7415    199.84  .    V    .        Q.         .         .
   2.333     14.2534    219.54  .     V   .         .Q        .         .
   2.417     15.8987    238.90  .      V  .         .  Q      .         .
   2.500     17.7514    269.00  .      V  .         .     Q   .         .
   2.583     19.8208    300.49  .       V .         .         Q         .
   2.667     22.1118    332.65  .        V.         .         .  Q      .
   2.750     24.5434    353.06  .         V         .         .    Q    .
   2.833     27.0466    363.47  .         .V        .         .     Q   .
   2.917     29.6312    375.28  .         .  V      .         .      Q  .
   3.000     32.2629    382.12  .         .   V     .         .       Q .
```

```
3.083     34.8875    381.09  .         .    V    .         .       Q .
3.167     37.4848    377.13  .         .     V   .         .      Q  .
3.250     40.0410    371.15  .         .      V  .         .      Q  .
3.333     42.5422    363.18  .         .       V .         .     Q   .
3.417     44.9788    353.79  .         .        V.         .    Q    .
3.500     47.3446    343.51  .         .         V         .   Q     .
3.583     49.6366    332.79  .         .         .V        .  Q      .
3.667     51.8535    321.90  .         .         . V       . Q       .
3.750     53.9892    310.10  .         .         .  V      .Q        .
3.833     56.0218    295.14  .         .         .   V    Q.         .
3.917     57.9359    277.91  .         .         .    V Q  .         .
4.000     59.7338    261.06  .         .         .     Q   .         .
4.083     61.4204    244.89  .         .         .   Q  V  .         .
4.167     63.0005    229.44  .         .         . Q    V  .         .
4.250     64.4792    214.71  .         .         .Q      V .         .
4.333     65.8612    200.67  .         .         Q        V.         .
4.417     67.1511    187.29  .         .       Q .        V.         .
4.500     68.3372    172.23  .         .      Q  .         V         .
4.583     69.4014    154.52  .         .    Q    .         V         .
4.667     70.3592    139.07  .         .  Q      .         .V        .
4.750     71.2528    129.75  .         . Q       .         .V        .
4.833     72.1074    124.10  .         . Q       .         .V        .
4.917     72.9268    118.97  .         .Q        .         . V       .
5.000     73.7119    114.01  .         .Q        .         . V       .
5.083     74.4639    109.19  .         Q         .         . V       .
5.167     75.1835    104.48  .         Q         .         .  V      .
5.250     75.8713     99.88  .        Q.         .         .  V      .
5.333     76.5286     95.43  .        Q.         .         .  V      .
5.417     77.1563     91.14  .        Q.         .         .   V     .
5.500     77.7557     87.04  .       Q .         .         .   V     .
5.583     78.3280     83.10  .       Q .         .         .   V     .
5.667     78.8744     79.34  .      Q  .         .         .   V     .
5.750     79.3960     75.74  .      Q  .         .         .    V    .
5.833     79.8941     72.31  .      Q  .         .         .    V    .
5.917     80.3695     69.04  .     Q   .         .         .    V    .
6.000     80.8234     65.91  .     Q   .         .         .    V    .
6.083     81.2568     62.92  .     Q   .         .         .    V    .
6.167     81.6705     60.07  .     Q   .         .         .     V   .
6.250     82.0654     57.35  .    Q    .         .         .     V   .
6.333     82.4425     54.75  .    Q    .         .         .     V   .
6.417     82.8025     52.27  .    Q    .         .         .     V   .
6.500     83.1462     49.90  .   Q     .         .         .     V   .
6.583     83.4743     47.64  .   Q     .         .         .     V   .
6.667     83.7876     45.48  .   Q     .         .         .      V  .
6.750     84.0867     43.42  .   Q     .         .         .      V  .
6.833     84.3722     41.46  .   Q     .         .         .      V  .
6.917     84.6448     39.58  .  Q      .         .         .      V  .
7.000     84.9050     37.79  .  Q      .         .         .      V  .
7.083     85.1534     36.07  .  Q      .         .         .      V  .
7.167     85.3906     34.44  .  Q      .         .         .      V  .
7.250     85.6171     32.88  .  Q      .         .         .      V  .
7.333     85.8332     31.39  .  Q      .         .         .      V  .
7.417     86.0396     29.97  . Q       .         .         .       V .
7.500     86.2367     28.61  . Q       .         .         .       V .
7.583     86.4248     27.31  . Q       .         .         .       V .
7.667     86.6044     26.08  . Q       .         .         .       V .
7.750     86.7758     24.90  . Q       .         .         .       V .
7.833     86.9395     23.77  . Q       .         .         .       V .
7.917     87.0958     22.69  . Q       .         .         .       V .
8.000     87.2450     21.66  . Q       .         .         .       V .
8.083     87.3874     20.68  . Q       .         .         .       V .
8.167     87.5234     19.74  .Q        .         .         .       V .
8.250     87.6532     18.85  .Q        .         .         .       V .
```

8.333	87.7772	18.00	.Q	.	.	.	V .
8.417	87.8955	17.18	.Q	.	.	.	V .
8.500	88.0085	16.40	.Q	.	.	.	V .
8.583	88.1163	15.66	.Q	.	.	.	V .
8.667	88.2193	14.95	.Q	.	.	.	V.
8.750	88.3176	14.27	.Q	.	.	.	V.
8.833	88.4114	13.63	.Q	.	.	.	V.
8.917	88.5010	13.01	.Q	.	.	.	V.
9.000	88.5866	12.42	.Q	.	.	.	V.
9.083	88.6682	11.86	.Q	.	.	.	V.
9.167	88.7462	11.32	.Q	.	.	.	V.
9.250	88.8206	10.81	.Q	.	.	.	V.
9.333	88.8917	10.32	.Q	.	.	.	V.
9.417	88.9595	9.85	Q	.	.	.	V.
9.500	89.0243	9.40	Q	.	.	.	V.
9.583	89.0861	8.98	Q	.	.	.	V.
9.667	89.1451	8.57	Q	.	.	.	V.
9.750	89.2015	8.18	Q	.	.	.	V.
9.833	89.2553	7.81	Q	.	.	.	V.
9.917	89.3067	7.46	Q	.	.	.	V.
10.000	89.3557	7.12	Q	.	.	.	V.
10.083	89.4025	6.80	Q	.	.	.	V.
10.167	89.4472	6.49	Q	.	.	.	V.
10.250	89.4899	6.20	Q	.	.	.	V.
10.333	89.5306	5.92	Q	.	.	.	V.
10.417	89.5695	5.65	Q	.	.	.	V.
10.500	89.6067	5.39	Q	.	.	.	V.
10.583	89.6421	5.15	Q	.	.	.	V.
10.667	89.6759	4.91	Q	.	.	.	V.
10.750	89.7083	4.69	Q	.	.	.	V.
10.833	89.7391	4.48	Q	.	.	.	V.
10.917	89.7686	4.28	Q	.	.	.	V.
11.000	89.7967	4.08	Q	.	.	.	V.
11.083	89.8235	3.90	Q	.	.	.	V.
11.167	89.8491	3.72	Q	.	.	.	V.
11.250	89.8736	3.55	Q	.	.	.	V.
11.333	89.8970	3.39	Q	.	.	.	V.
11.417	89.9193	3.24	Q	.	.	.	V.
11.500	89.9405	3.09	Q	.	.	.	V.
11.583	89.9609	2.95	Q	.	.	.	V.
11.667	89.9803	2.82	Q	.	.	.	V.
11.750	89.9988	2.69	Q	.	.	.	V.
11.833	90.0165	2.57	Q	.	.	.	V.
11.917	90.0334	2.45	Q	.	.	.	V.
12.000	90.0495	2.34	Q	.	.	.	V.
12.083	90.0649	2.23	Q	.	.	.	V.
12.167	90.0796	2.13	Q	.	.	.	V.
12.250	90.0936	2.04	Q	.	.	.	V.
12.333	90.1070	1.94	Q	.	.	.	V.
12.417	90.1198	1.86	Q	.	.	.	V.
12.500	90.1320	1.77	Q	.	.	.	V.
12.583	90.1436	1.69	Q	.	.	.	V.
12.667	90.1547	1.62	Q	.	.	.	V.
12.750	90.1654	1.54	Q	.	.	.	V.
12.833	90.1755	1.47	Q	.	.	.	V.
12.917	90.1852	1.41	Q	.	.	.	V.
13.000	90.1944	1.34	Q	.	.	.	V.
13.083	90.2032	1.28	Q	.	.	.	V.
13.167	90.2117	1.22	Q	.	.	.	V.
13.250	90.2197	1.17	Q	.	.	.	V.
13.333	90.2274	1.11	Q	.	.	.	V.
13.417	90.2347	1.06	Q	.	.	.	V.
13.500	90.2417	1.02	Q	.	.	.	V.

13.583	90.2484	0.97	Q	.	.	.	V.
13.667	90.2548	0.93	Q	.	.	.	V.
13.750	90.2609	0.88	Q	.	.	.	V.
13.833	90.2667	0.84	Q	.	.	.	V.
13.917	90.2722	0.81	Q	.	.	.	V.
14.000	90.2775	0.77	Q	.	.	.	V.
14.083	90.2826	0.73	Q	.	.	.	V.
14.167	90.2874	0.70	Q	.	.	.	V.
14.250	90.2920	0.67	Q	.	.	.	V.
14.333	90.2964	0.64	Q	.	.	.	V.
14.417	90.3006	0.61	Q	.	.	.	V.
14.500	90.3046	0.58	Q	.	.	.	V.
14.583	90.3085	0.56	Q	.	.	.	V.
14.667	90.3121	0.53	Q	.	.	.	V.
14.750	90.3156	0.51	Q	.	.	.	V.
14.833	90.3189	0.48	Q	.	.	.	V.
14.917	90.3221	0.46	Q	.	.	.	V.
15.000	90.3252	0.44	Q	.	.	.	V.
15.083	90.3281	0.42	Q	.	.	.	V.
15.167	90.3308	0.40	Q	.	.	.	V.
15.250	90.3335	0.38	Q	.	.	.	V.
15.333	90.3360	0.37	Q	.	.	.	V.
15.417	90.3384	0.35	Q	.	.	.	V.
15.500	90.3407	0.33	Q	.	.	.	V.
15.583	90.3429	0.32	Q	.	.	.	V.
15.667	90.3450	0.30	Q	.	.	.	V.
15.750	90.3470	0.29	Q	.	.	.	V.
15.833	90.3489	0.28	Q	.	.	.	V.
15.917	90.3507	0.26	Q	.	.	.	V.
16.000	90.3525	0.25	Q	.	.	.	V.
16.083	90.3541	0.24	Q	.	.	.	V.
16.167	90.3557	0.23	Q	.	.	.	V.
16.250	90.3572	0.22	Q	.	.	.	V.
16.333	90.3587	0.21	Q	.	.	.	V.
16.417	90.3601	0.20	Q	.	.	.	V.
16.500	90.3614	0.19	Q	.	.	.	V.
16.583	90.3626	0.18	Q	.	.	.	V.
16.667	90.3639	0.17	Q	.	.	.	V.
16.750	90.3650	0.17	Q	.	.	.	V.
16.833	90.3661	0.16	Q	.	.	.	V.
16.917	90.3671	0.15	Q	.	.	.	V.
17.000	90.3681	0.14	Q	.	.	.	V.
17.083	90.3691	0.14	Q	.	.	.	V.
17.167	90.3700	0.13	Q	.	.	.	V.
17.250	90.3709	0.13	Q	.	.	.	V.
17.333	90.3717	0.12	Q	.	.	.	V.
17.417	90.3725	0.11	Q	.	.	.	V.
17.500	90.3733	0.11	Q	.	.	.	V.
17.583	90.3740	0.10	Q	.	.	.	V.
17.667	90.3747	0.10	Q	.	.	.	V.
17.750	90.3753	0.10	Q	.	.	.	V.
17.833	90.3759	0.09	Q	.	.	.	V.
17.917	90.3765	0.09	Q	.	.	.	V.
18.000	90.3771	0.08	Q	.	.	.	V.
18.083	90.3777	0.08	Q	.	.	.	V.
18.167	90.3782	0.08	Q	.	.	.	V.
18.250	90.3787	0.07	Q	.	.	.	V.
18.333	90.3792	0.07	Q	.	.	.	V.
18.417	90.3796	0.07	Q	.	.	.	V.
18.500	90.3801	0.06	Q	.	.	.	V.
18.583	90.3805	0.06	Q	.	.	.	V.
18.667	90.3809	0.06	Q	.	.	.	V.
18.750	90.3812	0.05	Q	.	.	.	V.

```
  18.833     90.3816      0.05  Q         .         .         .        V.
  18.917     90.3819      0.05  Q         .         .         .        V.
  19.000     90.3823      0.05  Q         .         .         .        V.
  19.083     90.3826      0.05  Q         .         .         .        V.
  19.167     90.3829      0.04  Q         .         .         .        V.
  19.250     90.3832      0.04  Q         .         .         .        V.
  19.333     90.3834      0.04  Q         .         .         .        V.
  19.417     90.3837      0.04  Q         .         .         .        V.
  19.500     90.3839      0.04  Q         .         .         .        V.
  19.583     90.3842      0.03  Q         .         .         .        V.
  19.667     90.3844      0.03  Q         .         .         .        V.
  19.750     90.3846      0.03  Q         .         .         .        V.
  19.833     90.3848      0.03  Q         .         .         .        V.
  19.917     90.3850      0.03  Q         .         .         .        V.
  20.000     90.3852      0.03  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                 Duration
        Peak Flow Rate                      (minutes)
    =======================                 =========
              0%                             1205.0
             10%                              365.0
             20%                              255.0
             30%                              190.0
             40%                              150.0
             50%                              130.0
             60%                              110.0
             70%                               90.0
             80%                               70.0
             90%                               45.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
 ----------------------------------------------------------------------------
   >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
 ============================================================================

       (UNIT-HYDROGRAPH ADDED TO STREAM #1)

          WATERSHED AREA =      17.800 ACRES
          BASEFLOW =   0.000 CFS/SQUARE-MILE
          *USER ENTERED "LAG" TIME =    0.100 HOURS
           CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
           THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
           MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
          VALLEY S-GRAPH SELECTED
          UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.165
          LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
          USER-ENTERED RAINFALL =  2.25 INCHES
          RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
          RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


          UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
          UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	30.124
2	59.664	98.314
3	78.792	41.177
4	86.766	17.165
5	91.428	10.036
6	94.514	6.644
7	96.650	4.597
8	98.044	3.002
9	98.699	1.408
10	99.289	1.271
11	99.716	0.918
12	99.929	0.459
13	100.000	0.153

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0138	0.0155
2	0.0292	0.0138	0.0155
3	0.0247	0.0124	0.0124
4	0.0337	0.0138	0.0200
5	0.0337	0.0138	0.0200
6	0.0405	0.0138	0.0267
7	0.0337	0.0138	0.0200
8	0.0405	0.0138	0.0267
9	0.0405	0.0138	0.0267
10	0.0337	0.0138	0.0200
11	0.0360	0.0138	0.0222
12	0.0405	0.0138	0.0267
13	0.0495	0.0138	0.0357
14	0.0495	0.0138	0.0357
15	0.0495	0.0138	0.0357
16	0.0450	0.0138	0.0312
17	0.0585	0.0138	0.0447
18	0.0607	0.0138	0.0470
19	0.0540	0.0138	0.0402
20	0.0607	0.0138	0.0470
21	0.0742	0.0138	0.0605
22	0.0697	0.0138	0.0560
23	0.0652	0.0138	0.0515
24	0.0675	0.0138	0.0537
25	0.0697	0.0138	0.0560
26	0.0945	0.0138	0.0807
27	0.1125	0.0138	0.0987
28	0.0787	0.0138	0.0650
29	0.1530	0.0138	0.1392
30	0.1642	0.0138	0.1505
31	0.1845	0.0138	0.1707
32	0.1327	0.0138	0.1190
33	0.0450	0.0138	0.0312
34	0.0405	0.0138	0.0267
35	0.0405	0.0138	0.0267
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.49
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.76

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.7218
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.6141

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============================================================================

                            3 - H O U R   S T O R M
                        R U N O F F   H Y D R O G R A P H

============================================================================
                 HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
          (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       10.0      20.0      30.0      40.0
----------------------------------------------------------------------------
   0.083      0.0032       0.47 Q         .         .         .         .
   0.167      0.0169       1.99 VQ        .         .         .         .
   0.250      0.0344       2.53 V Q       .         .         .         .
   0.333      0.0531       2.72 V Q       .         .         .         .
   0.417      0.0772       3.50 .V Q      .         .         .         .
   0.500      0.1052       4.07 .V  Q     .         .         .         .
   0.583      0.1376       4.70 . V Q     .         .         .         .
   0.667      0.1694       4.62 . V Q     .         .         .         .
   0.750      0.2050       5.18 .  V Q    .         .         .         .
   0.833      0.2412       5.25 .  V Q    .         .         .         .
   0.917      0.2741       4.78 .   Q     .         .         .         .
   1.000      0.3080       4.93 .   Q     .         .         .         .
   1.083      0.3470       5.66 .    Q    .         .         .         .
   1.167      0.3933       6.73 .     Q   .         .         .         .
   1.250      0.4427       7.17 .     VQ  .         .         .         .
   1.333      0.4925       7.23 .      Q  .         .         .         .
   1.417      0.5428       7.31 .      QV .         .         .         .
   1.500      0.6021       8.60 .       QV.         .         .         .
   1.583      0.6651       9.15 .        QV         .         .         .
   1.667      0.7271       9.00 .       Q .V        .         .         .
   1.750      0.7956       9.95 .        Q. V       .         .         .
   1.833      0.8742      11.41 .         .Q V      .         .         .
   1.917      0.9535      11.51 .         .Q  V     .         .         .
   2.000      1.0310      11.26 .         .Q   V    .         .         .
   2.083      1.1099      11.46 .         .Q    V   .         .         .
   2.167      1.1961      12.51 .         . Q     V .         .         .
   2.250      1.3037      15.63 .         .    Q   V.         .         .
   2.333      1.4239      17.46 .         .      Q  .V        .         .
   2.417      1.5449      17.57 .         .      Q  .  V      .         .
   2.500      1.7130      24.40 .         .         .   Q V   .         .
   2.583      1.9125      28.96 .         .         .       QV.         .
   2.667      2.1262      31.03 .         .         .         .QV       .
   2.750      2.2984      25.01 .         .         .    Q    .    V    .
   2.833      2.4018      15.01 .         .    Q    .         .     V   .
   2.917      2.4750      10.64 .         Q         .         .      V  .
   3.000      2.5317       8.23 .       Q .         .         .       V .
   3.083      2.5660       4.98 .   Q     .         .         .        V.
   3.167      2.5852       2.78 . Q       .         .         .        V.
   3.250      2.5967       1.67 .Q        .         .         .        V.
   3.333      2.6039       1.06 .Q        .         .         .        V.
   3.417      2.6087       0.69 Q         .         .         .        V.
   3.500      2.6115       0.40 Q         .         .         .        V.
   3.583      2.6128       0.20 Q         .         .         .        V.
   3.667      2.6135       0.10 Q         .         .         .        V.
   3.750      2.6139       0.05 Q         .         .         .        V.
   3.833      2.6140       0.02 Q         .         .         .        V.
   3.917      2.6141       0.01 Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	165.0
20%	115.0
30%	75.0
40%	45.0
50%	35.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

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****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      100.0     200.0     300.0     400.0
----------------------------------------------------------------------------
   0.083      0.0090      1.30  Q         .         .         .         .
   0.167      0.0481      5.69  Q         .         .         .         .
   0.250      0.1038      8.09  Q         .         .         .         .
   0.333      0.1750     10.33  VQ        .         .         .         .
   0.417      0.2767     14.77  VQ        .         .         .         .
   0.500      0.4094     19.28  VQ        .         .         .         .
   0.583      0.5779     24.46  V Q       .         .         .         .
   0.667      0.7753     28.66  V Q       .         .         .         .
   0.750      1.0140     34.66  V  Q      .         .         .         .
   0.833      1.2886     39.88  V  Q      .         .         .         .
   0.917      1.5920     44.06  V   Q     .         .         .         .
   1.000      1.9333     49.54  V   Q     .         .         .         .
   1.083      2.3203     56.20  V    Q    .         .         .         .
   1.167      2.7588     63.68  .V    Q   .         .         .         .
   1.250      3.2429     70.29  .V     Q  .         .         .         .
   1.333      3.7707     76.63  .V     Q  .         .         .         .
   1.417      4.3454     83.44  .V      Q .         .         .         .
   1.500      4.9867     93.13  . V      Q.         .         .         .
   1.583      5.6859    101.52  . V       Q         .         .         .
   1.667      6.4357    108.87  . V       Q         .         .         .
   1.750      7.2555    119.04  .  V      .Q        .         .         .
   1.833      8.1558    130.72  .  V      .  Q      .         .         .
   1.917      9.1199    139.99  .  V      .  Q      .         .         .
   2.000     10.1465    149.06  .   V     .   Q     .         .         .
   2.083     11.2714    163.33  .   V     .     Q   .         .         .
   2.167     12.5613    187.29  .    V    .       Q .         .         .
   2.250     14.0452    215.46  .     V   .         .Q        .         .
   2.333     15.6774    237.00  .     V   .         .  Q      .         .
   2.417     17.4437    256.47  .      V  .         .    Q    .         .
   2.500     19.4644    293.41  .       V .         .        Q.         .
   2.583     21.7333    329.45  .        V.         .         . Q       .
   2.667     24.2380    363.68  .         V         .         .     Q   .
   2.750     26.8418    378.07  .         .V        .         .      Q  .
   2.833     29.4484    378.48  .         . V       .         .      Q  .
   2.917     32.1062    385.92  .         .  V      .         .       Q .
   3.000     34.7946    390.36  .         .   V     .         .        Q.
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```
     3.083     37.4535    386.07  .         .     V   .         .       Q .
     3.167     40.0700    379.91  .         .      V  .         .      Q  .
     3.250     42.6376    372.82  .         .       V .         .      Q  .
     3.333     45.1462    364.24  .         .        V.         .     Q   .
     3.417     47.5875    354.48  .         .         V         .    Q    .
     3.500     49.9561    343.91  .         .         .V        .   Q     .
     3.583     52.2495    333.00  .         .         . V       .  Q      .
     3.667     54.4671    322.00  .         .         .  V      . Q       .
     3.750     56.6030    310.15  .         .         .   V     .Q        .
     3.833     58.6359    295.17  .         .         .    V   Q.         .
     3.917     60.5499    277.92  .         .         .     VQ  .         .
     4.000     62.3479    261.06  .         .         .     Q   .         .
     4.083     64.0345    244.89  .         .         .   Q  V  .         .
     4.167     65.6146    229.44  .         .         . Q     V .         .
     4.250     67.0933    214.71  .         .         .Q      V .         .
     4.333     68.4753    200.67  .         .         Q        V.         .
     4.417     69.7652    187.29  .         .       Q .         V         .
     4.500     70.9513    172.23  .         .      Q  .         V         .
     4.583     72.0155    154.52  .         .    Q    .         V         .
     4.667     72.9732    139.07  .         .  Q      .         .V        .
     4.750     73.8668    129.75  .         . Q       .         .V        .
     4.833     74.7215    124.10  .         . Q       .         . V       .
     4.917     75.5408    118.97  .         .Q        .         . V       .
     5.000     76.3260    114.01  .         .Q        .         . V       .
     5.083     77.0780    109.19  .         Q         .         .  V      .
     5.167     77.7975    104.48  .         Q         .         .  V      .
     5.250     78.4854     99.88  .        Q.         .         .  V      .
     5.333     79.1427     95.43  .        Q.         .         .   V     .
     5.417     79.7704     91.14  .        Q.         .         .   V     .
     5.500     80.3698     87.04  .       Q .         .         .   V     .
     5.583     80.9421     83.10  .       Q .         .         .   V     .
     5.667     81.4885     79.34  .      Q  .         .         .    V    .
     5.750     82.0101     75.74  .      Q  .         .         .    V    .
     5.833     82.5081     72.31  .      Q  .         .         .    V    .
     5.917     82.9836     69.04  .     Q   .         .         .    V    .
     6.000     83.4375     65.91  .     Q   .         .         .    V    .
     6.083     83.8708     62.92  .     Q   .         .         .     V   .
     6.167     84.2846     60.07  .     Q   .         .         .     V   .
     6.250     84.6795     57.35  .    Q    .         .         .     V   .
     6.333     85.0566     54.75  .    Q    .         .         .     V   .
     6.417     85.4166     52.27  .    Q    .         .         .     V   .
     6.500     85.7603     49.90  .   Q     .         .         .     V   .
     6.583     86.0884     47.64  .   Q     .         .         .      V  .
     6.667     86.4017     45.48  .   Q     .         .         .      V  .
     6.750     86.7007     43.42  .   Q     .         .         .      V  .
     6.833     86.9863     41.46  .   Q     .         .         .      V  .
     6.917     87.2588     39.58  .  Q      .         .         .      V  .
     7.000     87.5191     37.79  .  Q      .         .         .      V  .
     7.083     87.7675     36.07  .  Q      .         .         .      V  .
     7.167     88.0047     34.44  .  Q      .         .         .      V  .
     7.250     88.2311     32.88  .  Q      .         .         .      V  .
     7.333     88.4473     31.39  .  Q      .         .         .       V .
     7.417     88.6537     29.97  . Q       .         .         .       V .
     7.500     88.8508     28.61  . Q       .         .         .       V .
     7.583     89.0389     27.31  . Q       .         .         .       V .
     7.667     89.2185     26.08  . Q       .         .         .       V .
     7.750     89.3899     24.90  . Q       .         .         .       V .
     7.833     89.5536     23.77  . Q       .         .         .       V .
     7.917     89.7099     22.69  . Q       .         .         .       V .
     8.000     89.8591     21.66  . Q       .         .         .       V .
     8.083     90.0015     20.68  . Q       .         .         .       V .
     8.167     90.1375     19.74  .Q        .         .         .       V .
     8.250     90.2673     18.85  .Q        .         .         .       V .
```

8.333	90.3913	18.00	.Q	.	.	.	V .
8.417	90.5096	17.18	.Q	.	.	.	V .
8.500	90.6226	16.40	.Q	.	.	.	V .
8.583	90.7304	15.66	.Q	.	.	.	V.
8.667	90.8334	14.95	.Q	.	.	.	V.
8.750	90.9317	14.27	.Q	.	.	.	V.
8.833	91.0255	13.63	.Q	.	.	.	V.
8.917	91.1151	13.01	.Q	.	.	.	V.
9.000	91.2007	12.42	.Q	.	.	.	V.
9.083	91.2823	11.86	.Q	.	.	.	V.
9.167	91.3603	11.32	.Q	.	.	.	V.
9.250	91.4347	10.81	.Q	.	.	.	V.
9.333	91.5058	10.32	.Q	.	.	.	V.
9.417	91.5736	9.85	Q	.	.	.	V.
9.500	91.6384	9.40	Q	.	.	.	V.
9.583	91.7002	8.98	Q	.	.	.	V.
9.667	91.7592	8.57	Q	.	.	.	V.
9.750	91.8156	8.18	Q	.	.	.	V.
9.833	91.8694	7.81	Q	.	.	.	V.
9.917	91.9208	7.46	Q	.	.	.	V.
10.000	91.9698	7.12	Q	.	.	.	V.
10.083	92.0166	6.80	Q	.	.	.	V.
10.167	92.0613	6.49	Q	.	.	.	V.
10.250	92.1040	6.20	Q	.	.	.	V.
10.333	92.1447	5.92	Q	.	.	.	V.
10.417	92.1836	5.65	Q	.	.	.	V.
10.500	92.2207	5.39	Q	.	.	.	V.
10.583	92.2562	5.15	Q	.	.	.	V.
10.667	92.2900	4.91	Q	.	.	.	V.
10.750	92.3223	4.69	Q	.	.	.	V.
10.833	92.3532	4.48	Q	.	.	.	V.
10.917	92.3826	4.28	Q	.	.	.	V.
11.000	92.4108	4.08	Q	.	.	.	V.
11.083	92.4376	3.90	Q	.	.	.	V.
11.167	92.4632	3.72	Q	.	.	.	V.
11.250	92.4877	3.55	Q	.	.	.	V.
11.333	92.5110	3.39	Q	.	.	.	V.
11.417	92.5333	3.24	Q	.	.	.	V.
11.500	92.5546	3.09	Q	.	.	.	V.
11.583	92.5750	2.95	Q	.	.	.	V.
11.667	92.5944	2.82	Q	.	.	.	V.
11.750	92.6129	2.69	Q	.	.	.	V.
11.833	92.6306	2.57	Q	.	.	.	V.
11.917	92.6475	2.45	Q	.	.	.	V.
12.000	92.6636	2.34	Q	.	.	.	V.
12.083	92.6790	2.23	Q	.	.	.	V.
12.167	92.6937	2.13	Q	.	.	.	V.
12.250	92.7077	2.04	Q	.	.	.	V.
12.333	92.7211	1.94	Q	.	.	.	V.
12.417	92.7339	1.86	Q	.	.	.	V.
12.500	92.7461	1.77	Q	.	.	.	V.
12.583	92.7577	1.69	Q	.	.	.	V.
12.667	92.7688	1.62	Q	.	.	.	V.
12.750	92.7795	1.54	Q	.	.	.	V.
12.833	92.7896	1.47	Q	.	.	.	V.
12.917	92.7993	1.41	Q	.	.	.	V.
13.000	92.8085	1.34	Q	.	.	.	V.
13.083	92.8173	1.28	Q	.	.	.	V.
13.167	92.8258	1.22	Q	.	.	.	V.
13.250	92.8338	1.17	Q	.	.	.	V.
13.333	92.8415	1.11	Q	.	.	.	V.
13.417	92.8488	1.06	Q	.	.	.	V.
13.500	92.8558	1.02	Q	.	.	.	V.

13.583	92.8625	0.97	Q	.	.	.	V.
13.667	92.8689	0.93	Q	.	.	.	V.
13.750	92.8750	0.88	Q	.	.	.	V.
13.833	92.8808	0.84	Q	.	.	.	V.
13.917	92.8863	0.81	Q	.	.	.	V.
14.000	92.8916	0.77	Q	.	.	.	V.
14.083	92.8967	0.73	Q	.	.	.	V.
14.167	92.9015	0.70	Q	.	.	.	V.
14.250	92.9061	0.67	Q	.	.	.	V.
14.333	92.9105	0.64	Q	.	.	.	V.
14.417	92.9147	0.61	Q	.	.	.	V.
14.500	92.9187	0.58	Q	.	.	.	V.
14.583	92.9226	0.56	Q	.	.	.	V.
14.667	92.9262	0.53	Q	.	.	.	V.
14.750	92.9297	0.51	Q	.	.	.	V.
14.833	92.9330	0.48	Q	.	.	.	V.
14.917	92.9362	0.46	Q	.	.	.	V.
15.000	92.9393	0.44	Q	.	.	.	V.
15.083	92.9422	0.42	Q	.	.	.	V.
15.167	92.9449	0.40	Q	.	.	.	V.
15.250	92.9476	0.38	Q	.	.	.	V.
15.333	92.9501	0.37	Q	.	.	.	V.
15.417	92.9525	0.35	Q	.	.	.	V.
15.500	92.9548	0.33	Q	.	.	.	V.
15.583	92.9570	0.32	Q	.	.	.	V.
15.667	92.9591	0.30	Q	.	.	.	V.
15.750	92.9611	0.29	Q	.	.	.	V.
15.833	92.9630	0.28	Q	.	.	.	V.
15.917	92.9648	0.26	Q	.	.	.	V.
16.000	92.9666	0.25	Q	.	.	.	V.
16.083	92.9682	0.24	Q	.	.	.	V.
16.167	92.9698	0.23	Q	.	.	.	V.
16.250	92.9713	0.22	Q	.	.	.	V.
16.333	92.9728	0.21	Q	.	.	.	V.
16.417	92.9742	0.20	Q	.	.	.	V.
16.500	92.9755	0.19	Q	.	.	.	V.
16.583	92.9767	0.18	Q	.	.	.	V.
16.667	92.9779	0.17	Q	.	.	.	V.
16.750	92.9791	0.17	Q	.	.	.	V.
16.833	92.9802	0.16	Q	.	.	.	V.
16.917	92.9812	0.15	Q	.	.	.	V.
17.000	92.9822	0.14	Q	.	.	.	V.
17.083	92.9832	0.14	Q	.	.	.	V.
17.167	92.9841	0.13	Q	.	.	.	V.
17.250	92.9850	0.13	Q	.	.	.	V.
17.333	92.9858	0.12	Q	.	.	.	V.
17.417	92.9866	0.11	Q	.	.	.	V.
17.500	92.9873	0.11	Q	.	.	.	V.
17.583	92.9881	0.10	Q	.	.	.	V.
17.667	92.9888	0.10	Q	.	.	.	V.
17.750	92.9894	0.10	Q	.	.	.	V.
17.833	92.9900	0.09	Q	.	.	.	V.
17.917	92.9906	0.09	Q	.	.	.	V.
18.000	92.9912	0.08	Q	.	.	.	V.
18.083	92.9918	0.08	Q	.	.	.	V.
18.167	92.9923	0.08	Q	.	.	.	V.
18.250	92.9928	0.07	Q	.	.	.	V.
18.333	92.9932	0.07	Q	.	.	.	V.
18.417	92.9937	0.07	Q	.	.	.	V.
18.500	92.9941	0.06	Q	.	.	.	V.
18.583	92.9946	0.06	Q	.	.	.	V.
18.667	92.9949	0.06	Q	.	.	.	V.
18.750	92.9953	0.05	Q	.	.	.	V.

```
  18.833     92.9957      0.05  Q         .         .         .        V.
  18.917     92.9960      0.05  Q         .         .         .        V.
  19.000     92.9964      0.05  Q         .         .         .        V.
  19.083     92.9967      0.05  Q         .         .         .        V.
  19.167     92.9970      0.04  Q         .         .         .        V.
  19.250     92.9972      0.04  Q         .         .         .        V.
  19.333     92.9975      0.04  Q         .         .         .        V.
  19.417     92.9978      0.04  Q         .         .         .        V.
  19.500     92.9980      0.04  Q         .         .         .        V.
  19.583     92.9983      0.03  Q         .         .         .        V.
  19.667     92.9985      0.03  Q         .         .         .        V.
  19.750     92.9987      0.03  Q         .         .         .        V.
  19.833     92.9989      0.03  Q         .         .         .        V.
  19.917     92.9991      0.03  Q         .         .         .        V.
  20.000     92.9993      0.03  Q         .         .         .        V.
  20.083     92.9995      0.03  Q         .         .         .        V.
  20.167     92.9997      0.02  Q         .         .         .        V.
  20.250     92.9998      0.02  Q         .         .         .        V.
  20.333     93.0000      0.02  Q         .         .         .        V.
  20.417     93.0001      0.02  Q         .         .         .        V.
  20.500     93.0003      0.02  Q         .         .         .        V.
  20.583     93.0004      0.02  Q         .         .         .        V.
  20.667     93.0005      0.02  Q         .         .         .        V.
  20.750     93.0007      0.02  Q         .         .         .        V.
  20.833     93.0008      0.02  Q         .         .         .        V.
  20.917     93.0009      0.02  Q         .         .         .        V.
  21.000     93.0010      0.02  Q         .         .         .        V.
  21.083     93.0011      0.01  Q         .         .         .        V.
  21.167     93.0012      0.01  Q         .         .         .        V.
  21.250     93.0013      0.01  Q         .         .         .        V.
  21.333     93.0014      0.01  Q         .         .         .        V.
  21.417     93.0015      0.01  Q         .         .         .        V.
  21.500     93.0015      0.01  Q         .         .         .        V.
  21.583     93.0016      0.01  Q         .         .         .        V.
  21.667     93.0017      0.01  Q         .         .         .        V.
  21.750     93.0018      0.01  Q         .         .         .        V.
  21.833     93.0018      0.01  Q         .         .         .        V.
  21.917     93.0019      0.01  Q         .         .         .        V.
  22.000     93.0020      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
               0%                            1325.0
              10%                             370.0
              20%                             260.0
              30%                             195.0
              40%                             150.0
              50%                             130.0
              60%                             110.0
              70%                              90.0
              80%                              70.0
              90%                              50.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    106.00 TO NODE    105.00 IS CODE = 5.2
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>>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<

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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2447.00
DOWNSTREAM ELEVATION(FT) = 2422.00
CHANNEL LENGTH(FT) = 1430.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 390.36
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 312.26
CHANNEL NORMAL VELOCITY FOR Q = 312.26 CFS = 16.77 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.908

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.999

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	1.30	0.96	0.96
0.167	5.69	4.55	4.55
0.250	8.09	7.47	7.47
0.333	10.33	9.75	9.75
0.417	14.77	13.62	13.62
0.500	19.28	18.11	18.11
0.583	24.46	23.12	23.12
0.667	28.66	27.57	27.57
0.750	34.66	33.10	33.10
0.833	39.88	38.53	38.53
0.917	44.06	42.98	42.98
1.000	49.54	48.12	48.12
1.083	56.20	54.47	54.47
1.167	63.68	61.74	61.74
1.250	70.29	68.58	68.58
1.333	76.63	74.99	74.99
1.417	83.44	81.68	81.68
1.500	93.13	90.62	90.62
1.583	101.52	99.35	99.35
1.667	108.87	106.96	106.96
1.750	119.04	116.41	116.41
1.833	130.72	127.69	127.69
1.917	139.99	137.59	137.59
2.000	149.06	146.71	146.71
2.083	163.33	159.63	159.63
2.167	187.29	181.09	181.09
2.250	215.46	208.17	208.17
2.333	237.00	231.42	231.42
2.417	256.47	251.42	251.42
2.500	293.41	283.84	283.84

2.583	329.45	320.11	320.11
2.667	363.68	354.82	354.82
2.750	378.07	374.34	374.34
2.833	378.48	378.37	378.37
2.917	385.92	383.99	383.99
3.000	390.36	389.21	389.21
3.083	386.07	387.18	387.18
3.167	379.91	381.51	381.51
3.250	372.82	374.66	374.66
3.333	364.24	366.46	366.46
3.417	354.48	357.01	357.01
3.500	343.91	346.65	346.65
3.583	333.00	335.82	335.82
3.667	322.00	324.85	324.85
3.750	310.15	313.22	313.22
3.833	295.17	299.05	299.05
3.917	277.92	282.39	282.39
4.000	261.06	265.43	265.43
4.083	244.89	249.08	249.08
4.167	229.44	233.44	233.44
4.250	214.71	218.52	218.52
4.333	200.67	204.31	204.31
4.417	187.29	190.76	190.76
4.500	172.23	176.13	176.13
4.583	154.52	159.10	159.10
4.667	139.07	143.07	143.07
4.750	129.75	132.17	132.17
4.833	124.10	125.56	125.56
4.917	118.97	120.30	120.30
5.000	114.01	115.29	115.29
5.083	109.19	110.43	110.43
5.167	104.48	105.70	105.70
5.250	99.88	101.07	101.07
5.333	95.43	96.58	96.58
5.417	91.14	92.25	92.25
5.500	87.04	88.10	88.10
5.583	83.10	84.12	84.12
5.667	79.34	80.31	80.31
5.750	75.74	76.67	76.67
5.833	72.31	73.20	73.20
5.917	69.04	69.88	69.88
6.000	65.91	66.72	66.72
6.083	62.92	63.70	63.70
6.167	60.07	60.81	60.81
6.250	57.35	58.05	58.05
6.333	54.75	55.42	55.42
6.417	52.27	52.91	52.91
6.500	49.90	50.52	50.52
6.583	47.64	48.23	48.23
6.667	45.48	46.04	46.04
6.750	43.42	43.96	43.96
6.833	41.46	41.97	41.97
6.917	39.58	40.07	40.07
7.000	37.79	38.25	38.25
7.083	36.07	36.52	36.52
7.167	34.44	34.86	34.86
7.250	32.88	33.28	33.28
7.333	31.39	31.78	31.78
7.417	29.97	30.34	30.34
7.500	28.61	28.96	28.96
7.583	27.31	27.65	27.65
7.667	26.08	26.40	26.40
7.750	24.90	25.20	25.20

7.833	23.77	24.06	24.06
7.917	22.69	22.97	22.97
8.000	21.66	21.93	21.93
8.083	20.68	20.94	20.94
8.167	19.74	19.99	19.99
8.250	18.85	19.08	19.08
8.333	18.00	18.22	18.22
8.417	17.18	17.39	17.39
8.500	16.40	16.60	16.60
8.583	15.66	15.85	15.85
8.667	14.95	15.13	15.13
8.750	14.27	14.45	14.45
8.833	13.63	13.79	13.79
8.917	13.01	13.17	13.17
9.000	12.42	12.57	12.57
9.083	11.86	12.00	12.00
9.167	11.32	11.46	11.46
9.250	10.81	10.94	10.94
9.333	10.32	10.44	10.44
9.417	9.85	9.97	9.97
9.500	9.40	9.52	9.52
9.583	8.98	9.09	9.09
9.667	8.57	8.68	8.68
9.750	8.18	8.28	8.28
9.833	7.81	7.91	7.91
9.917	7.46	7.55	7.55
10.000	7.12	7.21	7.21
10.083	6.80	6.88	6.88
10.167	6.49	6.57	6.57
10.250	6.20	6.27	6.27
10.333	5.92	5.99	5.99
10.417	5.65	5.72	5.72
10.500	5.39	5.46	5.46
10.583	5.15	5.21	5.21
10.667	4.91	4.97	4.97
10.750	4.69	4.75	4.75
10.833	4.48	4.53	4.53
10.917	4.28	4.33	4.33
11.000	4.08	4.13	4.13
11.083	3.90	3.95	3.95
11.167	3.72	3.77	3.77
11.250	3.55	3.60	3.60
11.333	3.39	3.43	3.43
11.417	3.24	3.28	3.28
11.500	3.09	3.13	3.13
11.583	2.95	2.99	2.99
11.667	2.82	2.85	2.85
11.750	2.69	2.72	2.72
11.833	2.57	2.60	2.60
11.917	2.45	2.48	2.48
12.000	2.34	2.37	2.37
12.083	2.23	2.26	2.26
12.167	2.13	2.16	2.16
12.250	2.04	2.06	2.06
12.333	1.94	1.97	1.97
12.417	1.86	1.88	1.88
12.500	1.77	1.79	1.79
12.583	1.69	1.71	1.71
12.667	1.62	1.64	1.64
12.750	1.54	1.56	1.56
12.833	1.47	1.49	1.49
12.917	1.41	1.42	1.42
13.000	1.34	1.36	1.36

13.083	1.28	1.30	1.30
13.167	1.22	1.24	1.24
13.250	1.17	1.18	1.18
13.333	1.11	1.13	1.13
13.417	1.06	1.08	1.08
13.500	1.02	1.03	1.03
13.583	0.97	0.98	0.98
13.667	0.93	0.94	0.94
13.750	0.88	0.89	0.89
13.833	0.84	0.85	0.85
13.917	0.81	0.82	0.82
14.000	0.77	0.78	0.78
14.083	0.73	0.74	0.74
14.167	0.70	0.71	0.71
14.250	0.67	0.68	0.68
14.333	0.64	0.65	0.65
14.417	0.61	0.62	0.62
14.500	0.58	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.53	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.48	0.49	0.49
14.917	0.46	0.47	0.47
15.000	0.44	0.45	0.45
15.083	0.42	0.43	0.43
15.167	0.40	0.41	0.41
15.250	0.38	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.33	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.30	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.26	0.27	0.27
16.000	0.25	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.18	0.19	0.19
16.667	0.17	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.14	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.11	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.10	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07

18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.05	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03
19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.03	0.03	0.03
20.083	0.03	0.03	0.03
20.167	0.02	0.03	0.03
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02
20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.02	0.02	0.02
21.000	0.02	0.02	0.02
21.083	0.01	0.02	0.02
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01

```
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     93.003 AF
    OUTFLOW VOLUME =     93.003 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =    5250.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    2713.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =      77.000 FEET
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BASIN FACTOR = 0.025
WATERSHED AREA =     147.100 ACRES
BASEFLOW =   0.000 CFS/SQUARE-MILE
WATERCOURSE "LAG" TIME =    0.203 HOURS
 CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
 THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
 MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.137
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
USER-ENTERED RAINFALL =  2.25 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9994


UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME =  40.964
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	4.421	78.653
2	22.756	326.172
3	50.537	494.222
4	67.151	295.569
5	75.644	151.079
6	81.046	96.113
7	84.952	69.478
8	87.882	52.119
9	90.206	41.358
10	92.082	33.371
11	93.624	27.422
12	94.914	22.960
13	96.046	20.128
14	96.874	14.733
15	97.668	14.121
16	98.172	8.969
17	98.466	5.228
18	98.760	5.232
19	99.054	5.228
20	99.348	5.228
21	99.641	5.228
22	99.935	5.228
23	100.000	1.149

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0114	0.0178
2	0.0292	0.0114	0.0178
3	0.0247	0.0114	0.0133
4	0.0337	0.0114	0.0223
5	0.0337	0.0114	0.0223
6	0.0405	0.0114	0.0290
7	0.0337	0.0114	0.0223
8	0.0405	0.0114	0.0290
9	0.0405	0.0114	0.0290
10	0.0337	0.0114	0.0223
11	0.0360	0.0114	0.0245
12	0.0405	0.0114	0.0290
13	0.0495	0.0114	0.0380
14	0.0495	0.0114	0.0380
15	0.0495	0.0114	0.0380
16	0.0450	0.0114	0.0335
17	0.0585	0.0114	0.0470
18	0.0607	0.0114	0.0493
19	0.0540	0.0114	0.0425
20	0.0607	0.0114	0.0493
21	0.0742	0.0114	0.0628
22	0.0697	0.0114	0.0583
23	0.0652	0.0114	0.0538
24	0.0675	0.0114	0.0560
25	0.0697	0.0114	0.0583
26	0.0944	0.0114	0.0830
27	0.1124	0.0114	0.1010
28	0.0787	0.0114	0.0673
29	0.1529	0.0114	0.1415
30	0.1642	0.0114	0.1527
31	0.1844	0.0114	0.1730
32	0.1327	0.0114	0.1212
33	0.0450	0.0114	0.0335
34	0.0405	0.0114	0.0290
35	0.0405	0.0114	0.0290
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.41
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.84

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 4.9881
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 22.5655

```
============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       75.0     150.0     225.0     300.0
----------------------------------------------------------------------------
   0.083      0.0096      1.40  Q         .         .         .         .
   0.167      0.0593      7.21  Q         .         .         .         .
   0.250      0.1670     15.65  V Q       .         .         .         .
   0.333      0.3058     20.15  V Q       .         .         .         .
   0.417      0.4680     23.55  V  Q      .         .         .         .
   0.500      0.6671     28.91  .V Q      .         .         .         .
   0.583      0.8999     33.79  .V  Q     .         .         .         .
   0.667      1.1568     37.31  . V Q     .         .         .         .
   0.750      1.4286     39.46  . V  Q    .         .         .         .
   0.833      1.7197     42.27  .  V Q    .         .         .         .
   0.917      2.0134     42.64  .  V Q    .         .         .         .
   1.000      2.3018     41.87  .   VQ    .         .         .         .
   1.083      2.6064     44.23  .   VQ    .         .         .         .
   1.167      2.9496     49.83  .    VQ   .         .         .         .
   1.250      3.3350     55.96  .    V Q  .         .         .         .
   1.333      3.7427     59.21  .     VQ  .         .         .         .
   1.417      4.1611     60.75  .      VQ .         .         .         .
   1.500      4.6051     64.47  .       Q .         .         .         .
   1.583      5.0942     71.01  .        Q.         .         .         .
   1.667      5.6076     74.55  .        Q.         .         .         .
   1.750      6.1404     77.36  .         Q         .         .         .
   1.833      6.7230     84.60  .         .Q        .         .         .
   1.917      7.3548     91.74  .         . QV      .         .         .
   2.000      7.9991     93.55  .         . Q V     .         .         .
   2.083      8.6461     93.95  .         . Q  V    .         .         .
   2.167      9.3196     97.79  .         .  Q  V   .         .         .
   2.250     10.0735    109.47  .         .   Q  V  .         .         .
   2.333     10.9433    126.29  .         .     Q  V.         .         .
   2.417     11.8955    138.27  .         .       Q .V        .         .
   2.500     12.9727    156.41  .         .         Q V       .         .
   2.583     14.3090    194.02  .         .         .    Q    .         .
   2.667     15.8440    222.89  .         .         .       VQ.         .
   2.750     17.3820    223.31  .         .         .        QV         .
   2.833     18.6458    183.51  .         .         .   Q     .  V      .
   2.917     19.5601    132.76  .         .      Q  .         .   V     .
   3.000     20.2603    101.67  .         .  Q      .         .    V    .
   3.083     20.8073     79.42  .         Q         .         .     V   .
   3.167     21.2042     57.63  .      Q  .         .         .      V  .
   3.250     21.4919     41.78  .    Q    .         .         .       V .
   3.333     21.7129     32.08  .   Q     .         .         .       V .
   3.417     21.8898     25.69  .  Q      .         .         .       V .
   3.500     22.0318     20.62  . Q       .         .         .        V.
   3.583     22.1473     16.78  . Q       .         .         .        V.
   3.667     22.2402     13.49  .Q        .         .         .        V.
   3.750     22.3137     10.68  .Q        .         .         .        V.
   3.833     22.3717      8.42  .Q        .         .         .        V.
   3.917     22.4168      6.55  Q         .         .         .        V.
   4.000     22.4535      5.33  Q         .         .         .        V.
   4.083     22.4844      4.49  Q         .         .         .        V.
   4.167     22.5108      3.84  Q         .         .         .        V.
   4.250     22.5318      3.04  Q         .         .         .        V.
   4.333     22.5471      2.23  Q         .         .         .        V.
```

```
    4.417     22.5564      1.35  Q         .         .         .        V.
    4.500     22.5609      0.65  Q         .         .         .        V.
    4.583     22.5635      0.38  Q         .         .         .        V.
    4.667     22.5650      0.22  Q         .         .         .        V.
    4.750     22.5655      0.07  Q         .         .         .        V.
    4.833     22.5655      0.01  Q         .         .         .        V.
----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                  Duration
        Peak Flow Rate                       (minutes)
    =======================                  =========
               0%                              290.0
              10%                              185.0
              20%                              125.0
              30%                               95.0
              40%                               70.0
              50%                               40.0
              60%                               30.0
              70%                               25.0
              80%                               20.0
              90%                               10.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
 ----------------------------------------------------------------------------
   >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
 ============================================================================

             STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
         (Note: Time indicated is at END of Each Unit Intervals)
 ----------------------------------------------------------------------------
  TIME(HRS) VOLUME(AF)   Q(CFS) 0.      150.0     300.0     450.0     600.0
 ----------------------------------------------------------------------------
    0.083      0.0163      2.36  Q         .         .         .         .
    0.167      0.0973     11.76  Q         .         .         .         .
    0.250      0.2565     23.11  VQ        .         .         .         .
    0.333      0.4624     29.90  VQ        .         .         .         .
    0.417      0.7184     37.17  V Q       .         .         .         .
    0.500      1.0422     47.02  V  Q      .         .         .         .
    0.583      1.4341     56.91  V  Q      .         .         .         .
    0.667      1.8810     64.88  V   Q     .         .         .         .
    0.750      2.3807     72.57  V   Q     .         .         .         .
    0.833      2.9372     80.80  .V   Q    .         .         .         .
    0.917      3.5269     85.62  .V   Q    .         .         .         .
    1.000      4.1467     89.99  .V   Q    .         .         .         .
    1.083      4.8264     98.70  .V    Q   .         .         .         .
    1.167      5.5948    111.57  .V     Q  .         .         .         .
    1.250      6.4525    124.54  . V     Q .         .         .         .
    1.333      7.3767    134.20  . V     Q .         .         .         .
    1.417      8.3577    142.43  . V      Q.         .         .         .
    1.500      9.4258    155.09  .  V      Q         .         .         .
    1.583     10.5990    170.35  .  V      .Q        .         .         .
    1.667     11.8491    181.51  .   V     . Q       .         .         .
    1.750     13.1836    193.77  .   V     . Q       .         .         .
    1.833     14.6456    212.29  .    V    .   Q     .         .         .
    1.917     16.2250    229.33  .    V    .    Q    .         .         .
    2.000     17.8797    240.26  .     V   .     Q   .         .         .
    2.083     19.6261    253.58  .     V   .     Q   .         .         .
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2.167     21.5468    278.88  .      V  .       Q .         .         .
2.250     23.7343    317.63  .       V .         .Q        .         .
2.333     26.1979    357.71  .        V.         .  Q      .         .
2.417     28.8817    389.69  .        V.         .    Q    .         .
2.500     31.9138    440.25  .         .V        .        Q.         .
2.583     35.4546    514.14  .         . V       .         .   Q     .
2.667     39.4333    577.70  .         .  V      .         .       Q .
2.750     43.5493    597.65  .         .    V    .         .        Q.
2.833     47.4190    561.88  .         .     V   .         .      Q  .
2.917     50.9779    516.75  .         .      V  .         .   Q     .
3.000     54.3586    490.88  .         .       V .         . Q       .
3.083     57.5721    466.60  .         .        V.         .Q        .
3.167     60.5964    439.13  .         .         V        Q.         .
3.250     63.4645    416.44  .         .         .V     Q  .         .
3.333     66.2092    398.54  .         .         . V   Q   .         .
3.417     68.8449    382.70  .         .         .  V Q    .         .
3.500     71.3743    367.27  .         .         .   Q     .         .
3.583     73.8027    352.60  .         .         .  Q V    .         .
3.667     76.1328    338.33  .         .         . Q   V   .         .
3.750     78.3635    323.89  .         .         .Q     V  .         .
3.833     80.4810    307.46  .         .         Q      V  .         .
3.917     82.4709    288.94  .         .        Q.       V .         .
4.000     84.3356    270.76  .         .       Q .        V.         .
4.083     86.0820    253.57  .         .     Q   .        V.         .
4.167     87.7161    237.28  .         .    Q    .         V         .
4.250     89.2420    221.56  .         .   Q     .         V         .
4.333     90.6644    206.53  .         .  Q      .         .V        .
4.417     91.9874    192.10  .         . Q       .         .V        .
4.500     93.2049    176.78  .         .Q        .         . V       .
4.583     94.3033    159.48  .         Q         .         . V       .
4.667     95.2901    143.29  .        Q.         .         . V       .
4.750     96.2008    132.23  .       Q .         .         .  V      .
4.833     97.0657    125.57  .       Q .         .         .  V      .
4.917     97.8941    120.30  .       Q .         .         .  V      .
5.000     98.6882    115.29  .      Q  .         .         .   V     .
5.083     99.4487    110.43  .      Q  .         .         .   V     .
5.167    100.1767    105.70  .      Q  .         .         .   V     .
5.250    100.8728    101.07  .     Q   .         .         .   V     .
5.333    101.5379     96.58  .     Q   .         .         .    V    .
5.417    102.1733     92.25  .     Q   .         .         .    V    .
5.500    102.7801     88.10  .    Q    .         .         .    V    .
5.583    103.3594     84.12  .    Q    .         .         .    V    .
5.667    103.9125     80.31  .    Q    .         .         .    V    .
5.750    104.4405     76.67  .    Q    .         .         .     V   .
5.833    104.9447     73.20  .   Q     .         .         .     V   .
5.917    105.4260     69.88  .   Q     .         .         .     V   .
6.000    105.8855     66.72  .   Q     .         .         .     V   .
6.083    106.3241     63.70  .   Q     .         .         .     V   .
6.167    106.7429     60.81  .   Q     .         .         .     V   .
6.250    107.1428     58.05  .  Q      .         .         .      V  .
6.333    107.5245     55.42  .  Q      .         .         .      V  .
6.417    107.8889     52.91  .  Q      .         .         .      V  .
6.500    108.2368     50.52  .  Q      .         .         .      V  .
6.583    108.5690     48.23  .  Q      .         .         .      V  .
6.667    108.8861     46.04  .  Q      .         .         .      V  .
6.750    109.1888     43.96  . Q       .         .         .      V  .
6.833    109.4778     41.97  . Q       .         .         .      V  .
6.917    109.7538     40.07  . Q       .         .         .      V  .
7.000    110.0172     38.25  . Q       .         .         .       V .
7.083    110.2687     36.52  . Q       .         .         .       V .
7.167    110.5088     34.86  . Q       .         .         .       V .
7.250    110.7380     33.28  . Q       .         .         .       V .
7.333    110.9569     31.78  . Q       .         .         .       V .
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7.417	111.1658	30.34	. Q	.	.	.	V .
7.500	111.3653	28.96	.Q	.	.	.	V .
7.583	111.5557	27.65	.Q	.	.	.	V .
7.667	111.7375	26.40	.Q	.	.	.	V .
7.750	111.9110	25.20	.Q	.	.	.	V .
7.833	112.0768	24.06	.Q	.	.	.	V .
7.917	112.2349	22.97	.Q	.	.	.	V .
8.000	112.3860	21.93	.Q	.	.	.	V .
8.083	112.5302	20.94	.Q	.	.	.	V .
8.167	112.6678	19.99	.Q	.	.	.	V .
8.250	112.7992	19.08	.Q	.	.	.	V.
8.333	112.9247	18.22	.Q	.	.	.	V.
8.417	113.0445	17.39	.Q	.	.	.	V.
8.500	113.1588	16.60	.Q	.	.	.	V.
8.583	113.2680	15.85	.Q	.	.	.	V.
8.667	113.3722	15.13	.Q	.	.	.	V.
8.750	113.4718	14.45	Q	.	.	.	V.
8.833	113.5668	13.79	Q	.	.	.	V.
8.917	113.6575	13.17	Q	.	.	.	V.
9.000	113.7440	12.57	Q	.	.	.	V.
9.083	113.8267	12.00	Q	.	.	.	V.
9.167	113.9056	11.46	Q	.	.	.	V.
9.250	113.9810	10.94	Q	.	.	.	V.
9.333	114.0529	10.44	Q	.	.	.	V.
9.417	114.1216	9.97	Q	.	.	.	V.
9.500	114.1871	9.52	Q	.	.	.	V.
9.583	114.2497	9.09	Q	.	.	.	V.
9.667	114.3095	8.68	Q	.	.	.	V.
9.750	114.3665	8.28	Q	.	.	.	V.
9.833	114.4210	7.91	Q	.	.	.	V.
9.917	114.4730	7.55	Q	.	.	.	V.
10.000	114.5226	7.21	Q	.	.	.	V.
10.083	114.5700	6.88	Q	.	.	.	V.
10.167	114.6153	6.57	Q	.	.	.	V.
10.250	114.6585	6.27	Q	.	.	.	V.
10.333	114.6997	5.99	Q	.	.	.	V.
10.417	114.7391	5.72	Q	.	.	.	V.
10.500	114.7767	5.46	Q	.	.	.	V.
10.583	114.8125	5.21	Q	.	.	.	V.
10.667	114.8468	4.97	Q	.	.	.	V.
10.750	114.8795	4.75	Q	.	.	.	V.
10.833	114.9107	4.53	Q	.	.	.	V.
10.917	114.9405	4.33	Q	.	.	.	V.
11.000	114.9690	4.13	Q	.	.	.	V.
11.083	114.9962	3.95	Q	.	.	.	V.
11.167	115.0221	3.77	Q	.	.	.	V.
11.250	115.0469	3.60	Q	.	.	.	V.
11.333	115.0705	3.43	Q	.	.	.	V.
11.417	115.0931	3.28	Q	.	.	.	V.
11.500	115.1146	3.13	Q	.	.	.	V.
11.583	115.1352	2.99	Q	.	.	.	V.
11.667	115.1549	2.85	Q	.	.	.	V.
11.750	115.1736	2.72	Q	.	.	.	V.
11.833	115.1915	2.60	Q	.	.	.	V.
11.917	115.2086	2.48	Q	.	.	.	V.
12.000	115.2249	2.37	Q	.	.	.	V.
12.083	115.2405	2.26	Q	.	.	.	V.
12.167	115.2554	2.16	Q	.	.	.	V.
12.250	115.2696	2.06	Q	.	.	.	V.
12.333	115.2831	1.97	Q	.	.	.	V.
12.417	115.2961	1.88	Q	.	.	.	V.
12.500	115.3084	1.79	Q	.	.	.	V.
12.583	115.3202	1.71	Q	.	.	.	V.

12.667	115.3315	1.64	Q	.	.	.	V.
12.750	115.3422	1.56	Q	.	.	.	V.
12.833	115.3525	1.49	Q	.	.	.	V.
12.917	115.3623	1.42	Q	.	.	.	V.
13.000	115.3716	1.36	Q	.	.	.	V.
13.083	115.3806	1.30	Q	.	.	.	V.
13.167	115.3891	1.24	Q	.	.	.	V.
13.250	115.3972	1.18	Q	.	.	.	V.
13.333	115.4050	1.13	Q	.	.	.	V.
13.417	115.4124	1.08	Q	.	.	.	V.
13.500	115.4195	1.03	Q	.	.	.	V.
13.583	115.4263	0.98	Q	.	.	.	V.
13.667	115.4327	0.94	Q	.	.	.	V.
13.750	115.4389	0.89	Q	.	.	.	V.
13.833	115.4448	0.85	Q	.	.	.	V.
13.917	115.4504	0.82	Q	.	.	.	V.
14.000	115.4557	0.78	Q	.	.	.	V.
14.083	115.4609	0.74	Q	.	.	.	V.
14.167	115.4658	0.71	Q	.	.	.	V.
14.250	115.4704	0.68	Q	.	.	.	V.
14.333	115.4749	0.65	Q	.	.	.	V.
14.417	115.4791	0.62	Q	.	.	.	V.
14.500	115.4832	0.59	Q	.	.	.	V.
14.583	115.4871	0.56	Q	.	.	.	V.
14.667	115.4908	0.54	Q	.	.	.	V.
14.750	115.4943	0.51	Q	.	.	.	V.
14.833	115.4977	0.49	Q	.	.	.	V.
14.917	115.5009	0.47	Q	.	.	.	V.
15.000	115.5040	0.45	Q	.	.	.	V.
15.083	115.5069	0.43	Q	.	.	.	V.
15.167	115.5097	0.41	Q	.	.	.	V.
15.250	115.5124	0.39	Q	.	.	.	V.
15.333	115.5149	0.37	Q	.	.	.	V.
15.417	115.5174	0.35	Q	.	.	.	V.
15.500	115.5197	0.34	Q	.	.	.	V.
15.583	115.5219	0.32	Q	.	.	.	V.
15.667	115.5240	0.31	Q	.	.	.	V.
15.750	115.5261	0.29	Q	.	.	.	V.
15.833	115.5280	0.28	Q	.	.	.	V.
15.917	115.5299	0.27	Q	.	.	.	V.
16.000	115.5316	0.26	Q	.	.	.	V.
16.083	115.5333	0.24	Q	.	.	.	V.
16.167	115.5349	0.23	Q	.	.	.	V.
16.250	115.5364	0.22	Q	.	.	.	V.
16.333	115.5379	0.21	Q	.	.	.	V.
16.417	115.5393	0.20	Q	.	.	.	V.
16.500	115.5406	0.19	Q	.	.	.	V.
16.583	115.5419	0.19	Q	.	.	.	V.
16.667	115.5431	0.18	Q	.	.	.	V.
16.750	115.5443	0.17	Q	.	.	.	V.
16.833	115.5454	0.16	Q	.	.	.	V.
16.917	115.5465	0.15	Q	.	.	.	V.
17.000	115.5475	0.15	Q	.	.	.	V.
17.083	115.5484	0.14	Q	.	.	.	V.
17.167	115.5493	0.13	Q	.	.	.	V.
17.250	115.5502	0.13	Q	.	.	.	V.
17.333	115.5511	0.12	Q	.	.	.	V.
17.417	115.5519	0.12	Q	.	.	.	V.
17.500	115.5526	0.11	Q	.	.	.	V.
17.583	115.5534	0.11	Q	.	.	.	V.
17.667	115.5541	0.10	Q	.	.	.	V.
17.750	115.5547	0.10	Q	.	.	.	V.
17.833	115.5554	0.09	Q	.	.	.	V.

```
  17.917    115.5560      0.09  Q         .         .         .        V.
  18.000    115.5565      0.08  Q         .         .         .        V.
  18.083    115.5571      0.08  Q         .         .         .        V.
  18.167    115.5576      0.08  Q         .         .         .        V.
  18.250    115.5581      0.07  Q         .         .         .        V.
  18.333    115.5586      0.07  Q         .         .         .        V.
  18.417    115.5591      0.07  Q         .         .         .        V.
  18.500    115.5595      0.06  Q         .         .         .        V.
  18.583    115.5599      0.06  Q         .         .         .        V.
  18.667    115.5603      0.06  Q         .         .         .        V.
  18.750    115.5607      0.06  Q         .         .         .        V.
  18.833    115.5611      0.05  Q         .         .         .        V.
  18.917    115.5614      0.05  Q         .         .         .        V.
  19.000    115.5618      0.05  Q         .         .         .        V.
  19.083    115.5621      0.05  Q         .         .         .        V.
  19.167    115.5624      0.04  Q         .         .         .        V.
  19.250    115.5627      0.04  Q         .         .         .        V.
  19.333    115.5630      0.04  Q         .         .         .        V.
  19.417    115.5632      0.04  Q         .         .         .        V.
  19.500    115.5635      0.04  Q         .         .         .        V.
  19.583    115.5637      0.03  Q         .         .         .        V.
  19.667    115.5639      0.03  Q         .         .         .        V.
  19.750    115.5642      0.03  Q         .         .         .        V.
  19.833    115.5644      0.03  Q         .         .         .        V.
  19.917    115.5646      0.03  Q         .         .         .        V.
  20.000    115.5648      0.03  Q         .         .         .        V.
  20.083    115.5649      0.03  Q         .         .         .        V.
  20.167    115.5651      0.03  Q         .         .         .        V.
  20.250    115.5653      0.02  Q         .         .         .        V.
  20.333    115.5654      0.02  Q         .         .         .        V.
  20.417    115.5656      0.02  Q         .         .         .        V.
  20.500    115.5657      0.02  Q         .         .         .        V.
  20.583    115.5659      0.02  Q         .         .         .        V.
  20.667    115.5660      0.02  Q         .         .         .        V.
  20.750    115.5661      0.02  Q         .         .         .        V.
  20.833    115.5662      0.02  Q         .         .         .        V.
  20.917    115.5664      0.02  Q         .         .         .        V.
  21.000    115.5665      0.02  Q         .         .         .        V.
  21.083    115.5666      0.02  Q         .         .         .        V.
  21.167    115.5667      0.01  Q         .         .         .        V.
  21.250    115.5668      0.01  Q         .         .         .        V.
  21.333    115.5669      0.01  Q         .         .         .        V.
  21.417    115.5669      0.01  Q         .         .         .        V.
  21.500    115.5670      0.01  Q         .         .         .        V.
  21.583    115.5671      0.01  Q         .         .         .        V.
  21.667    115.5672      0.01  Q         .         .         .        V.
  21.750    115.5672      0.01  Q         .         .         .        V.
  21.833    115.5673      0.01  Q         .         .         .        V.
  21.917    115.5674      0.01  Q         .         .         .        V.
  22.000    115.5674      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                             1325.0
             10%                              335.0
             20%                              225.0
             30%                              170.0
```

40%	130.0
50%	100.0
60%	70.0
70%	45.0
80%	30.0
90%	15.0

****

FLOW PROCESS FROM NODE 105.00 TO NODE 105.00 IS CODE = 1

>>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

==

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 7.100 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
Warning: Watershed Area is less than 10 acres
*USER ENTERED "LAG" TIME = 0.100 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.150
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
USER-ENTERED RAINFALL = 2.25 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 83.333

==

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	12.016
2	59.664	39.215
3	78.792	16.425
4	86.766	6.847
5	91.428	4.003
6	94.514	2.650
7	96.650	1.834
8	98.044	1.197
9	98.699	0.562
10	99.289	0.507
11	99.716	0.366
12	99.929	0.183
13	100.000	0.061

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0125	0.0168
2	0.0292	0.0125	0.0168
3	0.0247	0.0124	0.0124
4	0.0337	0.0125	0.0213
5	0.0337	0.0125	0.0213
6	0.0405	0.0125	0.0280
7	0.0337	0.0125	0.0213
8	0.0405	0.0125	0.0280
9	0.0405	0.0125	0.0280
10	0.0337	0.0125	0.0213
11	0.0360	0.0125	0.0235
12	0.0405	0.0125	0.0280
13	0.0495	0.0125	0.0370
14	0.0495	0.0125	0.0370
15	0.0495	0.0125	0.0370
16	0.0450	0.0125	0.0325
17	0.0585	0.0125	0.0460
18	0.0607	0.0125	0.0483
19	0.0540	0.0125	0.0415
20	0.0607	0.0125	0.0483
21	0.0742	0.0125	0.0618
22	0.0697	0.0125	0.0573
23	0.0652	0.0125	0.0528
24	0.0675	0.0125	0.0550
25	0.0697	0.0125	0.0573
26	0.0945	0.0125	0.0820
27	0.1125	0.0125	0.1000
28	0.0787	0.0125	0.0663
29	0.1530	0.0125	0.1405
30	0.1642	0.0125	0.1518
31	0.1845	0.0125	0.1720
32	0.1327	0.0125	0.1203
33	0.0450	0.0125	0.0325
34	0.0405	0.0125	0.0280
35	0.0405	0.0125	0.0280
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.44
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.81

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.2626
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.0681

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============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        5.0      10.0      15.0      20.0
----------------------------------------------------------------------------
   0.083      0.0014      0.20  Q         .         .         .         .
   0.167      0.0073      0.86  VQ        .         .         .         .
   0.250      0.0147      1.08  V Q       .         .         .         .
   0.333      0.0225      1.13  V Q       .         .         .         .
   0.417      0.0327      1.47  .VQ       .         .         .         .
   0.500      0.0445      1.72  .V Q      .         .         .         .
   0.583      0.0581      1.97  . VQ      .         .         .         .
   0.667      0.0715      1.94  . VQ      .         .         .         .
   0.750      0.0864      2.17  .  VQ     .         .         .         .
   0.833      0.1016      2.20  .  VQ     .         .         .         .
   0.917      0.1154      2.01  .   Q     .         .         .         .
   1.000      0.1297      2.07  .   Q     .         .         .         .
   1.083      0.1460      2.36  .   QV    .         .         .         .
   1.167      0.1652      2.79  .    QV   .         .         .         .
   1.250      0.1857      2.97  .    QV   .         .         .         .
   1.333      0.2063      2.99  .    Q V  .         .         .         .
   1.417      0.2271      3.02  .     Q V .         .         .         .
   1.500      0.2515      3.54  .      Q V.         .         .         .
   1.583      0.2773      3.76  .      Q  V         .         .         .
   1.667      0.3028      3.70  .      Q  .V        .         .         .
   1.750      0.3309      4.08  .       Q . V       .         .         .
   1.833      0.3630      4.66  .        Q.  V      .         .         .
   1.917      0.3954      4.70  .        Q.   V     .         .         .
   2.000      0.4270      4.60  .        Q.    V    .         .         .
   2.083      0.4593      4.68  .        Q.      V  .         .         .
   2.167      0.4944      5.10  .         Q       V .         .         .
   2.250      0.5380      6.34  .         . Q       V         .         .
   2.333      0.5867      7.07  .         .   Q     .V        .         .
   2.417      0.6358      7.12  .         .   Q     .  V      .         .
   2.500      0.7035      9.84  .         .        Q.     V   .         .
   2.583      0.7838     11.66  .         .         .  Q     V.         .
   2.667      0.8698     12.49  .         .         .   Q     . V       .
   2.750      0.9393     10.08  .         .         Q         .    V    .
   2.833      0.9813      6.09  .         . Q       .         .     V   .
   2.917      1.0112      4.35  .       Q .         .         .      V  .
   3.000      1.0345      3.38  .     Q   .         .         .       V .
   3.083      1.0485      2.03  .   Q     .         .         .        V.
   3.167      1.0563      1.13  . Q       .         .         .        V.
   3.250      1.0609      0.68  .Q        .         .         .        V.
   3.333      1.0639      0.43  Q         .         .         .        V.
   3.417      1.0658      0.28  Q         .         .         .        V.
   3.500      1.0670      0.16  Q         .         .         .        V.
   3.583      1.0675      0.08  Q         .         .         .        V.
   3.667      1.0678      0.04  Q         .         .         .        V.
   3.750      1.0680      0.02  Q         .         .         .        V.
   3.833      1.0680      0.01  Q         .         .         .        V.
----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	230.0
10%	165.0
20%	115.0
30%	80.0
40%	45.0
50%	35.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0177      2.57  Q         .         .         .         .
   0.167      0.1046     12.62  Q         .         .         .         .
   0.250      0.2712     24.20  VQ        .         .         .         .
   0.333      0.4849     31.03  VQ        .         .         .         .
   0.417      0.7510     38.64  V Q       .         .         .         .
   0.500      1.0867     48.73  V Q       .         .         .         .
   0.583      1.4922     58.89  V  Q      .         .         .         .
   0.667      1.9525     66.83  V  Q      .         .         .         .
   0.750      2.4672     74.73  V   Q     .         .         .         .
   0.833      3.0388     83.00  .V  Q     .         .         .         .
   0.917      3.6423     87.63  .V   Q    .         .         .         .
   1.000      4.2764     92.06  .V   Q    .         .         .         .
   1.083      4.9724    101.06  .V   Q    .         .         .         .
   1.167      5.7600    114.36  .V    Q   .         .         .         .
   1.250      6.6382    127.51  . V    Q  .         .         .         .
   1.333      7.5830    137.19  . V    Q  .         .         .         .
   1.417      8.5848    145.46  . V     Q .         .         .         .
   1.500      9.6772    158.63  .  V     Q.         .         .         .
   1.583     10.8763    174.11  .  V     Q.         .         .         .
   1.667     12.1519    185.21  .   V     Q         .         .         .
   1.750     13.5145    197.84  .   V     .Q        .         .         .
   1.833     15.0086    216.95  .    V    . Q       .         .         .
   1.917     16.6204    234.03  .    V    .  Q      .         .         .
   2.000     18.3068    244.86  .     V   .  Q      .         .         .
   2.083     20.0854    258.26  .     V   .   Q     .         .         .
   2.167     22.0411    283.97  .      V  .     Q   .         .         .
   2.250     24.2724    323.98  .       V .       Q .         .         .
   2.333     26.7846    364.78  .        V.         Q         .         .
   2.417     29.5175    396.81  .         V         . Q       .         .
   2.500     32.6173    450.09  .         .V        .    Q    .         .
   2.583     36.2385    525.80  .         . V       .         Q         .
   2.667     40.3031    590.19  .         .  V      .         . Q       .
   2.750     44.4886    607.73  .         .    V    .         .  Q      .
   2.833     48.4002    567.97  .         .     V   .         . Q       .
   2.917     51.9891    521.10  .         .      V  .        Q.         .
   3.000     55.3931    494.26  .         .       V .       Q .         .
   3.083     58.6205    468.63  .         .         V     Q   .         .
```

```
3.167     61.6527    440.27  .         .         .V   Q    .         .
3.250     64.5254    417.12  .         .         . VQ      .         .
3.333     67.2732    398.97  .         .         . QV      .         .
3.417     69.9108    382.98  .         .         .Q V      .         .
3.500     72.4413    367.43  .         .         Q   V     .         .
3.583     74.8702    352.68  .         .         Q    V    .         .
3.667     77.2006    338.38  .         .        Q.     V   .         .
3.750     79.4314    323.91  .         .       Q .      V  .         .
3.833     81.5490    307.47  .         .      Q  .      V  .         .
3.917     83.5390    288.94  .         .     Q   .       V .         .
4.000     85.4037    270.76  .         .    Q    .        V.         .
4.083     87.1500    253.57  .         .   Q     .        V.         .
4.167     88.7842    237.28  .         .  Q      .         V         .
4.250     90.3101    221.56  .         . Q       .         V         .
4.333     91.7325    206.53  .         .Q        .         .V        .
4.417     93.0555    192.10  .         Q         .         .V        .
4.500     94.2730    176.78  .         Q         .         . V       .
4.583     95.3714    159.48  .        Q.         .         . V       .
4.667     96.3582    143.29  .       Q .         .         .  V      .
4.750     97.2689    132.23  .      Q  .         .         .  V      .
4.833     98.1337    125.57  .      Q  .         .         .  V      .
4.917     98.9622    120.30  .     Q   .         .         .  V      .
5.000     99.7562    115.29  .     Q   .         .         .   V     .
5.083    100.5168    110.43  .     Q   .         .         .   V     .
5.167    101.2447    105.70  .     Q   .         .         .   V     .
5.250    101.9408    101.07  .    Q    .         .         .   V     .
5.333    102.6060     96.58  .    Q    .         .         .    V    .
5.417    103.2414     92.25  .    Q    .         .         .    V    .
5.500    103.8481     88.10  .    Q    .         .         .    V    .
5.583    104.4274     84.12  .   Q     .         .         .    V    .
5.667    104.9805     80.31  .   Q     .         .         .     V   .
5.750    105.5086     76.67  .   Q     .         .         .     V   .
5.833    106.0127     73.20  .   Q     .         .         .     V   .
5.917    106.4940     69.88  .  Q      .         .         .     V   .
6.000    106.9535     66.72  .  Q      .         .         .     V   .
6.083    107.3922     63.70  .  Q      .         .         .     V   .
6.167    107.8110     60.81  .  Q      .         .         .     V   .
6.250    108.2108     58.05  .  Q      .         .         .      V  .
6.333    108.5925     55.42  .  Q      .         .         .      V  .
6.417    108.9569     52.91  .  Q      .         .         .      V  .
6.500    109.3049     50.52  . Q       .         .         .      V  .
6.583    109.6370     48.23  . Q       .         .         .      V  .
6.667    109.9541     46.04  . Q       .         .         .      V  .
6.750    110.2569     43.96  . Q       .         .         .      V  .
6.833    110.5459     41.97  . Q       .         .         .      V  .
6.917    110.8218     40.07  . Q       .         .         .       V .
7.000    111.0853     38.25  . Q       .         .         .       V .
7.083    111.3367     36.52  . Q       .         .         .       V .
7.167    111.5769     34.86  .Q        .         .         .       V .
7.250    111.8061     33.28  .Q        .         .         .       V .
7.333    112.0249     31.78  .Q        .         .         .       V .
7.417    112.2338     30.34  .Q        .         .         .       V .
7.500    112.4333     28.96  .Q        .         .         .       V .
7.583    112.6237     27.65  .Q        .         .         .       V .
7.667    112.8055     26.40  .Q        .         .         .       V .
7.750    112.9791     25.20  .Q        .         .         .       V .
7.833    113.1448     24.06  .Q        .         .         .       V .
7.917    113.3030     22.97  .Q        .         .         .       V .
8.000    113.4540     21.93  .Q        .         .         .       V .
8.083    113.5982     20.94  .Q        .         .         .       V .
8.167    113.7359     19.99  .Q        .         .         .        V.
8.250    113.8673     19.08  .Q        .         .         .        V.
8.333    113.9928     18.22  .Q        .         .         .        V.
```

8.417	114.1125	17.39	Q	.	.	.	V.
8.500	114.2269	16.60	Q	.	.	.	V.
8.583	114.3361	15.85	Q	.	.	.	V.
8.667	114.4403	15.13	Q	.	.	.	V.
8.750	114.5398	14.45	Q	.	.	.	V.
8.833	114.6348	13.79	Q	.	.	.	V.
8.917	114.7255	13.17	Q	.	.	.	V.
9.000	114.8121	12.57	Q	.	.	.	V.
9.083	114.8948	12.00	Q	.	.	.	V.
9.167	114.9737	11.46	Q	.	.	.	V.
9.250	115.0490	10.94	Q	.	.	.	V.
9.333	115.1210	10.44	Q	.	.	.	V.
9.417	115.1896	9.97	Q	.	.	.	V.
9.500	115.2552	9.52	Q	.	.	.	V.
9.583	115.3178	9.09	Q	.	.	.	V.
9.667	115.3775	8.68	Q	.	.	.	V.
9.750	115.4346	8.28	Q	.	.	.	V.
9.833	115.4890	7.91	Q	.	.	.	V.
9.917	115.5410	7.55	Q	.	.	.	V.
10.000	115.5907	7.21	Q	.	.	.	V.
10.083	115.6381	6.88	Q	.	.	.	V.
10.167	115.6833	6.57	Q	.	.	.	V.
10.250	115.7265	6.27	Q	.	.	.	V.
10.333	115.7678	5.99	Q	.	.	.	V.
10.417	115.8071	5.72	Q	.	.	.	V.
10.500	115.8447	5.46	Q	.	.	.	V.
10.583	115.8806	5.21	Q	.	.	.	V.
10.667	115.9148	4.97	Q	.	.	.	V.
10.750	115.9476	4.75	Q	.	.	.	V.
10.833	115.9788	4.53	Q	.	.	.	V.
10.917	116.0086	4.33	Q	.	.	.	V.
11.000	116.0370	4.13	Q	.	.	.	V.
11.083	116.0642	3.95	Q	.	.	.	V.
11.167	116.0902	3.77	Q	.	.	.	V.
11.250	116.1149	3.60	Q	.	.	.	V.
11.333	116.1386	3.43	Q	.	.	.	V.
11.417	116.1611	3.28	Q	.	.	.	V.
11.500	116.1827	3.13	Q	.	.	.	V.
11.583	116.2033	2.99	Q	.	.	.	V.
11.667	116.2229	2.85	Q	.	.	.	V.
11.750	116.2417	2.72	Q	.	.	.	V.
11.833	116.2596	2.60	Q	.	.	.	V.
11.917	116.2766	2.48	Q	.	.	.	V.
12.000	116.2930	2.37	Q	.	.	.	V.
12.083	116.3085	2.26	Q	.	.	.	V.
12.167	116.3234	2.16	Q	.	.	.	V.
12.250	116.3376	2.06	Q	.	.	.	V.
12.333	116.3512	1.97	Q	.	.	.	V.
12.417	116.3641	1.88	Q	.	.	.	V.
12.500	116.3765	1.79	Q	.	.	.	V.
12.583	116.3883	1.71	Q	.	.	.	V.
12.667	116.3995	1.64	Q	.	.	.	V.
12.750	116.4103	1.56	Q	.	.	.	V.
12.833	116.4205	1.49	Q	.	.	.	V.
12.917	116.4303	1.42	Q	.	.	.	V.
13.000	116.4397	1.36	Q	.	.	.	V.
13.083	116.4486	1.30	Q	.	.	.	V.
13.167	116.4571	1.24	Q	.	.	.	V.
13.250	116.4653	1.18	Q	.	.	.	V.
13.333	116.4731	1.13	Q	.	.	.	V.
13.417	116.4805	1.08	Q	.	.	.	V.
13.500	116.4876	1.03	Q	.	.	.	V.
13.583	116.4943	0.98	Q	.	.	.	V.

13.667	116.5008	0.94	Q	.	.	.	V.
13.750	116.5069	0.89	Q	.	.	.	V.
13.833	116.5128	0.85	Q	.	.	.	V.
13.917	116.5184	0.82	Q	.	.	.	V.
14.000	116.5238	0.78	Q	.	.	.	V.
14.083	116.5289	0.74	Q	.	.	.	V.
14.167	116.5338	0.71	Q	.	.	.	V.
14.250	116.5385	0.68	Q	.	.	.	V.
14.333	116.5429	0.65	Q	.	.	.	V.
14.417	116.5472	0.62	Q	.	.	.	V.
14.500	116.5512	0.59	Q	.	.	.	V.
14.583	116.5551	0.56	Q	.	.	.	V.
14.667	116.5588	0.54	Q	.	.	.	V.
14.750	116.5624	0.51	Q	.	.	.	V.
14.833	116.5657	0.49	Q	.	.	.	V.
14.917	116.5689	0.47	Q	.	.	.	V.
15.000	116.5720	0.45	Q	.	.	.	V.
15.083	116.5750	0.43	Q	.	.	.	V.
15.167	116.5778	0.41	Q	.	.	.	V.
15.250	116.5804	0.39	Q	.	.	.	V.
15.333	116.5830	0.37	Q	.	.	.	V.
15.417	116.5854	0.35	Q	.	.	.	V.
15.500	116.5878	0.34	Q	.	.	.	V.
15.583	116.5900	0.32	Q	.	.	.	V.
15.667	116.5921	0.31	Q	.	.	.	V.
15.750	116.5941	0.29	Q	.	.	.	V.
15.833	116.5961	0.28	Q	.	.	.	V.
15.917	116.5979	0.27	Q	.	.	.	V.
16.000	116.5997	0.26	Q	.	.	.	V.
16.083	116.6014	0.24	Q	.	.	.	V.
16.167	116.6030	0.23	Q	.	.	.	V.
16.250	116.6045	0.22	Q	.	.	.	V.
16.333	116.6060	0.21	Q	.	.	.	V.
16.417	116.6074	0.20	Q	.	.	.	V.
16.500	116.6087	0.19	Q	.	.	.	V.
16.583	116.6100	0.19	Q	.	.	.	V.
16.667	116.6112	0.18	Q	.	.	.	V.
16.750	116.6123	0.17	Q	.	.	.	V.
16.833	116.6134	0.16	Q	.	.	.	V.
16.917	116.6145	0.15	Q	.	.	.	V.
17.000	116.6155	0.15	Q	.	.	.	V.
17.083	116.6165	0.14	Q	.	.	.	V.
17.167	116.6174	0.13	Q	.	.	.	V.
17.250	116.6183	0.13	Q	.	.	.	V.
17.333	116.6191	0.12	Q	.	.	.	V.
17.417	116.6199	0.12	Q	.	.	.	V.
17.500	116.6207	0.11	Q	.	.	.	V.
17.583	116.6214	0.11	Q	.	.	.	V.
17.667	116.6221	0.10	Q	.	.	.	V.
17.750	116.6228	0.10	Q	.	.	.	V.
17.833	116.6234	0.09	Q	.	.	.	V.
17.917	116.6240	0.09	Q	.	.	.	V.
18.000	116.6246	0.08	Q	.	.	.	V.
18.083	116.6252	0.08	Q	.	.	.	V.
18.167	116.6257	0.08	Q	.	.	.	V.
18.250	116.6262	0.07	Q	.	.	.	V.
18.333	116.6267	0.07	Q	.	.	.	V.
18.417	116.6271	0.07	Q	.	.	.	V.
18.500	116.6276	0.06	Q	.	.	.	V.
18.583	116.6280	0.06	Q	.	.	.	V.
18.667	116.6284	0.06	Q	.	.	.	V.
18.750	116.6288	0.06	Q	.	.	.	V.
18.833	116.6291	0.05	Q	.	.	.	V.

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  18.917    116.6295      0.05  Q         .         .         .        V.
  19.000    116.6298      0.05  Q         .         .         .        V.
  19.083    116.6301      0.05  Q         .         .         .        V.
  19.167    116.6304      0.04  Q         .         .         .        V.
  19.250    116.6307      0.04  Q         .         .         .        V.
  19.333    116.6310      0.04  Q         .         .         .        V.
  19.417    116.6313      0.04  Q         .         .         .        V.
  19.500    116.6315      0.04  Q         .         .         .        V.
  19.583    116.6318      0.03  Q         .         .         .        V.
  19.667    116.6320      0.03  Q         .         .         .        V.
  19.750    116.6322      0.03  Q         .         .         .        V.
  19.833    116.6324      0.03  Q         .         .         .        V.
  19.917    116.6326      0.03  Q         .         .         .        V.
  20.000    116.6328      0.03  Q         .         .         .        V.
  20.083    116.6330      0.03  Q         .         .         .        V.
  20.167    116.6332      0.03  Q         .         .         .        V.
  20.250    116.6333      0.02  Q         .         .         .        V.
  20.333    116.6335      0.02  Q         .         .         .        V.
  20.417    116.6336      0.02  Q         .         .         .        V.
  20.500    116.6338      0.02  Q         .         .         .        V.
  20.583    116.6339      0.02  Q         .         .         .        V.
  20.667    116.6341      0.02  Q         .         .         .        V.
  20.750    116.6342      0.02  Q         .         .         .        V.
  20.833    116.6343      0.02  Q         .         .         .        V.
  20.917    116.6344      0.02  Q         .         .         .        V.
  21.000    116.6345      0.02  Q         .         .         .        V.
  21.083    116.6346      0.02  Q         .         .         .        V.
  21.167    116.6347      0.01  Q         .         .         .        V.
  21.250    116.6348      0.01  Q         .         .         .        V.
  21.333    116.6349      0.01  Q         .         .         .        V.
  21.417    116.6350      0.01  Q         .         .         .        V.
  21.500    116.6351      0.01  Q         .         .         .        V.
  21.583    116.6352      0.01  Q         .         .         .        V.
  21.667    116.6352      0.01  Q         .         .         .        V.
  21.750    116.6353      0.01  Q         .         .         .        V.
  21.833    116.6354      0.01  Q         .         .         .        V.
  21.917    116.6354      0.01  Q         .         .         .        V.
  22.000    116.6355      0.01  Q         .         .         .        V.
------------------------------------------------------------------------------
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    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1325.0
             10%                             335.0
             20%                             220.0
             30%                             170.0
             40%                             130.0
             50%                             100.0
             60%                              75.0
             70%                              45.0
             80%                              30.0
             90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    105.00 TO NODE    104.00 IS CODE = 5.2
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   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2422.00
DOWNSTREAM ELEVATION(FT) = 2421.00
CHANNEL LENGTH(FT) = 50.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.73
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.03
CHANNEL NORMAL VELOCITY FOR Q = 432.03 CFS = 19.29 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.919

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.57	2.55	2.55
0.167	12.62	12.54	12.54
0.250	24.20	24.10	24.10
0.333	31.03	30.98	30.98
0.417	38.64	38.58	38.58
0.500	48.73	48.65	48.65
0.583	58.89	58.81	58.81
0.667	66.83	66.77	66.77
0.750	74.73	74.67	74.67
0.833	83.00	82.93	82.93
0.917	87.63	87.60	87.60
1.000	92.06	92.03	92.03
1.083	101.06	100.99	100.99
1.167	114.36	114.26	114.26
1.250	127.51	127.40	127.40
1.333	137.19	137.11	137.11
1.417	145.46	145.39	145.39
1.500	158.63	158.52	158.52
1.583	174.11	173.99	173.99
1.667	185.21	185.12	185.12
1.750	197.84	197.74	197.74
1.833	216.95	216.80	216.80
1.917	234.03	233.89	233.89
2.000	244.86	244.78	244.78
2.083	258.26	258.15	258.15
2.167	283.97	283.77	283.77
2.250	323.98	323.66	323.66
2.333	364.78	364.46	364.46
2.417	396.81	396.55	396.55
2.500	450.09	449.67	449.67
2.583	525.80	525.19	525.19

2.667	590.19	589.68	589.68
2.750	607.73	607.59	607.59
2.833	567.97	568.29	568.29
2.917	521.10	521.48	521.48
3.000	494.26	494.47	494.47
3.083	468.63	468.83	468.83
3.167	440.27	440.49	440.49
3.250	417.12	417.30	417.30
3.333	398.97	399.12	399.12
3.417	382.98	383.11	383.11
3.500	367.43	367.55	367.55
3.583	352.68	352.80	352.80
3.667	338.38	338.49	338.49
3.750	323.91	324.03	324.03
3.833	307.47	307.60	307.60
3.917	288.94	289.09	289.09
4.000	270.76	270.90	270.90
4.083	253.57	253.71	253.71
4.167	237.28	237.41	237.41
4.250	221.56	221.69	221.69
4.333	206.53	206.65	206.65
4.417	192.10	192.22	192.22
4.500	176.78	176.90	176.90
4.583	159.48	159.62	159.62
4.667	143.29	143.42	143.42
4.750	132.23	132.32	132.32
4.833	125.57	125.62	125.62
4.917	120.30	120.34	120.34
5.000	115.29	115.33	115.33
5.083	110.43	110.47	110.47
5.167	105.70	105.73	105.73
5.250	101.07	101.11	101.11
5.333	96.58	96.62	96.62
5.417	92.25	92.29	92.29
5.500	88.10	88.13	88.13
5.583	84.12	84.15	84.15
5.667	80.31	80.34	80.34
5.750	76.67	76.70	76.70
5.833	73.20	73.23	73.23
5.917	69.88	69.91	69.91
6.000	66.72	66.74	66.74
6.083	63.70	63.72	63.72
6.167	60.81	60.83	60.83
6.250	58.05	58.08	58.08
6.333	55.42	55.45	55.45
6.417	52.91	52.93	52.93
6.500	50.52	50.54	50.54
6.583	48.23	48.25	48.25
6.667	46.04	46.06	46.06
6.750	43.96	43.97	43.97
6.833	41.97	41.98	41.98
6.917	40.07	40.08	40.08
7.000	38.25	38.26	38.26
7.083	36.52	36.53	36.53
7.167	34.86	34.88	34.88
7.250	33.28	33.30	33.30
7.333	31.78	31.79	31.79
7.417	30.34	30.35	30.35
7.500	28.96	28.97	28.97
7.583	27.65	27.66	27.66
7.667	26.40	26.41	26.41
7.750	25.20	25.21	25.21
7.833	24.06	24.07	24.07

7.917	22.97	22.98	22.98
8.000	21.93	21.94	21.94
8.083	20.94	20.94	20.94
8.167	19.99	20.00	20.00
8.250	19.08	19.09	19.09
8.333	18.22	18.22	18.22
8.417	17.39	17.40	17.40
8.500	16.60	16.61	16.61
8.583	15.85	15.86	15.86
8.667	15.13	15.14	15.14
8.750	14.45	14.45	14.45
8.833	13.79	13.80	13.80
8.917	13.17	13.17	13.17
9.000	12.57	12.58	12.58
9.083	12.00	12.01	12.01
9.167	11.46	11.46	11.46
9.250	10.94	10.94	10.94
9.333	10.44	10.45	10.45
9.417	9.97	9.97	9.97
9.500	9.52	9.52	9.52
9.583	9.09	9.09	9.09
9.667	8.68	8.68	8.68
9.750	8.28	8.29	8.29
9.833	7.91	7.91	7.91
9.917	7.55	7.55	7.55
10.000	7.21	7.21	7.21
10.083	6.88	6.88	6.88
10.167	6.57	6.57	6.57
10.250	6.27	6.27	6.27
10.333	5.99	5.99	5.99
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.21	5.21
10.667	4.97	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.53	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.13	4.13	4.13
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.43	3.43	3.43
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.85	2.85
11.750	2.72	2.72	2.72
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.79	1.79	1.79
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30

13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.89	0.90	0.90
13.833	0.85	0.85	0.85
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62
14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07

18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03
19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.03	0.03	0.03
20.083	0.03	0.03	0.03
20.167	0.03	0.03	0.03
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02
20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.02	0.02	0.02
21.000	0.02	0.02	0.02
21.083	0.02	0.02	0.02
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01

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==============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


******************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    995.00 IS CODE = 5.2
------------------------------------------------------------------------------
  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
==============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).
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ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2421.00
DOWNSTREAM ELEVATION(FT) = 2417.00
CHANNEL LENGTH(FT) = 60.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.59
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.02
CHANNEL NORMAL VELOCITY FOR Q = 432.02 CFS = 30.06 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.946

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.55	2.53	2.53
0.167	12.54	12.47	12.47
0.250	24.10	24.03	24.03
0.333	30.98	30.93	30.93
0.417	38.58	38.53	38.53
0.500	48.65	48.59	48.59
0.583	58.81	58.74	58.74
0.667	66.77	66.72	66.72
0.750	74.67	74.62	74.62
0.833	82.93	82.88	82.88
0.917	87.60	87.57	87.57
1.000	92.03	92.00	92.00
1.083	100.99	100.94	100.94
1.167	114.26	114.17	114.17
1.250	127.40	127.32	127.32
1.333	137.11	137.05	137.05
1.417	145.39	145.34	145.34
1.500	158.52	158.44	158.44
1.583	173.99	173.89	173.89
1.667	185.12	185.05	185.05
1.750	197.74	197.66	197.66
1.833	216.80	216.68	216.68
1.917	233.89	233.78	233.78
2.000	244.78	244.71	244.71
2.083	258.15	258.07	258.07
2.167	283.77	283.61	283.61
2.250	323.66	323.41	323.41
2.333	364.46	364.20	364.20
2.417	396.55	396.35	396.35
2.500	449.67	449.34	449.34
2.583	525.19	524.72	524.72
2.667	589.68	589.27	589.27
2.750	607.59	607.48	607.48
2.833	568.29	568.53	568.53
2.917	521.48	521.77	521.77
3.000	494.47	494.64	494.64
3.083	468.83	469.00	469.00
3.167	440.49	440.67	440.67
3.250	417.30	417.45	417.45

3.333	399.12	399.23	399.23
3.417	383.11	383.21	383.21
3.500	367.55	367.65	367.65
3.583	352.80	352.89	352.89
3.667	338.49	338.58	338.58
3.750	324.03	324.12	324.12
3.833	307.60	307.70	307.70
3.917	289.09	289.21	289.21
4.000	270.90	271.01	271.01
4.083	253.71	253.81	253.81
4.167	237.41	237.51	237.51
4.250	221.69	221.78	221.78
4.333	206.65	206.75	206.75
4.417	192.22	192.31	192.31
4.500	176.90	177.00	177.00
4.583	159.62	159.73	159.73
4.667	143.42	143.52	143.52
4.750	132.32	132.39	132.39
4.833	125.62	125.67	125.67
4.917	120.34	120.37	120.37
5.000	115.33	115.36	115.36
5.083	110.47	110.50	110.50
5.167	105.73	105.76	105.76
5.250	101.11	101.14	101.14
5.333	96.62	96.65	96.65
5.417	92.29	92.32	92.32
5.500	88.13	88.16	88.16
5.583	84.15	84.18	84.18
5.667	80.34	80.37	80.37
5.750	76.70	76.72	76.72
5.833	73.23	73.25	73.25
5.917	69.91	69.93	69.93
6.000	66.74	66.76	66.76
6.083	63.72	63.74	63.74
6.167	60.83	60.85	60.85
6.250	58.08	58.09	58.09
6.333	55.45	55.46	55.46
6.417	52.93	52.95	52.95
6.500	50.54	50.55	50.55
6.583	48.25	48.26	48.26
6.667	46.06	46.07	46.07
6.750	43.97	43.99	43.99
6.833	41.98	41.99	41.99
6.917	40.08	40.09	40.09
7.000	38.26	38.28	38.28
7.083	36.53	36.54	36.54
7.167	34.88	34.89	34.89
7.250	33.30	33.31	33.31
7.333	31.79	31.80	31.80
7.417	30.35	30.36	30.36
7.500	28.97	28.98	28.98
7.583	27.66	27.67	27.67
7.667	26.41	26.42	26.42
7.750	25.21	25.22	25.22
7.833	24.07	24.08	24.08
7.917	22.98	22.99	22.99
8.000	21.94	21.94	21.94
8.083	20.94	20.95	20.95
8.167	20.00	20.00	20.00
8.250	19.09	19.09	19.09
8.333	18.22	18.23	18.23
8.417	17.40	17.40	17.40
8.500	16.61	16.62	16.62

8.583	15.86	15.86	15.86
8.667	15.14	15.14	15.14
8.750	14.45	14.46	14.46
8.833	13.80	13.80	13.80
8.917	13.17	13.18	13.18
9.000	12.58	12.58	12.58
9.083	12.01	12.01	12.01
9.167	11.46	11.47	11.47
9.250	10.94	10.95	10.95
9.333	10.45	10.45	10.45
9.417	9.97	9.98	9.98
9.500	9.52	9.53	9.53
9.583	9.09	9.09	9.09
9.667	8.68	8.68	8.68
9.750	8.29	8.29	8.29
9.833	7.91	7.91	7.91
9.917	7.55	7.56	7.56
10.000	7.21	7.21	7.21
10.083	6.88	6.89	6.89
10.167	6.57	6.57	6.57
10.250	6.27	6.28	6.28
10.333	5.99	5.99	5.99
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.21	5.21
10.667	4.98	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.54	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.13	4.14	4.14
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.43	3.44	3.44
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.85	2.85
11.750	2.72	2.72	2.72
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.79	1.80	1.80
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30
13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.90	0.90	0.90

13.833	0.85	0.85	0.85
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62
14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05

19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03
19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.03	0.03	0.03
20.083	0.03	0.03	0.03
20.167	0.03	0.03	0.03
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02
20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.02	0.02	0.02
21.000	0.02	0.02	0.02
21.083	0.02	0.02	0.02
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01

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  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    995.00 TO NODE    994.00 IS CODE = 5.2
----------------------------------------------------------------------------
  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    6.00     CHANNEL Z =  0.00
           UPSTREAM ELEVATION(FT) =    2417.00
           DOWNSTREAM ELEVATION(FT) =    2415.00
           CHANNEL LENGTH(FT) =      83.00     MANNING'S FACTOR = 0.015
           CONSTANT LOSS RATE(CFS) =    0.00
```

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.48
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.01
CHANNEL NORMAL VELOCITY FOR Q = 432.01 CFS = 21.02 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.925

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.53	2.50	2.50
0.167	12.47	12.35	12.35
0.250	24.03	23.89	23.89
0.333	30.93	30.85	30.85
0.417	38.53	38.44	38.44
0.500	48.59	48.47	48.47
0.583	58.74	58.62	58.62
0.667	66.72	66.62	66.62
0.750	74.62	74.53	74.53
0.833	82.88	82.78	82.78
0.917	87.57	87.51	87.51
1.000	92.00	91.95	91.95
1.083	100.94	100.83	100.83
1.167	114.17	114.01	114.01
1.250	127.32	127.16	127.16
1.333	137.05	136.93	136.93
1.417	145.34	145.24	145.24
1.500	158.44	158.28	158.28
1.583	173.89	173.70	173.70
1.667	185.05	184.92	184.92
1.750	197.66	197.51	197.51
1.833	216.68	216.45	216.45
1.917	233.78	233.58	233.58
2.000	244.71	244.58	244.58
2.083	258.07	257.90	257.90
2.167	283.61	283.30	283.30
2.250	323.41	322.92	322.92
2.333	364.20	363.70	363.70
2.417	396.35	395.96	395.96
2.500	449.34	448.69	448.69
2.583	524.72	523.80	523.80
2.667	589.27	588.48	588.48
2.750	607.48	607.26	607.26
2.833	568.53	569.01	569.01
2.917	521.77	522.34	522.34
3.000	494.64	494.97	494.97
3.083	469.00	469.31	469.31
3.167	440.67	441.01	441.01
3.250	417.45	417.73	417.73
3.333	399.23	399.45	399.45
3.417	383.21	383.41	383.41
3.500	367.65	367.84	367.84
3.583	352.89	353.07	353.07
3.667	338.58	338.75	338.75
3.750	324.12	324.29	324.29
3.833	307.70	307.90	307.90
3.917	289.21	289.43	289.43

4.000	271.01	271.24	271.24
4.083	253.81	254.02	254.02
4.167	237.51	237.71	237.71
4.250	221.78	221.98	221.98
4.333	206.75	206.93	206.93
4.417	192.31	192.48	192.48
4.500	177.00	177.19	177.19
4.583	159.73	159.94	159.94
4.667	143.52	143.72	143.72
4.750	132.39	132.53	132.53
4.833	125.67	125.75	125.75
4.917	120.37	120.44	120.44
5.000	115.36	115.43	115.43
5.083	110.50	110.56	110.56
5.167	105.76	105.82	105.82
5.250	101.14	101.19	101.19
5.333	96.65	96.70	96.70
5.417	92.32	92.37	92.37
5.500	88.16	88.21	88.21
5.583	84.18	84.22	84.22
5.667	80.37	80.41	80.41
5.750	76.72	76.77	76.77
5.833	73.25	73.29	73.29
5.917	69.93	69.97	69.97
6.000	66.76	66.80	66.80
6.083	63.74	63.78	63.78
6.167	60.85	60.89	60.89
6.250	58.09	58.13	58.13
6.333	55.46	55.49	55.49
6.417	52.95	52.98	52.98
6.500	50.55	50.58	50.58
6.583	48.26	48.29	48.29
6.667	46.07	46.10	46.10
6.750	43.99	44.01	44.01
6.833	41.99	42.02	42.02
6.917	40.09	40.12	40.12
7.000	38.28	38.30	38.30
7.083	36.54	36.56	36.56
7.167	34.89	34.91	34.91
7.250	33.31	33.33	33.33
7.333	31.80	31.82	31.82
7.417	30.36	30.37	30.37
7.500	28.98	29.00	29.00
7.583	27.67	27.68	27.68
7.667	26.42	26.43	26.43
7.750	25.22	25.23	25.23
7.833	24.08	24.09	24.09
7.917	22.99	23.00	23.00
8.000	21.94	21.96	21.96
8.083	20.95	20.96	20.96
8.167	20.00	20.01	20.01
8.250	19.09	19.11	19.11
8.333	18.23	18.24	18.24
8.417	17.40	17.41	17.41
8.500	16.62	16.63	16.63
8.583	15.86	15.87	15.87
8.667	15.14	15.15	15.15
8.750	14.46	14.47	14.47
8.833	13.80	13.81	13.81
8.917	13.18	13.19	13.19
9.000	12.58	12.59	12.59
9.083	12.01	12.02	12.02
9.167	11.47	11.47	11.47

9.250	10.95	10.95	10.95
9.333	10.45	10.46	10.46
9.417	9.98	9.98	9.98
9.500	9.53	9.53	9.53
9.583	9.09	9.10	9.10
9.667	8.68	8.69	8.69
9.750	8.29	8.29	8.29
9.833	7.91	7.92	7.92
9.917	7.56	7.56	7.56
10.000	7.21	7.22	7.22
10.083	6.89	6.89	6.89
10.167	6.57	6.58	6.58
10.250	6.28	6.28	6.28
10.333	5.99	6.00	6.00
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.22	5.22
10.667	4.98	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.54	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.14	4.14	4.14
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.44	3.44	3.44
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.86	2.86
11.750	2.72	2.73	2.73
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.80	1.80	1.80
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30
13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.90	0.90	0.90
13.833	0.85	0.86	0.86
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62

14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03

19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.03	0.03	0.03
20.083	0.03	0.03	0.03
20.167	0.03	0.03	0.03
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02
20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.02	0.02	0.02
21.000	0.02	0.02	0.02
21.083	0.02	0.02	0.02
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01

```
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    994.00 TO NODE    994.00 IS CODE =   8
----------------------------------------------------------------------------
  >>>>>MODEL STREAM SPLITFLOW WHERE A CONSTANT PROPORTION
       OF STREAM 1 IS ADDED TO STREAM 2<<<<<
============================================================================


                        INFLOW             INFLOW
                      (STREAM 2)        (STREAM 1)
                           |                   |
                           |                   |
                           |  (.100)(STREAM 1) |
                           |<------------------* <= splitflow model
                           |                   |
                           |                   |
                           |                   |
                           V                   V
                        STREAM 2           (.900)(STREAM 1)
                    + (.100)(STREAM 1)



        STREAM NUMBER 1 IS SPLIT TOWARDS STREAM 2
        WHERE 0.90(DECIMAL PERCENT) REMAINS IN STREAM 1
        AND 0.10(DECIMAL PERCENT) IS ADDED TO STREAM 2
```

STREAM SPLITFLOW MODELING RESULTS:

MODEL TIME (HRS)	INFLOW STREAM 2 (CFS)	INFLOW STREAM 1 (CFS)	OUTFLOW STREAM 2 (CFS)	OUTFLOW STREAM 1 (CFS)
0.083	0.00	2.50	0.25	2.25
0.167	0.00	12.35	1.24	11.12
0.250	0.00	23.89	2.39	21.50
0.333	0.00	30.85	3.08	27.76
0.417	0.00	38.44	3.84	34.60
0.500	0.00	48.47	4.85	43.62
0.583	0.00	58.62	5.86	52.76
0.667	0.00	66.62	6.66	59.96
0.750	0.00	74.53	7.45	67.07
0.833	0.00	82.78	8.28	74.50
0.917	0.00	87.51	8.75	78.76
1.000	0.00	91.95	9.19	82.75
1.083	0.00	100.83	10.08	90.75
1.167	0.00	114.01	11.40	102.61
1.250	0.00	127.16	12.72	114.44
1.333	0.00	136.93	13.69	123.24
1.417	0.00	145.24	14.52	130.71
1.500	0.00	158.28	15.83	142.45
1.583	0.00	173.70	17.37	156.33
1.667	0.00	184.92	18.49	166.42
1.750	0.00	197.51	19.75	177.76
1.833	0.00	216.45	21.64	194.80
1.917	0.00	233.58	23.36	210.22
2.000	0.00	244.58	24.46	220.12
2.083	0.00	257.90	25.79	232.11
2.167	0.00	283.30	28.33	254.97
2.250	0.00	322.92	32.29	290.63
2.333	0.00	363.70	36.37	327.33
2.417	0.00	395.96	39.60	356.36
2.500	0.00	448.69	44.87	403.82
2.583	0.00	523.80	52.38	471.42
2.667	0.00	588.48	58.85	529.64
2.750	0.00	607.26	60.73	546.53
2.833	0.00	569.01	56.90	512.11
2.917	0.00	522.34	52.23	470.11
3.000	0.00	494.97	49.50	445.47
3.083	0.00	469.31	46.93	422.38
3.167	0.00	441.01	44.10	396.91
3.250	0.00	417.73	41.77	375.96
3.333	0.00	399.45	39.95	359.51
3.417	0.00	383.41	38.34	345.06
3.500	0.00	367.84	36.78	331.06
3.583	0.00	353.07	35.31	317.76
3.667	0.00	338.75	33.88	304.88
3.750	0.00	324.29	32.43	291.86
3.833	0.00	307.90	30.79	277.11
3.917	0.00	289.43	28.94	260.49
4.000	0.00	271.24	27.12	244.11
4.083	0.00	254.02	25.40	228.62
4.167	0.00	237.71	23.77	213.94
4.250	0.00	221.98	22.20	199.78
4.333	0.00	206.93	20.69	186.24
4.417	0.00	192.48	19.25	173.24
4.500	0.00	177.19	17.72	159.47
4.583	0.00	159.94	15.99	143.94
4.667	0.00	143.72	14.37	129.35
4.750	0.00	132.53	13.25	119.27

4.833	0.00	125.75	12.57	113.17
4.917	0.00	120.44	12.04	108.39
5.000	0.00	115.43	11.54	103.88
5.083	0.00	110.56	11.06	99.51
5.167	0.00	105.82	10.58	95.24
5.250	0.00	101.19	10.12	91.07
5.333	0.00	96.70	9.67	87.03
5.417	0.00	92.37	9.24	83.13
5.500	0.00	88.21	8.82	79.39
5.583	0.00	84.22	8.42	75.80
5.667	0.00	80.41	8.04	72.37
5.750	0.00	76.77	7.68	69.09
5.833	0.00	73.29	7.33	65.96
5.917	0.00	69.97	7.00	62.97
6.000	0.00	66.80	6.68	60.12
6.083	0.00	63.78	6.38	57.40
6.167	0.00	60.89	6.09	54.80
6.250	0.00	58.13	5.81	52.31
6.333	0.00	55.49	5.55	49.94
6.417	0.00	52.98	5.30	47.68
6.500	0.00	50.58	5.06	45.52
6.583	0.00	48.29	4.83	43.46
6.667	0.00	46.10	4.61	41.49
6.750	0.00	44.01	4.40	39.61
6.833	0.00	42.02	4.20	37.82
6.917	0.00	40.12	4.01	36.10
7.000	0.00	38.30	3.83	34.47
7.083	0.00	36.56	3.66	32.91
7.167	0.00	34.91	3.49	31.42
7.250	0.00	33.33	3.33	29.99
7.333	0.00	31.82	3.18	28.63
7.417	0.00	30.37	3.04	27.34
7.500	0.00	29.00	2.90	26.10
7.583	0.00	27.68	2.77	24.92
7.667	0.00	26.43	2.64	23.79
7.750	0.00	25.23	2.52	22.71
7.833	0.00	24.09	2.41	21.68
7.917	0.00	23.00	2.30	20.70
8.000	0.00	21.96	2.20	19.76
8.083	0.00	20.96	2.10	18.87
8.167	0.00	20.01	2.00	18.01
8.250	0.00	19.11	1.91	17.20
8.333	0.00	18.24	1.82	16.42
8.417	0.00	17.41	1.74	15.67
8.500	0.00	16.63	1.66	14.96
8.583	0.00	15.87	1.59	14.28
8.667	0.00	15.15	1.52	13.64
8.750	0.00	14.47	1.45	13.02
8.833	0.00	13.81	1.38	12.43
8.917	0.00	13.19	1.32	11.87
9.000	0.00	12.59	1.26	11.33
9.083	0.00	12.02	1.20	10.82
9.167	0.00	11.47	1.15	10.33
9.250	0.00	10.95	1.10	9.86
9.333	0.00	10.46	1.05	9.41
9.417	0.00	9.98	1.00	8.99
9.500	0.00	9.53	0.95	8.58
9.583	0.00	9.10	0.91	8.19
9.667	0.00	8.69	0.87	7.82
9.750	0.00	8.29	0.83	7.46
9.833	0.00	7.92	0.79	7.13
9.917	0.00	7.56	0.76	6.80
10.000	0.00	7.22	0.72	6.50

10.083	0.00	6.89	0.69	6.20
10.167	0.00	6.58	0.66	5.92
10.250	0.00	6.28	0.63	5.65
10.333	0.00	6.00	0.60	5.40
10.417	0.00	5.72	0.57	5.15
10.500	0.00	5.46	0.55	4.92
10.583	0.00	5.22	0.52	4.70
10.667	0.00	4.98	0.50	4.48
10.750	0.00	4.75	0.48	4.28
10.833	0.00	4.54	0.45	4.09
10.917	0.00	4.33	0.43	3.90
11.000	0.00	4.14	0.41	3.72
11.083	0.00	3.95	0.40	3.56
11.167	0.00	3.77	0.38	3.39
11.250	0.00	3.60	0.36	3.24
11.333	0.00	3.44	0.34	3.09
11.417	0.00	3.28	0.33	2.95
11.500	0.00	3.13	0.31	2.82
11.583	0.00	2.99	0.30	2.69
11.667	0.00	2.86	0.29	2.57
11.750	0.00	2.73	0.27	2.45
11.833	0.00	2.60	0.26	2.34
11.917	0.00	2.48	0.25	2.24
12.000	0.00	2.37	0.24	2.13
12.083	0.00	2.26	0.23	2.04
12.167	0.00	2.16	0.22	1.95
12.250	0.00	2.06	0.21	1.86
12.333	0.00	1.97	0.20	1.77
12.417	0.00	1.88	0.19	1.69
12.500	0.00	1.80	0.18	1.62
12.583	0.00	1.71	0.17	1.54
12.667	0.00	1.64	0.16	1.47
12.750	0.00	1.56	0.16	1.41
12.833	0.00	1.49	0.15	1.34
12.917	0.00	1.42	0.14	1.28
13.000	0.00	1.36	0.14	1.22
13.083	0.00	1.30	0.13	1.17
13.167	0.00	1.24	0.12	1.12
13.250	0.00	1.18	0.12	1.07
13.333	0.00	1.13	0.11	1.02
13.417	0.00	1.08	0.11	0.97
13.500	0.00	1.03	0.10	0.93
13.583	0.00	0.98	0.10	0.88
13.667	0.00	0.94	0.09	0.84
13.750	0.00	0.90	0.09	0.81
13.833	0.00	0.86	0.09	0.77
13.917	0.00	0.82	0.08	0.74
14.000	0.00	0.78	0.08	0.70
14.083	0.00	0.74	0.07	0.67
14.167	0.00	0.71	0.07	0.64
14.250	0.00	0.68	0.07	0.61
14.333	0.00	0.65	0.06	0.58
14.417	0.00	0.62	0.06	0.56
14.500	0.00	0.59	0.06	0.53
14.583	0.00	0.56	0.06	0.51
14.667	0.00	0.54	0.05	0.48
14.750	0.00	0.51	0.05	0.46
14.833	0.00	0.49	0.05	0.44
14.917	0.00	0.47	0.05	0.42
15.000	0.00	0.45	0.04	0.40
15.083	0.00	0.43	0.04	0.38
15.167	0.00	0.41	0.04	0.37
15.250	0.00	0.39	0.04	0.35

15.333	0.00	0.37	0.04	0.33
15.417	0.00	0.35	0.04	0.32
15.500	0.00	0.34	0.03	0.30
15.583	0.00	0.32	0.03	0.29
15.667	0.00	0.31	0.03	0.28
15.750	0.00	0.29	0.03	0.27
15.833	0.00	0.28	0.03	0.25
15.917	0.00	0.27	0.03	0.24
16.000	0.00	0.26	0.03	0.23
16.083	0.00	0.24	0.02	0.22
16.167	0.00	0.23	0.02	0.21
16.250	0.00	0.22	0.02	0.20
16.333	0.00	0.21	0.02	0.19
16.417	0.00	0.20	0.02	0.18
16.500	0.00	0.19	0.02	0.17
16.583	0.00	0.19	0.02	0.17
16.667	0.00	0.18	0.02	0.16
16.750	0.00	0.17	0.02	0.15
16.833	0.00	0.16	0.02	0.15
16.917	0.00	0.15	0.02	0.14
17.000	0.00	0.15	0.01	0.13
17.083	0.00	0.14	0.01	0.13
17.167	0.00	0.13	0.01	0.12
17.250	0.00	0.13	0.01	0.12
17.333	0.00	0.12	0.01	0.11
17.417	0.00	0.12	0.01	0.10
17.500	0.00	0.11	0.01	0.10
17.583	0.00	0.11	0.01	0.10
17.667	0.00	0.10	0.01	0.09
17.750	0.00	0.10	0.01	0.09
17.833	0.00	0.09	0.01	0.08
17.917	0.00	0.09	0.01	0.08
18.000	0.00	0.08	0.01	0.08
18.083	0.00	0.08	0.01	0.07
18.167	0.00	0.08	0.01	0.07
18.250	0.00	0.07	0.01	0.07
18.333	0.00	0.07	0.01	0.06
18.417	0.00	0.07	0.01	0.06
18.500	0.00	0.06	0.01	0.06
18.583	0.00	0.06	0.01	0.05
18.667	0.00	0.06	0.01	0.05
18.750	0.00	0.06	0.01	0.05
18.833	0.00	0.05	0.01	0.05
18.917	0.00	0.05	0.01	0.05
19.000	0.00	0.05	0.00	0.04
19.083	0.00	0.05	0.00	0.04
19.167	0.00	0.04	0.00	0.04
19.250	0.00	0.04	0.00	0.04
19.333	0.00	0.04	0.00	0.04
19.417	0.00	0.04	0.00	0.03
19.500	0.00	0.04	0.00	0.03
19.583	0.00	0.03	0.00	0.03
19.667	0.00	0.03	0.00	0.03
19.750	0.00	0.03	0.00	0.03
19.833	0.00	0.03	0.00	0.03
19.917	0.00	0.03	0.00	0.03
20.000	0.00	0.03	0.00	0.02

****

FLOW PROCESS FROM NODE   994.00 TO NODE   994.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

```
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      150.0     300.0     450.0     600.0
----------------------------------------------------------------------------
   0.083      0.0155      2.25  Q         .         .         .         .
   0.167      0.0921     11.12  Q         .         .         .         .
   0.250      0.2401     21.50  VQ        .         .         .         .
   0.333      0.4313     27.76  VQ        .         .         .         .
   0.417      0.6696     34.60  V Q       .         .         .         .
   0.500      0.9700     43.62  V Q       .         .         .         .
   0.583      1.3334     52.76  V  Q      .         .         .         .
   0.667      1.7463     59.96  V  Q      .         .         .         .
   0.750      2.2082     67.07  V   Q     .         .         .         .
   0.833      2.7213     74.50  .V  Q     .         .         .         .
   0.917      3.2638     78.76  .V   Q    .         .         .         .
   1.000      3.8337     82.75  .V   Q    .         .         .         .
   1.083      4.4586     90.75  .V    Q   .         .         .         .
   1.167      5.1653    102.61  .V    Q   .         .         .         .
   1.250      5.9535    114.44  . V    Q  .         .         .         .
   1.333      6.8022    123.24  . V     Q .         .         .         .
   1.417      7.7025    130.71  . V     Q .         .         .         .
   1.500      8.6836    142.45  .  V     Q.         .         .         .
   1.583      9.7602    156.33  .  V      Q         .         .         .
   1.667     10.9064    166.42  .   V     .Q        .         .         .
   1.750     12.1306    177.76  .   V     .Q        .         .         .
   1.833     13.4723    194.80  .    V    . Q       .         .         .
   1.917     14.9200    210.22  .    V    .   Q     .         .         .
   2.000     16.4360    220.12  .     V   .   Q     .         .         .
   2.083     18.0346    232.11  .     V   .    Q    .         .         .
   2.167     19.7906    254.97  .      V  .     Q   .         .         .
   2.250     21.7922    290.63  .       V .        Q.         .         .
   2.333     24.0465    327.33  .        V.         .Q        .         .
   2.417     26.5008    356.36  .         V         .  Q      .         .
   2.500     29.2819    403.82  .         .V        .     Q   .         .
   2.583     32.5286    471.42  .         . V       .         .Q        .
   2.667     36.1763    529.64  .         .  V      .         .     Q   .
   2.750     39.9403    546.53  .         .    V    .         .      Q  .
   2.833     43.4672    512.11  .         .     V   .         .    Q    .
   2.917     46.7048    470.11  .         .      V  .         .Q        .
   3.000     49.7728    445.47  .         .       V .        Q.         .
   3.083     52.6817    422.38  .         .         V       Q .         .
   3.167     55.4153    396.91  .         .         .V    Q   .         .
   3.250     58.0045    375.96  .         .         . V  Q    .         .
   3.333     60.4805    359.51  .         .         .  Q      .         .
   3.417     62.8570    345.06  .         .         .  Q      .         .
   3.500     65.1370    331.06  .         .         . Q V     .         .
   3.583     67.3254    317.76  .         .         .Q   V    .         .
   3.667     69.4252    304.88  .         .         Q     V   .         .
   3.750     71.4352    291.86  .         .        Q.      V  .         .
   3.833     73.3437    277.11  .         .       Q .      V  .         .
   3.917     75.1377    260.49  .         .      Q  .       V .         .
   4.000     76.8190    244.11  .         .     Q   .        V.         .
   4.083     78.3935    228.62  .         .    Q    .        V.         .
   4.167     79.8669    213.94  .         .   Q     .         V         .
   4.250     81.2428    199.78  .         .  Q      .         V         .
   4.333     82.5254    186.24  .         . Q       .         .V        .
   4.417     83.7185    173.24  .         .Q        .         .V        .
   4.500     84.8167    159.47  .         Q         .         . V       .
   4.583     85.8081    143.94  .        Q.         .         . V       .
   4.667     86.6989    129.35  .       Q .         .         .  V      .
```

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4.750     87.5203    119.27  .      Q  .         .         .  V      .
4.833     88.2998    113.17  .      Q  .         .         .  V      .
4.917     89.0463    108.39  .      Q  .         .         .  V      .
5.000     89.7617    103.88  .     Q   .         .         .   V     .
5.083     90.4470     99.51  .     Q   .         .         .   V     .
5.167     91.1030     95.24  .     Q   .         .         .   V     .
5.250     91.7302     91.07  .     Q   .         .         .   V     .
5.333     92.3296     87.03  .    Q    .         .         .    V    .
5.417     92.9021     83.13  .    Q    .         .         .    V    .
5.500     93.4489     79.39  .    Q    .         .         .    V    .
5.583     93.9709     75.80  .    Q    .         .         .    V    .
5.667     94.4693     72.37  .   Q     .         .         .    V    .
5.750     94.9452     69.09  .   Q     .         .         .     V   .
5.833     95.3995     65.96  .   Q     .         .         .     V   .
5.917     95.8332     62.97  .   Q     .         .         .     V   .
6.000     96.2472     60.12  .   Q     .         .         .     V   .
6.083     96.6425     57.40  .  Q      .         .         .     V   .
6.167     97.0199     54.80  .  Q      .         .         .     V   .
6.250     97.3802     52.31  .  Q      .         .         .      V  .
6.333     97.7242     49.94  .  Q      .         .         .      V  .
6.417     98.0526     47.68  .  Q      .         .         .      V  .
6.500     98.3661     45.52  .  Q      .         .         .      V  .
6.583     98.6654     43.46  . Q       .         .         .      V  .
6.667     98.9512     41.49  . Q       .         .         .      V  .
6.750     99.2240     39.61  . Q       .         .         .      V  .
6.833     99.4844     37.82  . Q       .         .         .      V  .
6.917     99.7331     36.10  . Q       .         .         .       V .
7.000     99.9705     34.47  . Q       .         .         .       V .
7.083    100.1971     32.91  . Q       .         .         .       V .
7.167    100.4134     31.42  . Q       .         .         .       V .
7.250    100.6200     29.99  .Q        .         .         .       V .
7.333    100.8172     28.63  .Q        .         .         .       V .
7.417    101.0055     27.34  .Q        .         .         .       V .
7.500    101.1852     26.10  .Q        .         .         .       V .
7.583    101.3568     24.92  .Q        .         .         .       V .
7.667    101.5207     23.79  .Q        .         .         .       V .
7.750    101.6771     22.71  .Q        .         .         .       V .
7.833    101.8264     21.68  .Q        .         .         .       V .
7.917    101.9689     20.70  .Q        .         .         .       V .
8.000    102.1050     19.76  .Q        .         .         .       V .
8.083    102.2349     18.87  .Q        .         .         .       V .
8.167    102.3590     18.01  .Q        .         .         .        V.
8.250    102.4774     17.20  .Q        .         .         .        V.
8.333    102.5905     16.42  .Q        .         .         .        V.
8.417    102.6984     15.67  .Q        .         .         .        V.
8.500    102.8015     14.96  Q         .         .         .        V.
8.583    102.8998     14.28  Q         .         .         .        V.
8.667    102.9938     13.64  Q         .         .         .        V.
8.750    103.0834     13.02  Q         .         .         .        V.
8.833    103.1691     12.43  Q         .         .         .        V.
8.917    103.2508     11.87  Q         .         .         .        V.
9.000    103.3288     11.33  Q         .         .         .        V.
9.083    103.4033     10.82  Q         .         .         .        V.
9.167    103.4744     10.33  Q         .         .         .        V.
9.250    103.5423      9.86  Q         .         .         .        V.
9.333    103.6071      9.41  Q         .         .         .        V.
9.417    103.6690      8.99  Q         .         .         .        V.
9.500    103.7281      8.58  Q         .         .         .        V.
9.583    103.7845      8.19  Q         .         .         .        V.
9.667    103.8383      7.82  Q         .         .         .        V.
9.750    103.8897      7.46  Q         .         .         .        V.
9.833    103.9388      7.13  Q         .         .         .        V.
9.917    103.9857      6.80  Q         .         .         .        V.
```

10.000	104.0304	6.50	Q	.	.	.	V.
10.083	104.0731	6.20	Q	.	.	.	V.
10.167	104.1139	5.92	Q	.	.	.	V.
10.250	104.1528	5.65	Q	.	.	.	V.
10.333	104.1900	5.40	Q	.	.	.	V.
10.417	104.2255	5.15	Q	.	.	.	V.
10.500	104.2593	4.92	Q	.	.	.	V.
10.583	104.2917	4.70	Q	.	.	.	V.
10.667	104.3225	4.48	Q	.	.	.	V.
10.750	104.3520	4.28	Q	.	.	.	V.
10.833	104.3801	4.09	Q	.	.	.	V.
10.917	104.4070	3.90	Q	.	.	.	V.
11.000	104.4327	3.72	Q	.	.	.	V.
11.083	104.4571	3.56	Q	.	.	.	V.
11.167	104.4805	3.39	Q	.	.	.	V.
11.250	104.5028	3.24	Q	.	.	.	V.
11.333	104.5241	3.09	Q	.	.	.	V.
11.417	104.5445	2.95	Q	.	.	.	V.
11.500	104.5639	2.82	Q	.	.	.	V.
11.583	104.5824	2.69	Q	.	.	.	V.
11.667	104.6001	2.57	Q	.	.	.	V.
11.750	104.6170	2.45	Q	.	.	.	V.
11.833	104.6332	2.34	Q	.	.	.	V.
11.917	104.6486	2.24	Q	.	.	.	V.
12.000	104.6633	2.13	Q	.	.	.	V.
12.083	104.6773	2.04	Q	.	.	.	V.
12.167	104.6907	1.95	Q	.	.	.	V.
12.250	104.7035	1.86	Q	.	.	.	V.
12.333	104.7157	1.77	Q	.	.	.	V.
12.417	104.7274	1.69	Q	.	.	.	V.
12.500	104.7385	1.62	Q	.	.	.	V.
12.583	104.7491	1.54	Q	.	.	.	V.
12.667	104.7593	1.47	Q	.	.	.	V.
12.750	104.7690	1.41	Q	.	.	.	V.
12.833	104.7782	1.34	Q	.	.	.	V.
12.917	104.7871	1.28	Q	.	.	.	V.
13.000	104.7955	1.22	Q	.	.	.	V.
13.083	104.8035	1.17	Q	.	.	.	V.
13.167	104.8112	1.12	Q	.	.	.	V.
13.250	104.8186	1.07	Q	.	.	.	V.
13.333	104.8256	1.02	Q	.	.	.	V.
13.417	104.8322	0.97	Q	.	.	.	V.
13.500	104.8386	0.93	Q	.	.	.	V.
13.583	104.8447	0.88	Q	.	.	.	V.
13.667	104.8505	0.84	Q	.	.	.	V.
13.750	104.8561	0.81	Q	.	.	.	V.
13.833	104.8614	0.77	Q	.	.	.	V.
13.917	104.8665	0.74	Q	.	.	.	V.
14.000	104.8713	0.70	Q	.	.	.	V.
14.083	104.8759	0.67	Q	.	.	.	V.
14.167	104.8803	0.64	Q	.	.	.	V.
14.250	104.8845	0.61	Q	.	.	.	V.
14.333	104.8885	0.58	Q	.	.	.	V.
14.417	104.8924	0.56	Q	.	.	.	V.
14.500	104.8960	0.53	Q	.	.	.	V.
14.583	104.8995	0.51	Q	.	.	.	V.
14.667	104.9028	0.48	Q	.	.	.	V.
14.750	104.9060	0.46	Q	.	.	.	V.
14.833	104.9091	0.44	Q	.	.	.	V.
14.917	104.9120	0.42	Q	.	.	.	V.
15.000	104.9147	0.40	Q	.	.	.	V.
15.083	104.9174	0.38	Q	.	.	.	V.
15.167	104.9199	0.37	Q	.	.	.	V.

15.250	104.9223	0.35	Q	.	.	.	V.
15.333	104.9246	0.33	Q	.	.	.	V.
15.417	104.9268	0.32	Q	.	.	.	V.
15.500	104.9289	0.30	Q	.	.	.	V.
15.583	104.9309	0.29	Q	.	.	.	V.
15.667	104.9328	0.28	Q	.	.	.	V.
15.750	104.9347	0.27	Q	.	.	.	V.
15.833	104.9364	0.25	Q	.	.	.	V.
15.917	104.9381	0.24	Q	.	.	.	V.
16.000	104.9397	0.23	Q	.	.	.	V.
16.083	104.9412	0.22	Q	.	.	.	V.
16.167	104.9426	0.21	Q	.	.	.	V.
16.250	104.9440	0.20	Q	.	.	.	V.
16.333	104.9453	0.19	Q	.	.	.	V.
16.417	104.9466	0.18	Q	.	.	.	V.
16.500	104.9478	0.17	Q	.	.	.	V.
16.583	104.9489	0.17	Q	.	.	.	V.
16.667	104.9500	0.16	Q	.	.	.	V.
16.750	104.9511	0.15	Q	.	.	.	V.
16.833	104.9521	0.15	Q	.	.	.	V.
16.917	104.9530	0.14	Q	.	.	.	V.
17.000	104.9539	0.13	Q	.	.	.	V.
17.083	104.9548	0.13	Q	.	.	.	V.
17.167	104.9556	0.12	Q	.	.	.	V.
17.250	104.9564	0.12	Q	.	.	.	V.
17.333	104.9572	0.11	Q	.	.	.	V.
17.417	104.9579	0.10	Q	.	.	.	V.
17.500	104.9586	0.10	Q	.	.	.	V.
17.583	104.9593	0.10	Q	.	.	.	V.
17.667	104.9599	0.09	Q	.	.	.	V.
17.750	104.9605	0.09	Q	.	.	.	V.
17.833	104.9611	0.08	Q	.	.	.	V.
17.917	104.9616	0.08	Q	.	.	.	V.
18.000	104.9621	0.08	Q	.	.	.	V.
18.083	104.9626	0.07	Q	.	.	.	V.
18.167	104.9631	0.07	Q	.	.	.	V.
18.250	104.9636	0.07	Q	.	.	.	V.
18.333	104.9640	0.06	Q	.	.	.	V.
18.417	104.9644	0.06	Q	.	.	.	V.
18.500	104.9648	0.06	Q	.	.	.	V.
18.583	104.9652	0.05	Q	.	.	.	V.
18.667	104.9655	0.05	Q	.	.	.	V.
18.750	104.9659	0.05	Q	.	.	.	V.
18.833	104.9662	0.05	Q	.	.	.	V.
18.917	104.9665	0.05	Q	.	.	.	V.
19.000	104.9668	0.04	Q	.	.	.	V.
19.083	104.9671	0.04	Q	.	.	.	V.
19.167	104.9674	0.04	Q	.	.	.	V.
19.250	104.9676	0.04	Q	.	.	.	V.
19.333	104.9679	0.04	Q	.	.	.	V.
19.417	104.9681	0.03	Q	.	.	.	V.
19.500	104.9683	0.03	Q	.	.	.	V.
19.583	104.9686	0.03	Q	.	.	.	V.
19.667	104.9688	0.03	Q	.	.	.	V.
19.750	104.9690	0.03	Q	.	.	.	V.
19.833	104.9692	0.03	Q	.	.	.	V.
19.917	104.9693	0.03	Q	.	.	.	V.
20.000	104.9695	0.02	Q	.	.	.	V.
20.083	104.9697	0.02	Q	.	.	.	V.
20.167	104.9698	0.02	Q	.	.	.	V.
20.250	104.9700	0.02	Q	.	.	.	V.
20.333	104.9701	0.02	Q	.	.	.	V.
20.417	104.9703	0.02	Q	.	.	.	V.

```
  20.500    104.9704      0.02  Q         .         .         .        V.
  20.583    104.9705      0.02  Q         .         .         .        V.
  20.667    104.9706      0.02  Q         .         .         .        V.
  20.750    104.9707      0.02  Q         .         .         .        V.
  20.833    104.9709      0.02  Q         .         .         .        V.
  20.917    104.9710      0.01  Q         .         .         .        V.
  21.000    104.9711      0.01  Q         .         .         .        V.
  21.083    104.9712      0.01  Q         .         .         .        V.
  21.167    104.9712      0.01  Q         .         .         .        V.
  21.250    104.9713      0.01  Q         .         .         .        V.
  21.333    104.9714      0.01  Q         .         .         .        V.
  21.417    104.9715      0.01  Q         .         .         .        V.
  21.500    104.9716      0.01  Q         .         .         .        V.
  21.583    104.9716      0.01  Q         .         .         .        V.
  21.667    104.9717      0.01  Q         .         .         .        V.
  21.750    104.9718      0.01  Q         .         .         .        V.
  21.833    104.9718      0.01  Q         .         .         .        V.
  21.917    104.9719      0.01  Q         .         .         .        V.
  22.000    104.9719      0.01  Q         .         .         .        V.
  22.083    104.9720      0.01  Q         .         .         .        V.
  22.167    104.9720      0.01  Q         .         .         .        V.
  22.250    104.9721      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1335.0
             10%                             335.0
             20%                             220.0
             30%                             170.0
             40%                             130.0
             50%                             100.0
             60%                              70.0
             70%                              45.0
             80%                              30.0
             90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    994.00 TO NODE    994.00 IS CODE =  11
 ----------------------------------------------------------------------------
   >>>>>VIEW STREAM NUMBER 2 HYDROGRAPH<<<<<
 ============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
 ----------------------------------------------------------------------------
  TIME(HRS) VOLUME(AF)   Q(CFS) 0.       17.5      35.0      52.5      70.0
 ----------------------------------------------------------------------------
    0.083      0.0017      0.25  Q         .         .         .         .
    0.167      0.0102      1.24  Q         .         .         .         .
    0.250      0.0267      2.39  VQ        .         .         .         .
    0.333      0.0479      3.08  VQ        .         .         .         .
    0.417      0.0744      3.84  V Q       .         .         .         .
    0.500      0.1078      4.85  V Q       .         .         .         .
    0.583      0.1482      5.86  V  Q      .         .         .         .
    0.667      0.1940      6.66  V  Q      .         .         .         .
    0.750      0.2454      7.45  V   Q     .         .         .         .
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0.833      0.3024      8.28  .V  Q     .         .         .         .
0.917      0.3626      8.75  .V   Q    .         .         .         .
1.000      0.4260      9.19  .V   Q    .         .         .         .
1.083      0.4954     10.08  .V   Q    .         .         .         .
1.167      0.5739     11.40  .V    Q   .         .         .         .
1.250      0.6615     12.72  . V    Q  .         .         .         .
1.333      0.7558     13.69  . V    Q  .         .         .         .
1.417      0.8558     14.52  . V     Q .         .         .         .
1.500      0.9648     15.83  .  V     Q.         .         .         .
1.583      1.0845     17.37  .  V     Q.         .         .         .
1.667      1.2118     18.49  .   V     Q         .         .         .
1.750      1.3478     19.75  .   V     .Q        .         .         .
1.833      1.4969     21.64  .    V    . Q       .         .         .
1.917      1.6578     23.36  .    V    .  Q      .         .         .
2.000      1.8262     24.46  .     V   .  Q      .         .         .
2.083      2.0038     25.79  .     V   .   Q     .         .         .
2.167      2.1990     28.33  .      V  .     Q   .         .         .
2.250      2.4213     32.29  .       V .       Q .         .         .
2.333      2.6718     36.37  .        V.         Q         .         .
2.417      2.9445     39.60  .         V         . Q       .         .
2.500      3.2535     44.87  .         .V        .    Q    .         .
2.583      3.6143     52.38  .         . V       .        Q.         .
2.667      4.0196     58.85  .         .  V      .         .  Q      .
2.750      4.4378     60.73  .         .    V    .         .   Q     .
2.833      4.8297     56.90  .         .     V   .         . Q       .
2.917      5.1894     52.23  .         .      V  .        Q.         .
3.000      5.5303     49.50  .         .       V .       Q .         .
3.083      5.8535     46.93  .         .         V     Q   .         .
3.167      6.1573     44.10  .         .         .V   Q    .         .
3.250      6.4449     41.77  .         .         . VQ      .         .
3.333      6.7201     39.95  .         .         . QV      .         .
3.417      6.9841     38.34  .         .         .Q V      .         .
3.500      7.2374     36.78  .         .         .Q  V     .         .
3.583      7.4806     35.31  .         .         Q    V    .         .
3.667      7.7139     33.88  .         .        Q.     V   .         .
3.750      7.9372     32.43  .         .       Q .      V  .         .
3.833      8.1493     30.79  .         .      Q  .      V  .         .
3.917      8.3486     28.94  .         .     Q   .       V .         .
4.000      8.5354     27.12  .         .    Q    .        V.         .
4.083      8.7104     25.40  .         .   Q     .        V.         .
4.167      8.8741     23.77  .         .  Q      .         V         .
4.250      9.0270     22.20  .         . Q       .         V         .
4.333      9.1695     20.69  .         .Q        .         .V        .
4.417      9.3021     19.25  .         Q         .         .V        .
4.500      9.4241     17.72  .         Q         .         . V       .
4.583      9.5342     15.99  .        Q.         .         . V       .
4.667      9.6332     14.37  .       Q .         .         .  V      .
4.750      9.7245     13.25  .      Q  .         .         .  V      .
4.833      9.8111     12.57  .      Q  .         .         .  V      .
4.917      9.8940     12.04  .     Q   .         .         .  V      .
5.000      9.9735     11.54  .     Q   .         .         .   V     .
5.083     10.0497     11.06  .     Q   .         .         .   V     .
5.167     10.1226     10.58  .     Q   .         .         .   V     .
5.250     10.1922     10.12  .    Q    .         .         .   V     .
5.333     10.2588      9.67  .    Q    .         .         .    V    .
5.417     10.3225      9.24  .    Q    .         .         .    V    .
5.500     10.3832      8.82  .    Q    .         .         .    V    .
5.583     10.4412      8.42  .   Q     .         .         .    V    .
5.667     10.4966      8.04  .   Q     .         .         .    V    .
5.750     10.5495      7.68  .   Q     .         .         .     V   .
5.833     10.5999      7.33  .   Q     .         .         .     V   .
5.917     10.6481      7.00  .  Q      .         .         .     V   .
6.000     10.6941      6.68  .  Q      .         .         .     V   .
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 6.083     10.7381      6.38  .  Q      .         .         .     V   .
 6.167     10.7800      6.09  .  Q      .         .         .     V   .
 6.250     10.8200      5.81  .  Q      .         .         .      V  .
 6.333     10.8582      5.55  .  Q      .         .         .      V  .
 6.417     10.8947      5.30  .  Q      .         .         .      V  .
 6.500     10.9296      5.06  . Q       .         .         .      V  .
 6.583     10.9628      4.83  . Q       .         .         .      V  .
 6.667     10.9946      4.61  . Q       .         .         .      V  .
 6.750     11.0249      4.40  . Q       .         .         .      V  .
 6.833     11.0538      4.20  . Q       .         .         .      V  .
 6.917     11.0814      4.01  . Q       .         .         .       V .
 7.000     11.1078      3.83  . Q       .         .         .       V .
 7.083     11.1330      3.66  . Q       .         .         .       V .
 7.167     11.1570      3.49  .Q        .         .         .       V .
 7.250     11.1800      3.33  .Q        .         .         .       V .
 7.333     11.2019      3.18  .Q        .         .         .       V .
 7.417     11.2228      3.04  .Q        .         .         .       V .
 7.500     11.2428      2.90  .Q        .         .         .       V .
 7.583     11.2619      2.77  .Q        .         .         .       V .
 7.667     11.2801      2.64  .Q        .         .         .       V .
 7.750     11.2974      2.52  .Q        .         .         .       V .
 7.833     11.3140      2.41  .Q        .         .         .       V .
 7.917     11.3299      2.30  .Q        .         .         .       V .
 8.000     11.3450      2.20  .Q        .         .         .       V .
 8.083     11.3594      2.10  .Q        .         .         .       V .
 8.167     11.3732      2.00  .Q        .         .         .        V.
 8.250     11.3864      1.91  .Q        .         .         .        V.
 8.333     11.3989      1.82  .Q        .         .         .        V.
 8.417     11.4109      1.74  Q         .         .         .        V.
 8.500     11.4224      1.66  Q         .         .         .        V.
 8.583     11.4333      1.59  Q         .         .         .        V.
 8.667     11.4437      1.52  Q         .         .         .        V.
 8.750     11.4537      1.45  Q         .         .         .        V.
 8.833     11.4632      1.38  Q         .         .         .        V.
 8.917     11.4723      1.32  Q         .         .         .        V.
 9.000     11.4810      1.26  Q         .         .         .        V.
 9.083     11.4893      1.20  Q         .         .         .        V.
 9.167     11.4972      1.15  Q         .         .         .        V.
 9.250     11.5047      1.10  Q         .         .         .        V.
 9.333     11.5119      1.05  Q         .         .         .        V.
 9.417     11.5188      1.00  Q         .         .         .        V.
 9.500     11.5253      0.95  Q         .         .         .        V.
 9.583     11.5316      0.91  Q         .         .         .        V.
 9.667     11.5376      0.87  Q         .         .         .        V.
 9.750     11.5433      0.83  Q         .         .         .        V.
 9.833     11.5488      0.79  Q         .         .         .        V.
 9.917     11.5540      0.76  Q         .         .         .        V.
10.000     11.5589      0.72  Q         .         .         .        V.
10.083     11.5637      0.69  Q         .         .         .        V.
10.167     11.5682      0.66  Q         .         .         .        V.
10.250     11.5725      0.63  Q         .         .         .        V.
10.333     11.5767      0.60  Q         .         .         .        V.
10.417     11.5806      0.57  Q         .         .         .        V.
10.500     11.5844      0.55  Q         .         .         .        V.
10.583     11.5880      0.52  Q         .         .         .        V.
10.667     11.5914      0.50  Q         .         .         .        V.
10.750     11.5947      0.48  Q         .         .         .        V.
10.833     11.5978      0.45  Q         .         .         .        V.
10.917     11.6008      0.43  Q         .         .         .        V.
11.000     11.6036      0.41  Q         .         .         .        V.
11.083     11.6063      0.40  Q         .         .         .        V.
11.167     11.6089      0.38  Q         .         .         .        V.
11.250     11.6114      0.36  Q         .         .         .        V.
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11.333	11.6138	0.34	Q	.	.	.	V.
11.417	11.6160	0.33	Q	.	.	.	V.
11.500	11.6182	0.31	Q	.	.	.	V.
11.583	11.6203	0.30	Q	.	.	.	V.
11.667	11.6222	0.29	Q	.	.	.	V.
11.750	11.6241	0.27	Q	.	.	.	V.
11.833	11.6259	0.26	Q	.	.	.	V.
11.917	11.6276	0.25	Q	.	.	.	V.
12.000	11.6292	0.24	Q	.	.	.	V.
12.083	11.6308	0.23	Q	.	.	.	V.
12.167	11.6323	0.22	Q	.	.	.	V.
12.250	11.6337	0.21	Q	.	.	.	V.
12.333	11.6351	0.20	Q	.	.	.	V.
12.417	11.6364	0.19	Q	.	.	.	V.
12.500	11.6376	0.18	Q	.	.	.	V.
12.583	11.6388	0.17	Q	.	.	.	V.
12.667	11.6399	0.16	Q	.	.	.	V.
12.750	11.6410	0.16	Q	.	.	.	V.
12.833	11.6420	0.15	Q	.	.	.	V.
12.917	11.6430	0.14	Q	.	.	.	V.
13.000	11.6439	0.14	Q	.	.	.	V.
13.083	11.6448	0.13	Q	.	.	.	V.
13.167	11.6457	0.12	Q	.	.	.	V.
13.250	11.6465	0.12	Q	.	.	.	V.
13.333	11.6473	0.11	Q	.	.	.	V.
13.417	11.6480	0.11	Q	.	.	.	V.
13.500	11.6487	0.10	Q	.	.	.	V.
13.583	11.6494	0.10	Q	.	.	.	V.
13.667	11.6501	0.09	Q	.	.	.	V.
13.750	11.6507	0.09	Q	.	.	.	V.
13.833	11.6513	0.09	Q	.	.	.	V.
13.917	11.6518	0.08	Q	.	.	.	V.
14.000	11.6524	0.08	Q	.	.	.	V.
14.083	11.6529	0.07	Q	.	.	.	V.
14.167	11.6534	0.07	Q	.	.	.	V.
14.250	11.6538	0.07	Q	.	.	.	V.
14.333	11.6543	0.06	Q	.	.	.	V.
14.417	11.6547	0.06	Q	.	.	.	V.
14.500	11.6551	0.06	Q	.	.	.	V.
14.583	11.6555	0.06	Q	.	.	.	V.
14.667	11.6559	0.05	Q	.	.	.	V.
14.750	11.6562	0.05	Q	.	.	.	V.
14.833	11.6566	0.05	Q	.	.	.	V.
14.917	11.6569	0.05	Q	.	.	.	V.
15.000	11.6572	0.04	Q	.	.	.	V.
15.083	11.6575	0.04	Q	.	.	.	V.
15.167	11.6578	0.04	Q	.	.	.	V.
15.250	11.6580	0.04	Q	.	.	.	V.
15.333	11.6583	0.04	Q	.	.	.	V.
15.417	11.6585	0.04	Q	.	.	.	V.
15.500	11.6588	0.03	Q	.	.	.	V.
15.583	11.6590	0.03	Q	.	.	.	V.
15.667	11.6592	0.03	Q	.	.	.	V.
15.750	11.6594	0.03	Q	.	.	.	V.
15.833	11.6596	0.03	Q	.	.	.	V.
15.917	11.6598	0.03	Q	.	.	.	V.
16.000	11.6600	0.03	Q	.	.	.	V.
16.083	11.6601	0.02	Q	.	.	.	V.
16.167	11.6603	0.02	Q	.	.	.	V.
16.250	11.6604	0.02	Q	.	.	.	V.
16.333	11.6606	0.02	Q	.	.	.	V.
16.417	11.6607	0.02	Q	.	.	.	V.
16.500	11.6609	0.02	Q	.	.	.	V.

```
  16.583     11.6610      0.02  Q         .         .         .        V.
  16.667     11.6611      0.02  Q         .         .         .        V.
  16.750     11.6612      0.02  Q         .         .         .        V.
  16.833     11.6613      0.02  Q         .         .         .        V.
  16.917     11.6614      0.02  Q         .         .         .        V.
  17.000     11.6615      0.01  Q         .         .         .        V.
  17.083     11.6616      0.01  Q         .         .         .        V.
  17.167     11.6617      0.01  Q         .         .         .        V.
  17.250     11.6618      0.01  Q         .         .         .        V.
  17.333     11.6619      0.01  Q         .         .         .        V.
  17.417     11.6620      0.01  Q         .         .         .        V.
  17.500     11.6621      0.01  Q         .         .         .        V.
  17.583     11.6621      0.01  Q         .         .         .        V.
  17.667     11.6622      0.01  Q         .         .         .        V.
  17.750     11.6623      0.01  Q         .         .         .        V.
  17.833     11.6623      0.01  Q         .         .         .        V.
  17.917     11.6624      0.01  Q         .         .         .        V.
  18.000     11.6625      0.01  Q         .         .         .        V.
  18.083     11.6625      0.01  Q         .         .         .        V.
  18.167     11.6626      0.01  Q         .         .         .        V.
  18.250     11.6626      0.01  Q         .         .         .        V.
  18.333     11.6627      0.01  Q         .         .         .        V.
  18.417     11.6627      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                 Duration
        Peak Flow Rate                      (minutes)
    =======================                 =========
               0%                            1105.0
              10%                             335.0
              20%                             220.0
              30%                             170.0
              40%                             130.0
              50%                             100.0
              60%                              70.0
              70%                              45.0
              80%                              30.0
              90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    994.00 TO NODE    993.00 IS CODE = 5.2
 ----------------------------------------------------------------------------
   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
 ============================================================================

          THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
          TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
          INTERVALS(Reference: the National Engineering Handbook,
          Hydrology, Chapter 17, page 17-52, August,1972,
          U.S. Department of Commerce).


          ASSUMED REGULAR CHANNEL INFORMATION:
            BASEWIDTH(FT) =    6.00     CHANNEL Z =  0.00
            UPSTREAM ELEVATION(FT) =    2415.00
            DOWNSTREAM ELEVATION(FT) =    2412.00
            CHANNEL LENGTH(FT) =      97.00     MANNING'S FACTOR = 0.015
            CONSTANT LOSS RATE(CFS) =    0.00
```

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 546.53
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 388.80
CHANNEL NORMAL VELOCITY FOR Q = 388.80 CFS = 22.53 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.930

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.25	2.22	2.22
0.167	11.12	11.00	11.00
0.250	21.50	21.36	21.36
0.333	27.76	27.68	27.68
0.417	34.60	34.51	34.51
0.500	43.62	43.50	43.50
0.583	52.76	52.63	52.63
0.667	59.96	59.86	59.86
0.750	67.07	66.98	66.98
0.833	74.50	74.40	74.40
0.917	78.76	78.70	78.70
1.000	82.75	82.70	82.70
1.083	90.75	90.64	90.64
1.167	102.61	102.45	102.45
1.250	114.44	114.29	114.29
1.333	123.24	123.12	123.12
1.417	130.71	130.62	130.62
1.500	142.45	142.30	142.30
1.583	156.33	156.15	156.15
1.667	166.42	166.29	166.29
1.750	177.76	177.61	177.61
1.833	194.80	194.57	194.57
1.917	210.22	210.01	210.01
2.000	220.12	219.99	219.99
2.083	232.11	231.95	231.95
2.167	254.97	254.66	254.66
2.250	290.63	290.15	290.15
2.333	327.33	326.84	326.84
2.417	356.36	355.98	355.98
2.500	403.82	403.19	403.19
2.583	471.42	470.52	470.52
2.667	529.64	528.86	528.86
2.750	546.53	546.30	546.30
2.833	512.11	512.57	512.57
2.917	470.11	470.67	470.67
3.000	445.47	445.80	445.80
3.083	422.38	422.68	422.68
3.167	396.91	397.25	397.25
3.250	375.96	376.24	376.24
3.333	359.51	359.73	359.73
3.417	345.06	345.26	345.26
3.500	331.06	331.24	331.24
3.583	317.76	317.94	317.94
3.667	304.88	305.05	305.05
3.750	291.86	292.04	292.04
3.833	277.11	277.31	277.31

3.917	260.49	260.71	260.71
4.000	244.11	244.33	244.33
4.083	228.62	228.83	228.83
4.167	213.94	214.13	214.13
4.250	199.78	199.97	199.97
4.333	186.24	186.42	186.42
4.417	173.24	173.41	173.41
4.500	159.47	159.65	159.65
4.583	143.94	144.15	144.15
4.667	129.35	129.54	129.54
4.750	119.27	119.41	119.41
4.833	113.17	113.25	113.25
4.917	108.39	108.46	108.46
5.000	103.88	103.94	103.94
5.083	99.51	99.57	99.57
5.167	95.24	95.30	95.30
5.250	91.07	91.13	91.13
5.333	87.03	87.08	87.08
5.417	83.13	83.18	83.18
5.500	79.39	79.44	79.44
5.583	75.80	75.85	75.85
5.667	72.37	72.42	72.42
5.750	69.09	69.14	69.14
5.833	65.96	66.00	66.00
5.917	62.97	63.01	63.01
6.000	60.12	60.16	60.16
6.083	57.40	57.43	57.43
6.167	54.80	54.83	54.83
6.250	52.31	52.35	52.35
6.333	49.94	49.98	49.98
6.417	47.68	47.71	47.71
6.500	45.52	45.55	45.55
6.583	43.46	43.49	43.49
6.667	41.49	41.52	41.52
6.750	39.61	39.64	39.64
6.833	37.82	37.84	37.84
6.917	36.10	36.13	36.13
7.000	34.47	34.49	34.49
7.083	32.91	32.93	32.93
7.167	31.42	31.44	31.44
7.250	29.99	30.01	30.01
7.333	28.63	28.65	28.65
7.417	27.34	27.35	27.35
7.500	26.10	26.12	26.12
7.583	24.92	24.93	24.93
7.667	23.79	23.80	23.80
7.750	22.71	22.72	22.72
7.833	21.68	21.69	21.69
7.917	20.70	20.71	20.71
8.000	19.76	19.77	19.77
8.083	18.87	18.88	18.88
8.167	18.01	18.02	18.02
8.250	17.20	17.21	17.21
8.333	16.42	16.43	16.43
8.417	15.67	15.68	15.68
8.500	14.96	14.97	14.97
8.583	14.28	14.29	14.29
8.667	13.64	13.65	13.65
8.750	13.02	13.03	13.03
8.833	12.43	12.44	12.44
8.917	11.87	11.87	11.87
9.000	11.33	11.34	11.34
9.083	10.82	10.82	10.82

9.167	10.33	10.33	10.33
9.250	9.86	9.86	9.86
9.333	9.41	9.42	9.42
9.417	8.99	8.99	8.99
9.500	8.58	8.58	8.58
9.583	8.19	8.19	8.19
9.667	7.82	7.82	7.82
9.750	7.46	7.47	7.47
9.833	7.13	7.13	7.13
9.917	6.80	6.81	6.81
10.000	6.50	6.50	6.50
10.083	6.20	6.20	6.20
10.167	5.92	5.92	5.92
10.250	5.65	5.66	5.66
10.333	5.40	5.40	5.40
10.417	5.15	5.15	5.15
10.500	4.92	4.92	4.92
10.583	4.70	4.70	4.70
10.667	4.48	4.49	4.49
10.750	4.28	4.28	4.28
10.833	4.09	4.09	4.09
10.917	3.90	3.90	3.90
11.000	3.72	3.73	3.73
11.083	3.56	3.56	3.56
11.167	3.39	3.40	3.40
11.250	3.24	3.24	3.24
11.333	3.09	3.10	3.10
11.417	2.95	2.96	2.96
11.500	2.82	2.82	2.82
11.583	2.69	2.69	2.69
11.667	2.57	2.57	2.57
11.750	2.45	2.46	2.46
11.833	2.34	2.34	2.34
11.917	2.24	2.24	2.24
12.000	2.13	2.14	2.14
12.083	2.04	2.04	2.04
12.167	1.95	1.95	1.95
12.250	1.86	1.86	1.86
12.333	1.77	1.77	1.77
12.417	1.69	1.69	1.69
12.500	1.62	1.62	1.62
12.583	1.54	1.54	1.54
12.667	1.47	1.47	1.47
12.750	1.41	1.41	1.41
12.833	1.34	1.34	1.34
12.917	1.28	1.28	1.28
13.000	1.22	1.22	1.22
13.083	1.17	1.17	1.17
13.167	1.12	1.12	1.12
13.250	1.07	1.07	1.07
13.333	1.02	1.02	1.02
13.417	0.97	0.97	0.97
13.500	0.93	0.93	0.93
13.583	0.88	0.89	0.89
13.667	0.84	0.85	0.85
13.750	0.81	0.81	0.81
13.833	0.77	0.77	0.77
13.917	0.74	0.74	0.74
14.000	0.70	0.70	0.70
14.083	0.67	0.67	0.67
14.167	0.64	0.64	0.64
14.250	0.61	0.61	0.61
14.333	0.58	0.58	0.58

14.417	0.56	0.56	0.56
14.500	0.53	0.53	0.53
14.583	0.51	0.51	0.51
14.667	0.48	0.48	0.48
14.750	0.46	0.46	0.46
14.833	0.44	0.44	0.44
14.917	0.42	0.42	0.42
15.000	0.40	0.40	0.40
15.083	0.38	0.38	0.38
15.167	0.37	0.37	0.37
15.250	0.35	0.35	0.35
15.333	0.33	0.33	0.33
15.417	0.32	0.32	0.32
15.500	0.30	0.30	0.30
15.583	0.29	0.29	0.29
15.667	0.28	0.28	0.28
15.750	0.27	0.27	0.27
15.833	0.25	0.25	0.25
15.917	0.24	0.24	0.24
16.000	0.23	0.23	0.23
16.083	0.22	0.22	0.22
16.167	0.21	0.21	0.21
16.250	0.20	0.20	0.20
16.333	0.19	0.19	0.19
16.417	0.18	0.18	0.18
16.500	0.17	0.17	0.17
16.583	0.17	0.17	0.17
16.667	0.16	0.16	0.16
16.750	0.15	0.15	0.15
16.833	0.15	0.15	0.15
16.917	0.14	0.14	0.14
17.000	0.13	0.13	0.13
17.083	0.13	0.13	0.13
17.167	0.12	0.12	0.12
17.250	0.12	0.12	0.12
17.333	0.11	0.11	0.11
17.417	0.10	0.10	0.10
17.500	0.10	0.10	0.10
17.583	0.10	0.10	0.10
17.667	0.09	0.09	0.09
17.750	0.09	0.09	0.09
17.833	0.08	0.08	0.08
17.917	0.08	0.08	0.08
18.000	0.08	0.08	0.08
18.083	0.07	0.07	0.07
18.167	0.07	0.07	0.07
18.250	0.07	0.07	0.07
18.333	0.06	0.06	0.06
18.417	0.06	0.06	0.06
18.500	0.06	0.06	0.06
18.583	0.05	0.05	0.05
18.667	0.05	0.05	0.05
18.750	0.05	0.05	0.05
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.04	0.04	0.04
19.083	0.04	0.04	0.04
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.03	0.03	0.03
19.500	0.03	0.03	0.03
19.583	0.03	0.03	0.03

19.667	0.03	0.03	0.03
19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.02	0.02	0.02
20.083	0.02	0.02	0.02
20.167	0.02	0.02	0.02
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02
20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.01	0.01	0.01
21.000	0.01	0.01	0.01
21.083	0.01	0.01	0.01
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01
22.083	0.01	0.01	0.01
22.167	0.01	0.01	0.01
22.250	0.01	0.01	0.01
22.333	0.01	0.01	0.01
22.417	0.01	0.01	0.01
22.500	0.01	0.01	0.01
22.583	0.01	0.01	0.01
22.667	0.01	0.01	0.01
22.750	0.01	0.01	0.01
22.833	0.01	0.01	0.01
22.917	0.00	0.00	0.00
23.000	0.00	0.00	0.00
23.083	0.00	0.00	0.00
23.167	0.00	0.00	0.00
23.250	0.00	0.00	0.00
23.333	0.00	0.00	0.00
23.417	0.00	0.00	0.00
23.500	0.00	0.00	0.00
23.583	0.00	0.00	0.00
23.667	0.00	0.00	0.00
23.750	0.00	0.00	0.00
23.833	0.00	0.00	0.00
23.917	0.00	0.00	0.00
24.000	0.00	0.00	0.00

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============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    104.973 AF
    OUTFLOW VOLUME =    104.973 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    993.00 TO NODE    992.00 IS CODE =   4
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>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 1545.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 2412.00
DOWNSTREAM ELEVATION(FT) = 2379.00
PIPE DIAMETER(FT) = 6.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	2.22	0.82	0.00	0.000
0.167	11.00	4.05	0.00	0.000
0.250	21.36	7.86	15.36	0.000
0.333	27.68	10.18	30.68	0.000
0.417	34.51	11.66	33.27	0.000
0.500	43.50	12.36	40.61	0.000
0.583	52.63	13.07	51.55	0.000
0.667	59.86	13.63	58.68	0.000
0.750	66.98	14.10	65.12	0.000
0.833	74.40	14.54	72.53	0.000
0.917	78.70	14.80	77.67	0.000
1.000	82.70	15.04	81.77	0.000
1.083	90.64	15.52	88.87	0.000
1.167	102.45	16.09	99.75	0.000
1.250	114.29	16.64	111.69	0.000
1.333	123.12	17.04	121.29	0.000
1.417	130.62	17.33	128.99	0.000
1.500	142.30	17.76	139.85	0.000
1.583	156.15	18.26	153.38	0.000
1.667	166.29	18.61	164.30	0.000
1.750	177.61	18.99	175.47	0.000
1.833	194.57	19.47	191.26	0.000
1.917	210.01	19.82	206.91	0.000
2.000	219.99	20.04	218.04	0.000
2.083	231.95	20.32	229.70	0.000
2.167	254.66	20.81	250.43	0.000
2.250	290.15	21.48	283.61	0.000
2.333	326.84	22.20	320.58	0.000
2.417	355.98	22.66	350.90	0.000
2.500	403.19	23.22	394.66	0.000
2.583	470.52	24.04	459.15	0.000
2.667	528.86	24.54	518.67	0.000
2.750	546.30	24.66	543.22	0.000
2.833	512.57	24.42	518.57	0.000
2.917	470.67	24.04	477.92	0.000
3.000	445.80	23.78	450.07	0.000
3.083	422.68	23.49	426.59	0.000
3.167	397.25	23.15	401.54	0.000
3.250	376.24	22.93	380.10	0.000

3.333	359.73	22.71	362.67	0.000
3.417	345.26	22.51	347.83	0.000
3.500	331.24	22.28	333.67	0.000
3.583	317.94	22.04	320.23	0.000
3.667	305.05	21.80	307.27	0.000
3.750	292.04	21.52	294.23	0.000
3.833	277.31	21.21	279.87	0.000
3.917	260.71	20.92	263.85	0.000
4.000	244.33	20.61	247.46	0.000
4.083	228.83	20.25	231.68	0.000
4.167	214.13	19.91	216.94	0.000
4.250	199.97	19.59	202.79	0.000
4.333	186.42	19.28	189.20	0.000
4.417	173.41	18.85	175.82	0.000
4.500	159.65	18.38	162.30	0.000
4.583	144.15	17.82	147.23	0.000
4.667	129.54	17.29	132.60	0.000
4.750	119.41	16.87	121.56	0.000
4.833	113.25	16.59	114.54	0.000
4.917	108.46	16.37	109.49	0.000
5.000	103.94	16.16	104.94	0.000
5.083	99.57	15.96	100.56	0.000
5.167	95.30	15.77	96.29	0.000
5.250	91.13	15.55	92.08	0.000
5.333	87.08	15.31	87.97	0.000
5.417	83.18	15.07	84.06	0.000
5.500	79.44	14.85	80.31	0.000
5.583	75.85	14.63	76.71	0.000
5.667	72.42	14.42	73.26	0.000
5.750	69.14	14.23	69.97	0.000
5.833	66.00	14.04	66.82	0.000
5.917	63.01	13.86	63.81	0.000
6.000	60.16	13.66	60.89	0.000
6.083	57.43	13.44	58.12	0.000
6.167	54.83	13.24	55.51	0.000
6.250	52.35	13.05	53.01	0.000
6.333	49.98	12.86	50.63	0.000
6.417	47.71	12.69	48.35	0.000
6.500	45.55	12.52	46.18	0.000
6.583	43.49	12.36	44.10	0.000
6.667	41.52	12.21	42.12	0.000
6.750	39.64	12.06	40.23	0.000
6.833	37.84	11.92	38.42	0.000
6.917	36.13	11.79	36.69	0.000
7.000	34.49	11.66	35.04	0.000
7.083	32.93	11.54	33.46	0.000
7.167	31.44	11.42	31.96	0.000
7.250	30.01	11.04	30.18	0.000
7.333	28.65	10.54	28.65	0.000
7.417	27.35	10.06	27.35	0.000
7.500	26.12	9.61	26.12	0.000
7.583	24.93	9.17	24.93	0.000
7.667	23.80	8.76	23.80	0.000
7.750	22.72	8.36	22.72	0.000
7.833	21.69	7.98	21.69	0.000
7.917	20.71	7.62	20.71	0.000
8.000	19.77	7.27	19.77	0.000
8.083	18.88	6.94	18.88	0.000
8.167	18.02	6.63	18.02	0.000
8.250	17.21	6.33	17.21	0.000
8.333	16.43	6.04	16.43	0.000
8.417	15.68	5.77	15.68	0.000
8.500	14.97	5.51	14.97	0.000

8.583	14.29	5.26	14.29	0.000
8.667	13.65	5.02	14.00	0.000
8.750	13.03	4.79	13.29	0.000
8.833	12.44	4.57	12.41	0.000
8.917	11.87	4.37	11.85	0.000
9.000	11.34	4.17	11.31	0.000
9.083	10.82	3.98	10.80	0.000
9.167	10.33	3.80	10.31	0.000
9.250	9.86	3.63	9.84	0.000
9.333	9.42	3.46	9.40	0.000
9.417	8.99	3.31	8.97	0.000
9.500	8.58	3.16	8.56	0.000
9.583	8.19	3.01	8.18	0.000
9.667	7.82	2.88	7.81	0.000
9.750	7.47	2.75	7.45	0.000
9.833	7.13	2.62	7.11	0.000
9.917	6.81	2.50	6.79	0.000
10.000	6.50	2.39	6.87	0.000
10.083	6.20	2.28	6.42	0.000
10.167	5.92	2.18	5.88	0.000
10.250	5.66	2.08	5.62	0.000
10.333	5.40	1.99	5.36	0.000
10.417	5.15	1.90	5.12	0.000
10.500	4.92	1.81	4.89	0.000
10.583	4.70	1.73	4.67	0.000
10.667	4.49	1.65	4.45	0.000
10.750	4.28	1.58	4.25	0.000
10.833	4.09	1.50	4.60	0.000
10.917	3.90	1.44	3.94	0.000
11.000	3.73	1.37	3.67	0.000
11.083	3.56	1.31	3.51	0.000
11.167	3.40	1.25	3.35	0.000
11.250	3.24	1.19	3.20	0.000
11.333	3.10	1.14	3.05	0.000
11.417	2.96	1.09	3.33	0.000
11.500	2.82	1.04	2.98	0.000
11.583	2.69	0.99	2.63	0.000
11.667	2.57	0.95	2.51	0.000
11.750	2.46	0.90	2.39	0.000
11.833	2.34	0.86	2.29	0.000
11.917	2.24	0.82	2.72	0.000
12.000	2.14	0.79	2.16	0.000
12.083	2.04	0.75	1.96	0.000
12.167	1.95	0.72	1.87	0.000
12.250	1.86	0.68	1.79	0.000
12.333	1.77	0.65	2.28	0.000
12.417	1.69	0.62	1.66	0.000
12.500	1.62	0.59	1.53	0.000
12.583	1.54	0.57	1.46	0.000
12.667	1.47	0.54	1.76	0.000
12.750	1.41	0.52	1.58	0.000
12.833	1.34	0.50	1.24	0.000
12.917	1.28	0.50	1.19	0.000
13.000	1.22	0.50	1.58	0.000
13.083	1.17	0.50	1.25	0.000
13.167	1.12	0.50	1.00	0.000
13.250	1.07	0.50	1.06	0.000
13.333	1.02	0.50	1.44	0.000
13.417	0.97	0.50	0.84	0.000
13.500	0.93	0.50	0.81	0.000
13.583	0.89	0.50	1.33	0.000
13.667	0.85	0.50	0.94	0.000
13.750	0.81	0.50	1.30	0.000

13.833	0.77	0.50	1.24	0.000
13.917	0.74	0.50	1.19	0.000
14.000	0.70	0.50	1.13	0.000
14.083	0.67	0.50	1.08	0.000
14.167	0.64	0.50	1.03	0.000
14.250	0.61	0.50	0.99	0.000
14.333	0.58	0.50	0.94	0.000
14.417	0.56	0.50	0.90	0.000
14.500	0.53	0.50	0.86	0.000
14.583	0.51	0.50	0.82	0.000
14.667	0.48	0.50	0.78	0.000
14.750	0.46	0.50	0.75	0.000
14.833	0.44	0.50	0.71	0.000
14.917	0.42	0.50	0.68	0.000
15.000	0.40	0.50	0.65	0.000
15.083	0.38	0.50	0.62	0.000
15.167	0.37	0.50	0.59	0.000
15.250	0.35	0.50	0.56	0.000
15.333	0.33	0.50	0.54	0.000
15.417	0.32	0.50	0.51	0.000
15.500	0.30	0.50	0.49	0.000
15.583	0.29	0.50	0.47	0.000
15.667	0.28	0.50	0.45	0.000
15.750	0.27	0.50	0.43	0.000
15.833	0.25	0.50	0.41	0.000
15.917	0.24	0.50	0.39	0.000
16.000	0.23	0.50	0.37	0.000
16.083	0.22	0.50	0.36	0.000
16.167	0.21	0.50	0.34	0.000
16.250	0.20	0.50	0.32	0.000
16.333	0.19	0.50	0.31	0.000
16.417	0.18	0.50	0.30	0.000
16.500	0.17	0.50	0.28	0.000
16.583	0.17	0.50	0.27	0.000
16.667	0.16	0.50	0.26	0.000
16.750	0.15	0.50	0.25	0.000
16.833	0.15	0.50	0.23	0.000
16.917	0.14	0.50	0.22	0.000
17.000	0.13	0.50	0.21	0.000
17.083	0.13	0.50	0.20	0.000
17.167	0.12	0.50	0.19	0.000
17.250	0.12	0.50	0.19	0.000
17.333	0.11	0.50	0.18	0.000
17.417	0.10	0.50	0.17	0.000
17.500	0.10	0.50	0.16	0.000
17.583	0.10	0.50	0.15	0.000
17.667	0.09	0.50	0.15	0.000
17.750	0.09	0.50	0.14	0.000
17.833	0.08	0.50	0.13	0.000
17.917	0.08	0.50	0.13	0.000
18.000	0.08	0.50	0.12	0.000
18.083	0.07	0.50	0.12	0.000
18.167	0.07	0.50	0.11	0.000
18.250	0.07	0.50	0.11	0.000
18.333	0.06	0.50	0.10	0.000
18.417	0.06	0.50	0.10	0.000
18.500	0.06	0.50	0.09	0.000
18.583	0.05	0.50	0.09	0.000
18.667	0.05	0.50	0.08	0.000
18.750	0.05	0.50	0.08	0.000
18.833	0.05	0.50	0.08	0.000
18.917	0.05	0.50	0.07	0.000
19.000	0.04	0.50	0.07	0.000

19.083	0.04	0.50	0.07	0.000
19.167	0.04	0.50	0.06	0.000
19.250	0.04	0.50	0.06	0.000
19.333	0.04	0.50	0.06	0.000
19.417	0.03	0.50	0.06	0.000
19.500	0.03	0.50	0.05	0.000
19.583	0.03	0.50	0.05	0.000
19.667	0.03	0.50	0.05	0.000
19.750	0.03	0.50	0.05	0.000
19.833	0.03	0.50	0.04	0.000
19.917	0.03	0.50	0.04	0.000
20.000	0.02	0.50	0.04	0.000
20.083	0.02	0.50	0.04	0.000
20.167	0.02	0.50	0.04	0.000
20.250	0.02	0.50	0.03	0.000
20.333	0.02	0.50	0.03	0.000
20.417	0.02	0.50	0.03	0.000
20.500	0.02	0.50	0.03	0.000
20.583	0.02	0.50	0.03	0.000
20.667	0.02	0.50	0.03	0.000
20.750	0.02	0.50	0.03	0.000
20.833	0.02	0.50	0.03	0.000
20.917	0.01	0.50	0.02	0.000
21.000	0.01	0.50	0.02	0.000
21.083	0.01	0.50	0.02	0.000
21.167	0.01	0.50	0.02	0.000
21.250	0.01	0.50	0.02	0.000
21.333	0.01	0.50	0.02	0.000
21.417	0.01	0.50	0.02	0.000
21.500	0.01	0.50	0.02	0.000
21.583	0.01	0.50	0.02	0.000
21.667	0.01	0.50	0.02	0.000
21.750	0.01	0.50	0.02	0.000
21.833	0.01	0.50	0.01	0.000
21.917	0.01	0.50	0.01	0.000
22.000	0.01	0.50	0.01	0.000
22.083	0.01	0.50	0.01	0.000
22.167	0.01	0.50	0.01	0.000
22.250	0.01	0.50	0.01	0.000
22.333	0.01	0.50	0.01	0.000
22.417	0.01	0.50	0.01	0.000
22.500	0.01	0.50	0.01	0.000
22.583	0.01	0.50	0.01	0.000
22.667	0.01	0.50	0.01	0.000
22.750	0.01	0.50	0.01	0.000
22.833	0.01	0.50	0.01	0.000
22.917	0.00	0.50	0.01	0.000
23.000	0.00	0.50	0.01	0.000
23.083	0.00	0.50	0.01	0.000
23.167	0.00	0.50	0.01	0.000
23.250	0.00	0.50	0.01	0.000
23.333	0.00	0.50	0.01	0.000
23.417	0.00	0.50	0.01	0.000
23.500	0.00	0.50	0.01	0.000
23.583	0.00	0.50	0.01	0.000
23.667	0.00	0.50	0.01	0.000
23.750	0.00	0.50	0.00	0.000
23.833	0.00	0.50	0.00	0.000
23.917	0.00	0.50	0.00	0.000
24.000	0.00	0.50	0.00	0.000

****

```
 FLOW PROCESS FROM NODE    992.00 TO NODE    992.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

     (UNIT-HYDROGRAPH ADDED TO STREAM #1)

        WATERSHED AREA =      13.100 ACRES
        BASEFLOW =   0.000 CFS/SQUARE-MILE
        *USER ENTERED "LAG" TIME =    0.100 HOURS
         CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
         THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
         MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
        VALLEY S-GRAPH SELECTED
        UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.080
        LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
        USER-ENTERED RAINFALL =  2.25 INCHES
        RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
        RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH         UNIT HYDROGRAPH
     NUMBER          MEAN VALUES         ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                22.170
        2               59.664                72.355
        3               78.792                30.305
        4               86.766                12.632
        5               91.428                 7.386
        6               94.514                 4.890
        7               96.650                 3.383
        8               98.044                 2.209
        9               98.699                 1.037
       10               99.289                 0.935
       11               99.716                 0.676
       12               99.929                 0.338
       13              100.000                 0.113
```

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0066	0.0226
2	0.0292	0.0066	0.0226
3	0.0247	0.0066	0.0181
4	0.0337	0.0066	0.0271
5	0.0337	0.0066	0.0271
6	0.0405	0.0066	0.0339
7	0.0337	0.0066	0.0271
8	0.0405	0.0066	0.0339
9	0.0405	0.0066	0.0339
10	0.0337	0.0066	0.0271
11	0.0360	0.0066	0.0294
12	0.0405	0.0066	0.0339
13	0.0495	0.0066	0.0429
14	0.0495	0.0066	0.0429
15	0.0495	0.0066	0.0429
16	0.0450	0.0066	0.0384
17	0.0585	0.0066	0.0519
18	0.0607	0.0066	0.0541
19	0.0540	0.0066	0.0474
20	0.0607	0.0066	0.0541
21	0.0742	0.0066	0.0676
22	0.0697	0.0066	0.0631
23	0.0652	0.0066	0.0586
24	0.0675	0.0066	0.0609
25	0.0697	0.0066	0.0631
26	0.0945	0.0066	0.0879
27	0.1125	0.0066	0.1059
28	0.0787	0.0066	0.0721
29	0.1530	0.0066	0.1464
30	0.1642	0.0066	0.1576
31	0.1845	0.0066	0.1778
32	0.1327	0.0066	0.1261
33	0.0450	0.0066	0.0384
34	0.0405	0.0066	0.0339
35	0.0405	0.0066	0.0339
36	0.0135	0.0066	0.0069

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.24
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.01

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.2610
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.1940

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==============================================================================

                          3 - H O U R    S T O R M
                    R U N O F F    H Y D R O G R A P H

==============================================================================
                 HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
          (Note: Time indicated is at END of Each Unit Intervals)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        7.5      15.0      22.5      30.0
------------------------------------------------------------------------------
   0.083      0.0035      0.50  Q         .         .         .         .
   0.167      0.0182      2.14  V Q       .         .         .         .
   0.250      0.0369      2.72  V  Q      .         .         .         .
   0.333      0.0568      2.88  .V Q      .         .         .         .
   0.417      0.0813      3.56  .V  Q     .         .         .         .
   0.500      0.1091      4.04  .V   Q    .         .         .         .
   0.583      0.1404      4.54  . V   Q   .         .         .         .
   0.667      0.1713      4.50  .  V Q    .         .         .         .
   0.750      0.2052      4.92  .  V  Q   .         .         .         .
   0.833      0.2395      4.98  .   V Q   .         .         .         .
   0.917      0.2714      4.64  .   V Q   .         .         .         .
   1.000      0.3041      4.75  .    VQ   .         .         .         .
   1.083      0.3405      5.29  .     VQ  .         .         .         .
   1.167      0.3824      6.08  .     V Q .         .         .         .
   1.250      0.4265      6.41  .      VQ .         .         .         .
   1.333      0.4709      6.45  .       Q .         .         .         .
   1.417      0.5157      6.51  .       QV.         .         .         .
   1.500      0.5671      7.46  .        QV         .         .         .
   1.583      0.6212      7.86  .         QV        .         .         .
   1.667      0.6746      7.75  .         Q V       .         .         .
   1.750      0.7328      8.45  .         .Q V      .         .         .
   1.833      0.7984      9.53  .         . Q V     .         .         .
   1.917      0.8645      9.60  .         . Q  V    .         .         .
   2.000      0.9293      9.41  .         . Q   V   .         .         .
   2.083      0.9951      9.56  .         . Q     V .         .         .
   2.167      1.0663     10.33  .         .  Q     V.         .         .
   2.250      1.1532     12.63  .         .     Q   .V        .         .
   2.333      1.2495     13.97  .         .       Q . V       .         .
   2.417      1.3463     14.06  .         .       Q .   V     .         .
   2.500      1.4777     19.09  .         .         .    QV   .         .
   2.583      1.6323     22.44  .         .         .        Q.         .
   2.667      1.7973     23.96  .         .         .         .QV       .
   2.750      1.9319     19.53  .         .         .     Q   .    V    .
   2.833      2.0157     12.17  .         .     Q   .         .     V   .
   2.917      2.0774      8.96  .         .Q        .         .      V  .
   3.000      2.1258      7.03  .        Q.         .         .       V .
   3.083      2.1542      4.13  .    Q    .         .         .        V.
   3.167      2.1700      2.29  .  Q      .         .         .        V.
   3.250      2.1794      1.38  .Q        .         .         .        V.
   3.333      2.1855      0.88  .Q        .         .         .        V.
   3.417      2.1894      0.57  Q         .         .         .        V.
   3.500      2.1917      0.33  Q         .         .         .        V.
   3.583      2.1929      0.17  Q         .         .         .        V.
   3.667      2.1935      0.09  Q         .         .         .        V.
   3.750      2.1938      0.05  Q         .         .         .        V.
   3.833      2.1939      0.02  Q         .         .         .        V.
   3.917      2.1940      0.01  Q         .         .         .        V.
-------------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	235.0
10%	175.0
20%	130.0
30%	90.0
40%	50.0
50%	40.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    992.00 TO NODE    992.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      150.0     300.0     450.0     600.0
----------------------------------------------------------------------------
   0.083      0.0035      0.50  Q         .         .         .         .
   0.167      0.0182      2.14  Q         .         .         .         .
   0.250      0.1427     18.08  VQ        .         .         .         .
   0.333      0.3738     33.56  V Q       .         .         .         .
   0.417      0.6275     36.83  V Q       .         .         .         .
   0.500      0.9350     44.65  V Q       .         .         .         .
   0.583      1.3213     56.08  V  Q      .         .         .         .
   0.667      1.7564     63.17  V   Q     .         .         .         .
   0.750      2.2387     70.04  V   Q     .         .         .         .
   0.833      2.7725     77.50  .V   Q    .         .         .         .
   0.917      3.3393     82.31  .V   Q    .         .         .         .
   1.000      3.9352     86.52  .V   Q    .         .         .         .
   1.083      4.5837     94.16  .V    Q   .         .         .         .
   1.167      5.3125    105.82  .V     Q  .         .         .         .
   1.250      6.1259    118.10  . V    Q  .         .         .         .
   1.333      7.0056    127.74  . V     Q .         .         .         .
   1.417      7.9388    135.50  . V      Q.         .         .         .
   1.500      8.9533    147.30  .  V     Q.         .         .         .
   1.583     10.0638    161.24  .  V      Q         .         .         .
   1.667     11.2487    172.05  .   V     .Q        .         .         .
   1.750     12.5154    183.92  .   V     . Q       .         .         .
   1.833     13.8982    200.79  .    V    .  Q      .         .         .
   1.917     15.3893    216.51  .    V    .   Q     .         .         .
   2.000     16.9558    227.46  .     V   .    Q    .         .         .
   2.083     18.6036    239.25  .     V   .    Q    .         .         .
   2.167     20.3994    260.76  .      V  .      Q  .         .         .
   2.250     22.4396    296.23  .       V .        Q.         .         .
   2.333     24.7437    334.55  .        V.         . Q       .         .
   2.417     27.2572    364.95  .         V         .   Q     .         .
   2.500     30.1067    413.75  .         .V        .      Q  .         .
   2.583     33.4234    481.59  .         . V       .         . Q       .
   2.667     37.1605    542.63  .         .  V      .         .     Q   .
   2.750     41.0362    562.75  .         .    V    .         .      Q  .
   2.833     44.6914    530.74  .         .     V   .         .    Q    .
   2.917     48.0445    486.88  .         .      V  .         . Q       .
   3.000     51.1926    457.10  .         .        V.         Q         .
```

```
3.083     54.1590    430.72  .         .         V       Q .         .
3.167     56.9402    403.83  .         .         .V    Q   .         .
3.250     59.5674    381.48  .         .         . V  Q    .         .
3.333     62.0712    363.54  .         .         .  VQ     .         .
3.417     64.4706    348.40  .         .         .  QV     .         .
3.500     66.7709    334.00  .         .         . Q V     .         .
3.583     68.9775    320.40  .         .         .Q   V    .         .
3.667     71.0943    307.35  .         .         Q     V   .         .
3.750     73.1209    294.27  .         .        Q.      V  .         .
3.833     75.0485    279.89  .         .       Q .       V .         .
3.917     76.8657    263.86  .         .      Q  .       V .         .
4.000     78.5701    247.46  .         .     Q   .        V.         .
4.083     80.1656    231.68  .         .    Q    .        V.         .
4.167     81.6597    216.94  .         .   Q     .         V         .
4.250     83.0563    202.79  .         .  Q      .         .V        .
4.333     84.3593    189.20  .         . Q       .         .V        .
4.417     85.5702    175.82  .         .Q        .         .V        .
4.500     86.6880    162.30  .         Q         .         . V       .
4.583     87.7020    147.23  .        Q.         .         . V       .
4.667     88.6152    132.60  .       Q .         .         .  V      .
4.750     89.4524    121.56  .       Q .         .         .  V      .
4.833     90.2412    114.54  .      Q  .         .         .  V      .
4.917     90.9953    109.49  .      Q  .         .         .  V      .
5.000     91.7181    104.94  .     Q   .         .         .   V     .
5.083     92.4106    100.56  .     Q   .         .         .   V     .
5.167     93.0738     96.29  .     Q   .         .         .   V     .
5.250     93.7079     92.08  .     Q   .         .         .   V     .
5.333     94.3138     87.97  .    Q    .         .         .    V    .
5.417     94.8927     84.06  .    Q    .         .         .    V    .
5.500     95.4458     80.31  .    Q    .         .         .    V    .
5.583     95.9741     76.71  .    Q    .         .         .    V    .
5.667     96.4786     73.26  .   Q     .         .         .     V   .
5.750     96.9605     69.97  .   Q     .         .         .     V   .
5.833     97.4206     66.82  .   Q     .         .         .     V   .
5.917     97.8601     63.81  .   Q     .         .         .     V   .
6.000     98.2794     60.89  .   Q     .         .         .     V   .
6.083     98.6797     58.12  .  Q      .         .         .     V   .
6.167     99.0620     55.51  .  Q      .         .         .     V   .
6.250     99.4271     53.01  .  Q      .         .         .      V  .
6.333     99.7758     50.63  .  Q      .         .         .      V  .
6.417    100.1088     48.35  .  Q      .         .         .      V  .
6.500    100.4268     46.18  .  Q      .         .         .      V  .
6.583    100.7306     44.10  . Q       .         .         .      V  .
6.667    101.0207     42.12  . Q       .         .         .      V  .
6.750    101.2977     40.23  . Q       .         .         .      V  .
6.833    101.5623     38.42  . Q       .         .         .      V  .
6.917    101.8150     36.69  . Q       .         .         .       V .
7.000    102.0563     35.04  . Q       .         .         .       V .
7.083    102.2868     33.46  . Q       .         .         .       V .
7.167    102.5069     31.96  . Q       .         .         .       V .
7.250    102.7148     30.18  . Q       .         .         .       V .
7.333    102.9121     28.65  .Q        .         .         .       V .
7.417    103.1005     27.35  .Q        .         .         .       V .
7.500    103.2804     26.12  .Q        .         .         .       V .
7.583    103.4521     24.93  .Q        .         .         .       V .
7.667    103.6160     23.80  .Q        .         .         .       V .
7.750    103.7725     22.72  .Q        .         .         .       V .
7.833    103.9219     21.69  .Q        .         .         .       V .
7.917    104.0646     20.71  .Q        .         .         .       V .
8.000    104.2008     19.77  .Q        .         .         .       V .
8.083    104.3308     18.88  .Q        .         .         .       V .
8.167    104.4549     18.02  .Q        .         .         .       V .
8.250    104.5734     17.21  .Q        .         .         .        V.
```

8.333	104.6865	16.43	.Q	.	.	.	V.
8.417	104.7945	15.68	.Q	.	.	.	V.
8.500	104.8977	14.97	Q	.	.	.	V.
8.583	104.9961	14.29	Q	.	.	.	V.
8.667	105.0925	14.00	Q	.	.	.	V.
8.750	105.1841	13.29	Q	.	.	.	V.
8.833	105.2695	12.41	Q	.	.	.	V.
8.917	105.3511	11.85	Q	.	.	.	V.
9.000	105.4290	11.31	Q	.	.	.	V.
9.083	105.5034	10.80	Q	.	.	.	V.
9.167	105.5744	10.31	Q	.	.	.	V.
9.250	105.6422	9.84	Q	.	.	.	V.
9.333	105.7069	9.40	Q	.	.	.	V.
9.417	105.7687	8.97	Q	.	.	.	V.
9.500	105.8277	8.56	Q	.	.	.	V.
9.583	105.8840	8.18	Q	.	.	.	V.
9.667	105.9377	7.81	Q	.	.	.	V.
9.750	105.9890	7.45	Q	.	.	.	V.
9.833	106.0380	7.11	Q	.	.	.	V.
9.917	106.0848	6.79	Q	.	.	.	V.
10.000	106.1321	6.87	Q	.	.	.	V.
10.083	106.1764	6.42	Q	.	.	.	V.
10.167	106.2169	5.88	Q	.	.	.	V.
10.250	106.2556	5.62	Q	.	.	.	V.
10.333	106.2925	5.36	Q	.	.	.	V.
10.417	106.3278	5.12	Q	.	.	.	V.
10.500	106.3614	4.89	Q	.	.	.	V.
10.583	106.3935	4.67	Q	.	.	.	V.
10.667	106.4242	4.45	Q	.	.	.	V.
10.750	106.4535	4.25	Q	.	.	.	V.
10.833	106.4852	4.60	Q	.	.	.	V.
10.917	106.5124	3.94	Q	.	.	.	V.
11.000	106.5377	3.67	Q	.	.	.	V.
11.083	106.5618	3.51	Q	.	.	.	V.
11.167	106.5849	3.35	Q	.	.	.	V.
11.250	106.6069	3.20	Q	.	.	.	V.
11.333	106.6279	3.05	Q	.	.	.	V.
11.417	106.6508	3.33	Q	.	.	.	V.
11.500	106.6713	2.98	Q	.	.	.	V.
11.583	106.6894	2.63	Q	.	.	.	V.
11.667	106.7067	2.51	Q	.	.	.	V.
11.750	106.7232	2.39	Q	.	.	.	V.
11.833	106.7389	2.29	Q	.	.	.	V.
11.917	106.7576	2.72	Q	.	.	.	V.
12.000	106.7725	2.16	Q	.	.	.	V.
12.083	106.7860	1.96	Q	.	.	.	V.
12.167	106.7989	1.87	Q	.	.	.	V.
12.250	106.8112	1.79	Q	.	.	.	V.
12.333	106.8269	2.28	Q	.	.	.	V.
12.417	106.8384	1.66	Q	.	.	.	V.
12.500	106.8489	1.53	Q	.	.	.	V.
12.583	106.8590	1.46	Q	.	.	.	V.
12.667	106.8711	1.76	Q	.	.	.	V.
12.750	106.8820	1.58	Q	.	.	.	V.
12.833	106.8905	1.24	Q	.	.	.	V.
12.917	106.8987	1.19	Q	.	.	.	V.
13.000	106.9095	1.58	Q	.	.	.	V.
13.083	106.9181	1.25	Q	.	.	.	V.
13.167	106.9250	1.00	Q	.	.	.	V.
13.250	106.9324	1.06	Q	.	.	.	V.
13.333	106.9423	1.44	Q	.	.	.	V.
13.417	106.9481	0.84	Q	.	.	.	V.
13.500	106.9537	0.81	Q	.	.	.	V.

13.583	106.9628	1.33	Q	.	.	.	V.
13.667	106.9693	0.94	Q	.	.	.	V.
13.750	106.9783	1.30	Q	.	.	.	V.
13.833	106.9868	1.24	Q	.	.	.	V.
13.917	106.9950	1.19	Q	.	.	.	V.
14.000	107.0028	1.13	Q	.	.	.	V.
14.083	107.0102	1.08	Q	.	.	.	V.
14.167	107.0174	1.03	Q	.	.	.	V.
14.250	107.0241	0.99	Q	.	.	.	V.
14.333	107.0306	0.94	Q	.	.	.	V.
14.417	107.0368	0.90	Q	.	.	.	V.
14.500	107.0427	0.86	Q	.	.	.	V.
14.583	107.0483	0.82	Q	.	.	.	V.
14.667	107.0537	0.78	Q	.	.	.	V.
14.750	107.0589	0.75	Q	.	.	.	V.
14.833	107.0638	0.71	Q	.	.	.	V.
14.917	107.0685	0.68	Q	.	.	.	V.
15.000	107.0729	0.65	Q	.	.	.	V.
15.083	107.0772	0.62	Q	.	.	.	V.
15.167	107.0813	0.59	Q	.	.	.	V.
15.250	107.0852	0.56	Q	.	.	.	V.
15.333	107.0889	0.54	Q	.	.	.	V.
15.417	107.0924	0.51	Q	.	.	.	V.
15.500	107.0958	0.49	Q	.	.	.	V.
15.583	107.0990	0.47	Q	.	.	.	V.
15.667	107.1021	0.45	Q	.	.	.	V.
15.750	107.1051	0.43	Q	.	.	.	V.
15.833	107.1079	0.41	Q	.	.	.	V.
15.917	107.1106	0.39	Q	.	.	.	V.
16.000	107.1131	0.37	Q	.	.	.	V.
16.083	107.1156	0.36	Q	.	.	.	V.
16.167	107.1179	0.34	Q	.	.	.	V.
16.250	107.1201	0.32	Q	.	.	.	V.
16.333	107.1223	0.31	Q	.	.	.	V.
16.417	107.1243	0.30	Q	.	.	.	V.
16.500	107.1262	0.28	Q	.	.	.	V.
16.583	107.1281	0.27	Q	.	.	.	V.
16.667	107.1299	0.26	Q	.	.	.	V.
16.750	107.1315	0.25	Q	.	.	.	V.
16.833	107.1332	0.23	Q	.	.	.	V.
16.917	107.1347	0.22	Q	.	.	.	V.
17.000	107.1362	0.21	Q	.	.	.	V.
17.083	107.1376	0.20	Q	.	.	.	V.
17.167	107.1389	0.19	Q	.	.	.	V.
17.250	107.1402	0.19	Q	.	.	.	V.
17.333	107.1414	0.18	Q	.	.	.	V.
17.417	107.1426	0.17	Q	.	.	.	V.
17.500	107.1437	0.16	Q	.	.	.	V.
17.583	107.1448	0.15	Q	.	.	.	V.
17.667	107.1458	0.15	Q	.	.	.	V.
17.750	107.1467	0.14	Q	.	.	.	V.
17.833	107.1477	0.13	Q	.	.	.	V.
17.917	107.1486	0.13	Q	.	.	.	V.
18.000	107.1494	0.12	Q	.	.	.	V.
18.083	107.1502	0.12	Q	.	.	.	V.
18.167	107.1510	0.11	Q	.	.	.	V.
18.250	107.1517	0.11	Q	.	.	.	V.
18.333	107.1524	0.10	Q	.	.	.	V.
18.417	107.1531	0.10	Q	.	.	.	V.
18.500	107.1537	0.09	Q	.	.	.	V.
18.583	107.1543	0.09	Q	.	.	.	V.
18.667	107.1549	0.08	Q	.	.	.	V.
18.750	107.1555	0.08	Q	.	.	.	V.

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   18.833    107.1560      0.08  Q         .         .         .        V.
   18.917    107.1565      0.07  Q         .         .         .        V.
   19.000    107.1570      0.07  Q         .         .         .        V.
   19.083    107.1574      0.07  Q         .         .         .        V.
   19.167    107.1579      0.06  Q         .         .         .        V.
   19.250    107.1583      0.06  Q         .         .         .        V.
   19.333    107.1587      0.06  Q         .         .         .        V.
   19.417    107.1591      0.06  Q         .         .         .        V.
   19.500    107.1594      0.05  Q         .         .         .        V.
   19.583    107.1598      0.05  Q         .         .         .        V.
   19.667    107.1601      0.05  Q         .         .         .        V.
   19.750    107.1604      0.05  Q         .         .         .        V.
   19.833    107.1608      0.04  Q         .         .         .        V.
   19.917    107.1610      0.04  Q         .         .         .        V.
   20.000    107.1613      0.04  Q         .         .         .        V.
   20.083    107.1616      0.04  Q         .         .         .        V.
   20.167    107.1618      0.04  Q         .         .         .        V.
   20.250    107.1621      0.03  Q         .         .         .        V.
   20.333    107.1623      0.03  Q         .         .         .        V.
   20.417    107.1625      0.03  Q         .         .         .        V.
   20.500    107.1627      0.03  Q         .         .         .        V.
   20.583    107.1629      0.03  Q         .         .         .        V.
   20.667    107.1631      0.03  Q         .         .         .        V.
   20.750    107.1633      0.03  Q         .         .         .        V.
   20.833    107.1635      0.03  Q         .         .         .        V.
   20.917    107.1637      0.02  Q         .         .         .        V.
   21.000    107.1638      0.02  Q         .         .         .        V.
   21.083    107.1640      0.02  Q         .         .         .        V.
   21.167    107.1641      0.02  Q         .         .         .        V.
   21.250    107.1642      0.02  Q         .         .         .        V.
   21.333    107.1644      0.02  Q         .         .         .        V.
   21.417    107.1645      0.02  Q         .         .         .        V.
   21.500    107.1646      0.02  Q         .         .         .        V.
   21.583    107.1647      0.02  Q         .         .         .        V.
   21.667    107.1648      0.02  Q         .         .         .        V.
   21.750    107.1650      0.02  Q         .         .         .        V.
   21.833    107.1651      0.01  Q         .         .         .        V.
   21.917    107.1651      0.01  Q         .         .         .        V.
   22.000    107.1652      0.01  Q         .         .         .        V.
   22.083    107.1653      0.01  Q         .         .         .        V.
   22.167    107.1654      0.01  Q         .         .         .        V.
   22.250    107.1655      0.01  Q         .         .         .        V.
   22.333    107.1656      0.01  Q         .         .         .        V.
   22.417    107.1656      0.01  Q         .         .         .        V.
   22.500    107.1657      0.01  Q         .         .         .        V.
   22.583    107.1658      0.01  Q         .         .         .        V.
   22.667    107.1658      0.01  Q         .         .         .        V.
   22.750    107.1659      0.01  Q         .         .         .        V.
   22.833    107.1659      0.01  Q         .         .         .        V.
   22.917    107.1660      0.01  Q         .         .         .        V.
   23.000    107.1661      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
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    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1380.0
             10%                             330.0
             20%                             220.0
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          30%                                170.0
          40%                                130.0
          50%                                 95.0
          60%                                 65.0
          70%                                 45.0
          80%                                 30.0
          90%                                 15.0


****************************************************************************
  FLOW PROCESS FROM NODE    992.00 TO NODE    991.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
============================================================================


         MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
         STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
         VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
         EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
         OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
         UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
         (0.938)(DIAMETER):


         PIPELENGTH(FT) =      87.00     MANNINGS FACTOR = 0.013
         UPSTREAM ELEVATION(FT) =    2379.00
         DOWNSTREAM ELEVATION(FT) =    2375.00
         PIPE DIAMETER(FT) =   6.00



         NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

           TIME      INFLOW   VELOCITY   OUTFLOW   UPSTREAM
          (HRS)       (CFS)     (FPS)     (CFS)    PONDING(AF)
           0.083      0.50      0.50      0.21        0.000
           0.167      2.14      0.79      1.64        0.000
           0.250     18.08      6.65     18.08        0.000
           0.333     33.56     12.35     33.56        0.000
           0.417     36.83     13.55     36.83        0.000
           0.500     44.65     16.42     44.65        0.000
           0.583     56.08     17.53     55.94        0.000
           0.667     63.17     18.08     63.09        0.000
           0.750     70.04     18.62     69.96        0.000
           0.833     77.50     19.20     77.42        0.000
           0.917     82.31     19.57     82.26        0.000
           1.000     86.52     19.90     86.48        0.000
           1.083     94.16     20.44     94.09        0.000
           1.167    105.82     21.14    105.71        0.000
           1.250    118.10     21.88    117.99        0.000
           1.333    127.74     22.46    127.66        0.000
           1.417    135.50     22.92    135.43        0.000
           1.500    147.30     23.47    147.20        0.000
           1.583    161.24     24.12    161.12        0.000
           1.667    172.05     24.61    171.96        0.000
           1.750    183.92     25.14    183.83        0.000
           1.833    200.79     25.76    200.65        0.000
           1.917    216.51     26.34    216.39        0.000
           2.000    227.46     26.74    227.37        0.000
           2.083    239.25     27.14    239.17        0.000
           2.167    260.76     27.87    260.60        0.000
           2.250    296.23     28.80    295.96        0.000
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2.333	334.55	29.68	334.27	0.000
2.417	364.95	30.38	364.74	0.000
2.500	413.75	31.26	413.39	0.000
2.583	481.59	32.61	481.14	0.000
2.667	542.63	33.53	542.22	0.000
2.750	562.75	33.75	562.61	0.000
2.833	530.74	33.36	530.96	0.000
2.917	486.88	32.70	487.17	0.000
3.000	457.10	32.17	457.30	0.000
3.083	430.72	31.62	430.89	0.000
3.167	403.83	31.07	404.01	0.000
3.250	381.48	30.67	381.64	0.000
3.333	363.54	30.36	363.68	0.000
3.417	348.40	30.01	348.50	0.000
3.500	334.00	29.67	334.10	0.000
3.583	320.40	29.35	320.50	0.000
3.667	307.35	29.06	307.45	0.000
3.750	294.27	28.76	294.37	0.000
3.833	279.89	28.43	280.00	0.000
3.917	263.86	27.97	263.98	0.000
4.000	247.46	27.42	247.58	0.000
4.083	231.68	26.88	231.80	0.000
4.167	216.94	26.35	217.05	0.000
4.250	202.79	25.83	202.90	0.000
4.333	189.20	25.33	189.31	0.000
4.417	175.82	24.79	175.93	0.000
4.500	162.30	24.16	162.41	0.000
4.583	147.23	23.47	147.36	0.000
4.667	132.60	22.75	132.73	0.000
4.750	121.56	22.08	121.65	0.000
4.833	114.54	21.66	114.61	0.000
4.917	109.49	21.36	109.54	0.000
5.000	104.94	21.08	104.99	0.000
5.083	100.56	20.82	100.60	0.000
5.167	96.29	20.56	96.33	0.000
5.250	92.08	20.31	92.12	0.000
5.333	87.97	20.01	88.01	0.000
5.417	84.06	19.71	84.10	0.000
5.500	80.31	19.42	80.34	0.000
5.583	76.71	19.14	76.74	0.000
5.667	73.26	18.87	73.30	0.000
5.750	69.97	18.61	70.00	0.000
5.833	66.82	18.37	66.85	0.000
5.917	63.81	18.13	63.85	0.000
6.000	60.89	17.91	60.92	0.000
6.083	58.12	17.69	58.15	0.000
6.167	55.51	17.49	55.54	0.000
6.250	53.01	17.29	53.04	0.000
6.333	50.63	17.11	50.66	0.000
6.417	48.35	16.93	48.38	0.000
6.500	46.18	16.76	46.21	0.000
6.583	44.10	16.22	44.11	0.000
6.667	42.12	15.49	42.12	0.000
6.750	40.23	14.80	40.23	0.000
6.833	38.42	14.13	38.42	0.000
6.917	36.69	13.50	36.69	0.000
7.000	35.04	12.89	35.04	0.000
7.083	33.46	12.31	33.46	0.000
7.167	31.96	11.76	31.96	0.000
7.250	30.18	11.10	30.18	0.000
7.333	28.65	10.54	28.65	0.000
7.417	27.35	10.06	27.35	0.000
7.500	26.12	9.61	26.12	0.000

7.583	24.93	9.17	24.93	0.000
7.667	23.80	8.76	23.80	0.000
7.750	22.72	8.36	22.72	0.000
7.833	21.69	7.98	21.69	0.000
7.917	20.71	7.62	20.71	0.000
8.000	19.77	7.27	19.77	0.000
8.083	18.88	6.94	18.88	0.000
8.167	18.02	6.63	18.02	0.000
8.250	17.21	6.33	17.21	0.000
8.333	16.43	6.04	16.43	0.000
8.417	15.68	5.77	15.68	0.000
8.500	14.97	5.51	14.97	0.000
8.583	14.29	5.26	14.29	0.000
8.667	14.00	5.15	14.00	0.000
8.750	13.29	4.89	13.29	0.000
8.833	12.41	4.56	12.41	0.000
8.917	11.85	4.36	11.85	0.000
9.000	11.31	4.16	11.31	0.000
9.083	10.80	3.97	10.80	0.000
9.167	10.31	3.79	10.31	0.000
9.250	9.84	3.62	9.84	0.000
9.333	9.40	3.46	9.40	0.000
9.417	8.97	3.30	8.97	0.000
9.500	8.56	3.15	8.56	0.000
9.583	8.18	3.01	8.18	0.000
9.667	7.81	2.87	7.81	0.000
9.750	7.45	2.74	7.45	0.000
9.833	7.11	2.62	7.11	0.000
9.917	6.79	2.50	6.79	0.000
10.000	6.87	2.53	6.87	0.000
10.083	6.42	2.36	6.42	0.000
10.167	5.88	2.16	5.88	0.000
10.250	5.62	2.07	5.62	0.000
10.333	5.36	1.97	5.36	0.000
10.417	5.12	1.88	5.12	0.000
10.500	4.89	1.80	4.89	0.000
10.583	4.67	1.72	4.67	0.000
10.667	4.45	1.64	4.45	0.000
10.750	4.25	1.56	4.25	0.000
10.833	4.60	1.69	4.60	0.000
10.917	3.94	1.45	3.94	0.000
11.000	3.67	1.35	3.67	0.000
11.083	3.51	1.29	3.51	0.000
11.167	3.35	1.23	3.35	0.000
11.250	3.20	1.18	3.20	0.000
11.333	3.05	1.12	3.05	0.000
11.417	3.33	1.22	3.33	0.000
11.500	2.98	1.10	2.98	0.000
11.583	2.63	0.97	2.63	0.000
11.667	2.51	0.92	2.51	0.000
11.750	2.39	0.88	2.39	0.000
11.833	2.29	0.84	2.29	0.000
11.917	2.72	1.00	2.72	0.000
12.000	2.16	0.79	2.16	0.000
12.083	1.96	0.72	1.96	0.000
12.167	1.87	0.69	1.87	0.000
12.250	1.79	0.66	1.79	0.000
12.333	2.28	0.84	2.28	0.000
12.417	1.66	0.61	1.66	0.000
12.500	1.53	0.56	1.53	0.000
12.583	1.46	0.54	1.46	0.000
12.667	1.76	0.65	1.76	0.000
12.750	1.58	0.58	1.58	0.000

12.833	1.24	0.50	1.31	0.000
12.917	1.19	0.50	1.22	0.000
13.000	1.58	0.58	1.48	0.000
13.083	1.25	0.50	1.31	0.000
13.167	1.00	0.50	1.14	0.000
13.250	1.06	0.50	1.03	0.000
13.333	1.44	0.53	1.27	0.000
13.417	0.84	0.50	1.14	0.000
13.500	0.81	0.50	0.83	0.000
13.583	1.33	0.50	1.03	0.000
13.667	0.94	0.50	1.17	0.000
13.750	1.30	0.50	1.09	0.000
13.833	1.24	0.50	1.28	0.000
13.917	1.19	0.50	1.22	0.000
14.000	1.13	0.50	1.16	0.000
14.083	1.08	0.50	1.11	0.000
14.167	1.03	0.50	1.06	0.000
14.250	0.99	0.50	1.01	0.000
14.333	0.94	0.50	0.97	0.000
14.417	0.90	0.50	0.92	0.000
14.500	0.86	0.50	0.88	0.000
14.583	0.82	0.50	0.84	0.000
14.667	0.78	0.50	0.80	0.000
14.750	0.75	0.50	0.77	0.000
14.833	0.71	0.50	0.73	0.000
14.917	0.68	0.50	0.70	0.000
15.000	0.65	0.50	0.67	0.000
15.083	0.62	0.50	0.64	0.000
15.167	0.59	0.50	0.61	0.000
15.250	0.56	0.50	0.58	0.000
15.333	0.54	0.50	0.55	0.000
15.417	0.51	0.50	0.53	0.000
15.500	0.49	0.50	0.51	0.000
15.583	0.47	0.50	0.48	0.000
15.667	0.45	0.50	0.46	0.000
15.750	0.43	0.50	0.44	0.000
15.833	0.41	0.50	0.42	0.000
15.917	0.39	0.50	0.40	0.000
16.000	0.37	0.50	0.38	0.000
16.083	0.36	0.50	0.37	0.000
16.167	0.34	0.50	0.35	0.000
16.250	0.32	0.50	0.33	0.000
16.333	0.31	0.50	0.32	0.000
16.417	0.30	0.50	0.30	0.000
16.500	0.28	0.50	0.29	0.000
16.583	0.27	0.50	0.28	0.000
16.667	0.26	0.50	0.26	0.000
16.750	0.25	0.50	0.25	0.000
16.833	0.23	0.50	0.24	0.000
16.917	0.22	0.50	0.23	0.000
17.000	0.21	0.50	0.22	0.000
17.083	0.20	0.50	0.21	0.000
17.167	0.19	0.50	0.20	0.000
17.250	0.19	0.50	0.19	0.000
17.333	0.18	0.50	0.18	0.000
17.417	0.17	0.50	0.17	0.000
17.500	0.16	0.50	0.17	0.000
17.583	0.15	0.50	0.16	0.000
17.667	0.15	0.50	0.15	0.000
17.750	0.14	0.50	0.14	0.000
17.833	0.13	0.50	0.14	0.000
17.917	0.13	0.50	0.13	0.000
18.000	0.12	0.50	0.13	0.000

18.083	0.12	0.50	0.12	0.000
18.167	0.11	0.50	0.11	0.000
18.250	0.11	0.50	0.11	0.000
18.333	0.10	0.50	0.10	0.000
18.417	0.10	0.50	0.10	0.000
18.500	0.09	0.50	0.10	0.000
18.583	0.09	0.50	0.09	0.000
18.667	0.08	0.50	0.09	0.000
18.750	0.08	0.50	0.08	0.000
18.833	0.08	0.50	0.08	0.000
18.917	0.07	0.50	0.08	0.000
19.000	0.07	0.50	0.07	0.000
19.083	0.07	0.50	0.07	0.000
19.167	0.06	0.50	0.07	0.000
19.250	0.06	0.50	0.06	0.000
19.333	0.06	0.50	0.06	0.000
19.417	0.06	0.50	0.06	0.000
19.500	0.05	0.50	0.05	0.000
19.583	0.05	0.50	0.05	0.000
19.667	0.05	0.50	0.05	0.000
19.750	0.05	0.50	0.05	0.000
19.833	0.04	0.50	0.05	0.000
19.917	0.04	0.50	0.04	0.000
20.000	0.04	0.50	0.04	0.000
20.083	0.04	0.50	0.04	0.000
20.167	0.04	0.50	0.04	0.000
20.250	0.03	0.50	0.04	0.000
20.333	0.03	0.50	0.03	0.000
20.417	0.03	0.50	0.03	0.000
20.500	0.03	0.50	0.03	0.000
20.583	0.03	0.50	0.03	0.000
20.667	0.03	0.50	0.03	0.000
20.750	0.03	0.50	0.03	0.000
20.833	0.03	0.50	0.03	0.000
20.917	0.02	0.50	0.02	0.000
21.000	0.02	0.50	0.02	0.000
21.083	0.02	0.50	0.02	0.000
21.167	0.02	0.50	0.02	0.000
21.250	0.02	0.50	0.02	0.000
21.333	0.02	0.50	0.02	0.000
21.417	0.02	0.50	0.02	0.000
21.500	0.02	0.50	0.02	0.000
21.583	0.02	0.50	0.02	0.000
21.667	0.02	0.50	0.02	0.000
21.750	0.02	0.50	0.02	0.000
21.833	0.01	0.50	0.01	0.000
21.917	0.01	0.50	0.01	0.000
22.000	0.01	0.50	0.01	0.000
22.083	0.01	0.50	0.01	0.000
22.167	0.01	0.50	0.01	0.000
22.250	0.01	0.50	0.01	0.000
22.333	0.01	0.50	0.01	0.000
22.417	0.01	0.50	0.01	0.000
22.500	0.01	0.50	0.01	0.000
22.583	0.01	0.50	0.01	0.000
22.667	0.01	0.50	0.01	0.000
22.750	0.01	0.50	0.01	0.000
22.833	0.01	0.50	0.01	0.000
22.917	0.01	0.50	0.01	0.000
23.000	0.01	0.50	0.01	0.000
23.083	0.01	0.50	0.01	0.000
23.167	0.01	0.50	0.01	0.000
23.250	0.01	0.50	0.01	0.000

```
        23.333      0.01      0.50      0.01        0.000
        23.417      0.01      0.50      0.01        0.000
        23.500      0.01      0.50      0.01        0.000
        23.583      0.01      0.50      0.01        0.000
        23.667      0.01      0.50      0.01        0.000
        23.750      0.00      0.50      0.01        0.000
        23.833      0.00      0.50      0.00        0.000
        23.917      0.00      0.50      0.00        0.000
        24.000      0.00      0.50      0.00        0.000


****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE    991.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERSHED AREA =      26.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.088
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH         UNIT HYDROGRAPH
     NUMBER          MEAN VALUES         ORDINATES(CFS)
----------------------------------------------------------------------------
        1               13.994                 44.848
        2               59.664                146.366
        3               78.792                 61.303
        4               86.766                 25.554
        5               91.428                 14.941
        6               94.514                  9.891
        7               96.650                  6.844
        8               98.044                  4.469
        9               98.699                  2.097
       10               99.289                  1.892
       11               99.716                  1.367
       12               99.929                  0.684
       13              100.000                  0.228
```

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0073	0.0219
2	0.0292	0.0073	0.0219
3	0.0247	0.0073	0.0174
4	0.0337	0.0073	0.0264
5	0.0337	0.0073	0.0264
6	0.0405	0.0073	0.0332
7	0.0337	0.0073	0.0264
8	0.0405	0.0073	0.0332
9	0.0405	0.0073	0.0332
10	0.0337	0.0073	0.0264
11	0.0360	0.0073	0.0287
12	0.0405	0.0073	0.0332
13	0.0495	0.0073	0.0422
14	0.0495	0.0073	0.0422
15	0.0495	0.0073	0.0422
16	0.0450	0.0073	0.0377
17	0.0585	0.0073	0.0512
18	0.0607	0.0073	0.0534
19	0.0540	0.0073	0.0467
20	0.0607	0.0073	0.0534
21	0.0742	0.0073	0.0669
22	0.0697	0.0073	0.0624
23	0.0652	0.0073	0.0579
24	0.0675	0.0073	0.0602
25	0.0697	0.0073	0.0624
26	0.0945	0.0073	0.0871
27	0.1125	0.0073	0.1051
28	0.0787	0.0073	0.0714
29	0.1530	0.0073	0.1456
30	0.1642	0.0073	0.1569
31	0.1845	0.0073	0.1771
32	0.1327	0.0073	0.1254
33	0.0450	0.0073	0.0377
34	0.0405	0.0073	0.0332
35	0.0405	0.0073	0.0332
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.26
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.99

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.5824
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 4.3836

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============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       12.5      25.0      37.5      50.0
----------------------------------------------------------------------------
   0.083      0.0068      0.98  Q         .         .         .         .
   0.167      0.0356      4.19  V  Q      .         .         .         .
   0.250      0.0723      5.33  V   Q     .         .         .         .
   0.333      0.1111      5.63  .V  Q     .         .         .         .
   0.417      0.1594      7.00  .V   Q    .         .         .         .
   0.500      0.2142      7.96  .V    Q   .         .         .         .
   0.583      0.2759      8.96  . V    Q  .         .         .         .
   0.667      0.3370      8.87  .  V   Q  .         .         .         .
   0.750      0.4039      9.72  .  V   Q  .         .         .         .
   0.833      0.4718      9.85  .   V  Q  .         .         .         .
   0.917      0.5348      9.16  .   V  Q  .         .         .         .
   1.000      0.5994      9.38  .    V Q  .         .         .         .
   1.083      0.6716     10.48  .     V Q .         .         .         .
   1.167      0.7547     12.06  .     V  Q.         .         .         .
   1.250      0.8424     12.73  .      V  Q         .         .         .
   1.333      0.9306     12.82  .       V Q         .         .         .
   1.417      1.0197     12.94  .        VQ         .         .         .
   1.500      1.1220     14.86  .         VQ        .         .         .
   1.583      1.2300     15.67  .         .VQ       .         .         .
   1.667      1.3364     15.45  .         . Q       .         .         .
   1.750      1.4526     16.87  .         .  Q      .         .         .
   1.833      1.5838     19.05  .         .   VQ    .         .         .
   1.917      1.7160     19.19  .         .    Q    .         .         .
   2.000      1.8455     18.81  .         .    QV   .         .         .
   2.083      1.9771     19.11  .         .    Q  V .         .         .
   2.167      2.1195     20.68  .         .     Q  V.         .         .
   2.250      2.2939     25.32  .         .         Q         .         .
   2.333      2.4870     28.04  .         .         . Q       .         .
   2.417      2.6813     28.21  .         .         . Q V     .         .
   2.500      2.9456     38.38  .         .         .     V   Q         .
   2.583      3.2567     45.17  .         .         .        V.     Q   .
   2.667      3.5890     48.25  .         .         .         . V     Q .
   2.750      3.8596     39.28  .         .         .         .Q   V    .
   2.833      4.0276     24.39  .         .        Q.         .     V   .
   2.917      4.1508     17.89  .         .   Q     .         .      V  .
   3.000      4.2474     14.02  .         .Q        .         .       V .
   3.083      4.3041      8.24  .     Q   .         .         .        V.
   3.167      4.3356      4.57  .  Q      .         .         .        V.
   3.250      4.3546      2.75  . Q       .         .         .        V.
   3.333      4.3666      1.75  .Q        .         .         .        V.
   3.417      4.3745      1.14  Q         .         .         .        V.
   3.500      4.3791      0.66  Q         .         .         .        V.
   3.583      4.3814      0.34  Q         .         .         .        V.
   3.667      4.3826      0.18  Q         .         .         .        V.
   3.750      4.3832      0.09  Q         .         .         .        V.
   3.833      4.3835      0.04  Q         .         .         .        V.
   3.917      4.3836      0.01  Q         .         .         .        V.
   4.000      4.3836      0.00  Q         .         .         .         V
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
```

```
   an instantaneous time duration)

   Percentile of Estimated              Duration
       Peak Flow Rate                   (minutes)
   =======================              =========
             0%                           240.0
            10%                           175.0
            20%                           130.0
            30%                            90.0
            40%                            45.0
            50%                            40.0
            60%                            20.0
            70%                            20.0
            80%                            15.0
            90%                            10.0


****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE    991.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 2 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       50.0     100.0     150.0     200.0
----------------------------------------------------------------------------
   0.083      0.0085      1.23  Q         .         .         .         .
   0.167      0.0458      5.42  VQ        .         .         .         .
   0.250      0.0990      7.72  VQ        .         .         .         .
   0.333      0.1591      8.72  VQ        .         .         .         .
   0.417      0.2338     10.85  V Q       .         .         .         .
   0.500      0.3219     12.81  V Q       .         .         .         .
   0.583      0.4240     14.82  .VQ       .         .         .         .
   0.667      0.5310     15.54  .V Q      .         .         .         .
   0.750      0.6493     17.18  .V Q      .         .         .         .
   0.833      0.7741     18.12  .V Q      .         .         .         .
   0.917      0.8975     17.91  . VQ      .         .         .         .
   1.000      1.0254     18.58  . VQ      .         .         .         .
   1.083      1.1670     20.56  . V Q     .         .         .         .
   1.167      1.3286     23.47  .  VQ     .         .         .         .
   1.250      1.5039     25.45  .  V Q    .         .         .         .
   1.333      1.6864     26.51  .   VQ    .         .         .         .
   1.417      1.8755     27.46  .   VQ    .         .         .         .
   1.500      2.0869     30.69  .    VQ   .         .         .         .
   1.583      2.3145     33.04  .    VQ   .         .         .         .
   1.667      2.5482     33.94  .     Q   .         .         .         .
   1.750      2.8004     36.62  .     VQ  .         .         .         .
   1.833      3.0807     40.69  .      VQ .         .         .         .
   1.917      3.3737     42.55  .       Q .         .         .         .
   2.000      3.6717     43.27  .       QV.         .         .         .
   2.083      3.9810     44.90  .       QV.         .         .         .
   2.167      4.3185     49.01  .        QV         .         .         .
   2.250      4.7152     57.61  .         .Q        .         .         .
   2.333      5.1588     64.41  .         . Q       .         .         .
   2.417      5.6258     67.81  .         .  QV     .         .         .
   2.500      6.1992     83.25  .         .    VQ   .         .         .
   2.583      6.8710     97.55  .         .      V Q.         .         .
   2.667      7.6086    107.10  .         .       V .Q       .         .
   2.750      8.2974    100.01  .         .         Q        .         .
   2.833      8.8572     81.29  .         .     Q   . V      .         .
   2.917      9.3402     70.13  .         .   Q     .  V     .         .
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3.000      9.7777     63.52  .         . Q       .   V     .         .
3.083     10.1576     55.17  .         .Q        .    V    .         .
3.167     10.4929     48.67  .        Q.         .     V   .         .
3.250     10.7995     44.53  .       Q .         .     V   .         .
3.333     11.0867     41.70  .       Q .         .      V  .         .
3.417     11.3586     39.48  .      Q  .         .       V .         .
3.500     11.6165     37.45  .      Q  .         .       V .         .
3.583     11.8620     35.65  .      Q  .         .        V.         .
3.667     12.0965     34.05  .     Q   .         .         V         .
3.750     12.3205     32.52  .     Q   .         .         V         .
3.833     12.5328     30.83  .     Q   .         .         .V        .
3.917     12.7322     28.96  .    Q    .         .         .V        .
4.000     12.9191     27.13  .    Q    .         .         . V       .
4.083     13.0940     25.40  .    Q    .         .         . V       .
4.167     13.2577     23.77  .   Q     .         .         .  V      .
4.250     13.4106     22.20  .   Q     .         .         .  V      .
4.333     13.5531     20.69  .   Q     .         .         .  V      .
4.417     13.6857     19.25  .  Q      .         .         .   V     .
4.500     13.8077     17.72  .  Q      .         .         .   V     .
4.583     13.9178     15.99  .  Q      .         .         .   V     .
4.667     14.0168     14.37  . Q       .         .         .   V     .
4.750     14.1081     13.25  . Q       .         .         .    V    .
4.833     14.1947     12.57  . Q       .         .         .    V    .
4.917     14.2776     12.04  . Q       .         .         .    V    .
5.000     14.3571     11.54  . Q       .         .         .    V    .
5.083     14.4333     11.06  . Q       .         .         .    V    .
5.167     14.5062     10.58  . Q       .         .         .     V   .
5.250     14.5759     10.12  . Q       .         .         .     V   .
5.333     14.6425      9.67  .Q        .         .         .     V   .
5.417     14.7061      9.24  .Q        .         .         .     V   .
5.500     14.7668      8.82  .Q        .         .         .     V   .
5.583     14.8248      8.42  .Q        .         .         .     V   .
5.667     14.8802      8.04  .Q        .         .         .      V  .
5.750     14.9331      7.68  .Q        .         .         .      V  .
5.833     14.9836      7.33  .Q        .         .         .      V  .
5.917     15.0317      7.00  .Q        .         .         .      V  .
6.000     15.0777      6.68  .Q        .         .         .      V  .
6.083     15.1217      6.38  .Q        .         .         .      V  .
6.167     15.1636      6.09  .Q        .         .         .      V  .
6.250     15.2036      5.81  .Q        .         .         .      V  .
6.333     15.2419      5.55  .Q        .         .         .      V  .
6.417     15.2783      5.30  .Q        .         .         .       V .
6.500     15.3132      5.06  .Q        .         .         .       V .
6.583     15.3464      4.83  Q         .         .         .       V .
6.667     15.3782      4.61  Q         .         .         .       V .
6.750     15.4085      4.40  Q         .         .         .       V .
6.833     15.4374      4.20  Q         .         .         .       V .
6.917     15.4651      4.01  Q         .         .         .       V .
7.000     15.4914      3.83  Q         .         .         .       V .
7.083     15.5166      3.66  Q         .         .         .       V .
7.167     15.5407      3.49  Q         .         .         .       V .
7.250     15.5636      3.33  Q         .         .         .       V .
7.333     15.5855      3.18  Q         .         .         .       V .
7.417     15.6064      3.04  Q         .         .         .       V .
7.500     15.6264      2.90  Q         .         .         .       V .
7.583     15.6455      2.77  Q         .         .         .       V .
7.667     15.6637      2.64  Q         .         .         .        V.
7.750     15.6811      2.52  Q         .         .         .        V.
7.833     15.6976      2.41  Q         .         .         .        V.
7.917     15.7135      2.30  Q         .         .         .        V.
8.000     15.7286      2.20  Q         .         .         .        V.
8.083     15.7430      2.10  Q         .         .         .        V.
8.167     15.7568      2.00  Q         .         .         .        V.
```

8.250	15.7700	1.91	Q	.	.	.	V.
8.333	15.7826	1.82	Q	.	.	.	V.
8.417	15.7945	1.74	Q	.	.	.	V.
8.500	15.8060	1.66	Q	.	.	.	V.
8.583	15.8169	1.59	Q	.	.	.	V.
8.667	15.8274	1.52	Q	.	.	.	V.
8.750	15.8373	1.45	Q	.	.	.	V.
8.833	15.8468	1.38	Q	.	.	.	V.
8.917	15.8559	1.32	Q	.	.	.	V.
9.000	15.8646	1.26	Q	.	.	.	V.
9.083	15.8729	1.20	Q	.	.	.	V.
9.167	15.8808	1.15	Q	.	.	.	V.
9.250	15.8883	1.10	Q	.	.	.	V.
9.333	15.8955	1.05	Q	.	.	.	V.
9.417	15.9024	1.00	Q	.	.	.	V.
9.500	15.9090	0.95	Q	.	.	.	V.
9.583	15.9152	0.91	Q	.	.	.	V.
9.667	15.9212	0.87	Q	.	.	.	V.
9.750	15.9269	0.83	Q	.	.	.	V.
9.833	15.9324	0.79	Q	.	.	.	V.
9.917	15.9376	0.76	Q	.	.	.	V.
10.000	15.9425	0.72	Q	.	.	.	V.
10.083	15.9473	0.69	Q	.	.	.	V.
10.167	15.9518	0.66	Q	.	.	.	V.
10.250	15.9561	0.63	Q	.	.	.	V.
10.333	15.9603	0.60	Q	.	.	.	V.
10.417	15.9642	0.57	Q	.	.	.	V.
10.500	15.9680	0.55	Q	.	.	.	V.
10.583	15.9716	0.52	Q	.	.	.	V.
10.667	15.9750	0.50	Q	.	.	.	V.
10.750	15.9783	0.48	Q	.	.	.	V.
10.833	15.9814	0.45	Q	.	.	.	V.
10.917	15.9844	0.43	Q	.	.	.	V.
11.000	15.9872	0.41	Q	.	.	.	V.
11.083	15.9900	0.40	Q	.	.	.	V.
11.167	15.9926	0.38	Q	.	.	.	V.
11.250	15.9950	0.36	Q	.	.	.	V.
11.333	15.9974	0.34	Q	.	.	.	V.
11.417	15.9997	0.33	Q	.	.	.	V.
11.500	16.0018	0.31	Q	.	.	.	V.
11.583	16.0039	0.30	Q	.	.	.	V.
11.667	16.0058	0.29	Q	.	.	.	V.
11.750	16.0077	0.27	Q	.	.	.	V.
11.833	16.0095	0.26	Q	.	.	.	V.
11.917	16.0112	0.25	Q	.	.	.	V.
12.000	16.0129	0.24	Q	.	.	.	V.
12.083	16.0144	0.23	Q	.	.	.	V.
12.167	16.0159	0.22	Q	.	.	.	V.
12.250	16.0173	0.21	Q	.	.	.	V.
12.333	16.0187	0.20	Q	.	.	.	V.
12.417	16.0200	0.19	Q	.	.	.	V.
12.500	16.0212	0.18	Q	.	.	.	V.
12.583	16.0224	0.17	Q	.	.	.	V.
12.667	16.0235	0.16	Q	.	.	.	V.
12.750	16.0246	0.16	Q	.	.	.	V.
12.833	16.0256	0.15	Q	.	.	.	V.
12.917	16.0266	0.14	Q	.	.	.	V.
13.000	16.0276	0.14	Q	.	.	.	V.
13.083	16.0284	0.13	Q	.	.	.	V.
13.167	16.0293	0.12	Q	.	.	.	V.
13.250	16.0301	0.12	Q	.	.	.	V.
13.333	16.0309	0.11	Q	.	.	.	V.
13.417	16.0316	0.11	Q	.	.	.	V.

```
   13.500     16.0323      0.10  Q         .         .         .        V.
   13.583     16.0330      0.10  Q         .         .         .        V.
   13.667     16.0337      0.09  Q         .         .         .        V.
   13.750     16.0343      0.09  Q         .         .         .        V.
   13.833     16.0349      0.09  Q         .         .         .        V.
   13.917     16.0354      0.08  Q         .         .         .        V.
   14.000     16.0360      0.08  Q         .         .         .        V.
   14.083     16.0365      0.07  Q         .         .         .        V.
   14.167     16.0370      0.07  Q         .         .         .        V.
   14.250     16.0374      0.07  Q         .         .         .        V.
   14.333     16.0379      0.06  Q         .         .         .        V.
   14.417     16.0383      0.06  Q         .         .         .        V.
   14.500     16.0387      0.06  Q         .         .         .        V.
   14.583     16.0391      0.06  Q         .         .         .        V.
   14.667     16.0395      0.05  Q         .         .         .        V.
   14.750     16.0398      0.05  Q         .         .         .        V.
   14.833     16.0402      0.05  Q         .         .         .        V.
   14.917     16.0405      0.05  Q         .         .         .        V.
   15.000     16.0408      0.04  Q         .         .         .        V.
   15.083     16.0411      0.04  Q         .         .         .        V.
   15.167     16.0414      0.04  Q         .         .         .        V.
   15.250     16.0416      0.04  Q         .         .         .        V.
   15.333     16.0419      0.04  Q         .         .         .        V.
   15.417     16.0421      0.04  Q         .         .         .        V.
   15.500     16.0424      0.03  Q         .         .         .        V.
   15.583     16.0426      0.03  Q         .         .         .        V.
   15.667     16.0428      0.03  Q         .         .         .        V.
   15.750     16.0430      0.03  Q         .         .         .        V.
   15.833     16.0432      0.03  Q         .         .         .        V.
   15.917     16.0434      0.03  Q         .         .         .        V.
   16.000     16.0436      0.03  Q         .         .         .        V.
   16.083     16.0437      0.02  Q         .         .         .        V.
   16.167     16.0439      0.02  Q         .         .         .        V.
   16.250     16.0441      0.02  Q         .         .         .        V.
   16.333     16.0442      0.02  Q         .         .         .        V.
   16.417     16.0443      0.02  Q         .         .         .        V.
   16.500     16.0445      0.02  Q         .         .         .        V.
   16.583     16.0446      0.02  Q         .         .         .        V.
   16.667     16.0447      0.02  Q         .         .         .        V.
   16.750     16.0448      0.02  Q         .         .         .        V.
   16.833     16.0450      0.02  Q         .         .         .        V.
   16.917     16.0451      0.02  Q         .         .         .        V.
   17.000     16.0452      0.01  Q         .         .         .        V.
   17.083     16.0453      0.01  Q         .         .         .        V.
   17.167     16.0453      0.01  Q         .         .         .        V.
   17.250     16.0454      0.01  Q         .         .         .        V.
   17.333     16.0455      0.01  Q         .         .         .        V.
   17.417     16.0456      0.01  Q         .         .         .        V.
   17.500     16.0457      0.01  Q         .         .         .        V.
   17.583     16.0457      0.01  Q         .         .         .        V.
   17.667     16.0458      0.01  Q         .         .         .        V.
   17.750     16.0459      0.01  Q         .         .         .        V.
   17.833     16.0459      0.01  Q         .         .         .        V.
   17.917     16.0460      0.01  Q         .         .         .        V.
   18.000     16.0461      0.01  Q         .         .         .        V.
   18.083     16.0461      0.01  Q         .         .         .        V.
   18.167     16.0462      0.01  Q         .         .         .        V.
   18.250     16.0462      0.01  Q         .         .         .        V.
   18.333     16.0463      0.01  Q         .         .         .        V.
   18.417     16.0463      0.01  Q         .         .         .        V.
----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
```

```
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated               Duration
       Peak Flow Rate                    (minutes)
   =======================               =========
             0%                           1105.0
            10%                            285.0
            20%                            190.0
            30%                            135.0
            40%                             80.0
            50%                             55.0
            60%                             40.0
            70%                             25.0
            80%                             15.0
            90%                             15.0


****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE    991.00 IS CODE =   7
----------------------------------------------------------------------------
  >>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<
============================================================================


****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE    991.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0099      1.44  Q         .         .         .         .
   0.167      0.0586      7.06  Q         .         .         .         .
   0.250      0.2363     25.80  VQ        .         .         .         .
   0.333      0.5275     42.28  V Q       .         .         .         .
   0.417      0.8558     47.68  V Q       .         .         .         .
   0.500      1.2516     57.46  V  Q      .         .         .         .
   0.583      1.7389     70.76  V   Q     .         .         .         .
   0.667      2.2804     78.62  V   Q     .         .         .         .
   0.750      2.8805     87.14  V   Q     .         .         .         .
   0.833      3.5386     95.55  .V   Q    .         .         .         .
   0.917      4.2284    100.17  .V   Q    .         .         .         .
   1.000      4.9519    105.05  .V    Q   .         .         .         .
   1.083      5.7415    114.65  .V    Q   .         .         .         .
   1.167      6.6311    129.17  . V    Q  .         .         .         .
   1.250      7.6189    143.43  . V     Q .         .         .         .
   1.333      8.6807    154.17  . V     Q .         .         .         .
   1.417      9.8025    162.89  .  V     Q.         .         .         .
   1.500     11.0276    177.88  .  V      Q         .         .         .
   1.583     12.3649    194.17  .   V     .Q        .         .         .
   1.667     13.7829    205.90  .   V     .Q        .         .         .
   1.750     15.3012    220.45  .   V     . Q       .         .         .
   1.833     16.9633    241.34  .    V    .  Q      .         .         .
   1.917     18.7466    258.94  .     V   .   Q     .         .         .
   2.000     20.6106    270.64  .     V   .    Q    .         .         .
   2.083     22.5669    284.06  .      V  .     Q   .         .         .
   2.167     24.6992    309.61  .       V .      Q  .         .         .
   2.250     27.1343    353.57  .       V .         Q         .         .
```

```
2.333     29.8800    398.68  .        V.         . Q       .         .
2.417     32.8590    432.54  .         V         .   Q     .         .
2.500     36.2794    496.64  .         .V        .       Q .         .
2.583     40.2649    578.69  .         .  V      .         .  Q      .
2.667     44.7368    649.32  .         .   V     .         .      Q  .
2.750     49.3003    662.62  .         .     V   .         .      Q  .
2.833     53.5169    612.25  .         .      V  .         .   Q     .
2.917     57.3550    557.30  .         .       V .         .Q        .
3.000     60.9419    520.82  .         .        V.        Q.         .
3.083     64.2894    486.06  .         .         V      Q  .         .
3.167     67.4071    452.68  .         .         .V   Q    .         .
3.250     70.3421    426.17  .         .         . V Q     .         .
3.333     73.1339    405.37  .         .         .  Q      .         .
3.417     75.8060    387.98  .         .         . Q V     .         .
3.500     78.3649    371.55  .         .         .Q   V    .         .
3.583     80.8177    356.15  .         .         Q     V   .         .
3.667     83.1697    341.50  .         .        Q.     V   .         .
3.750     85.4210    326.89  .         .       Q .      V  .         .
3.833     87.5617    310.83  .         .      Q  .       V .         .
3.917     89.5791    292.93  .         .     Q   .        V.         .
4.000     91.4711    274.71  .         .    Q    .        V.         .
4.083     93.2424    257.20  .         .   Q     .         V         .
4.167     94.9010    240.82  .         .  Q      .         V         .
4.250     96.4512    225.09  .         . Q       .         .V        .
4.333     97.8975    210.00  .         . Q       .         .V        .
4.417     99.2417    195.18  .         .Q        .         . V       .
4.500    100.4823    180.13  .         Q         .         . V       .
4.583    101.6073    163.36  .        Q.         .         . V       .
4.667    102.6204    147.10  .       Q .         .         .  V      .
4.750    103.5495    134.90  .      Q  .         .         .  V      .
4.833    104.4254    127.18  .      Q  .         .         .  V      .
4.917    105.2627    121.58  .     Q   .         .         .   V     .
5.000    106.0653    116.53  .     Q   .         .         .   V     .
5.083    106.8343    111.66  .     Q   .         .         .   V     .
5.167    107.5706    106.92  .     Q   .         .         .   V     .
5.250    108.2747    102.24  .    Q    .         .         .    V    .
5.333    108.9474     97.68  .    Q    .         .         .    V    .
5.417    109.5903     93.34  .    Q    .         .         .    V    .
5.500    110.2043     89.17  .    Q    .         .         .    V    .
5.583    110.7909     85.17  .   Q     .         .         .    V    .
5.667    111.3511     81.34  .   Q     .         .         .     V   .
5.750    111.8860     77.68  .   Q     .         .         .     V   .
5.833    112.3969     74.18  .   Q     .         .         .     V   .
5.917    112.8848     70.84  .   Q     .         .         .     V   .
6.000    113.3504     67.60  .  Q      .         .         .     V   .
6.083    113.7948     64.53  .  Q      .         .         .     V   .
6.167    114.2193     61.63  .  Q      .         .         .      V  .
6.250    114.6246     58.86  .  Q      .         .         .      V  .
6.333    115.0118     56.21  .  Q      .         .         .      V  .
6.417    115.3815     53.68  .  Q      .         .         .      V  .
6.500    115.7346     51.27  . Q       .         .         .      V  .
6.583    116.0716     48.94  . Q       .         .         .      V  .
6.667    116.3935     46.73  . Q       .         .         .      V  .
6.750    116.7008     44.63  . Q       .         .         .      V  .
6.833    116.9943     42.62  . Q       .         .         .      V  .
6.917    117.2747     40.70  . Q       .         .         .       V .
7.000    117.5424     38.87  . Q       .         .         .       V .
7.083    117.7980     37.12  . Q       .         .         .       V .
7.167    118.0422     35.45  . Q       .         .         .       V .
7.250    118.2730     33.52  .Q        .         .         .       V .
7.333    118.4922     31.83  .Q        .         .         .       V .
7.417    118.7016     30.39  .Q        .         .         .       V .
7.500    118.9014     29.01  .Q        .         .         .       V .
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7.583	119.0922	27.70	.Q	.	.	.	V .
7.667	119.2743	26.45	.Q	.	.	.	V .
7.750	119.4482	25.25	.Q	.	.	.	V .
7.833	119.6142	24.10	.Q	.	.	.	V .
7.917	119.7727	23.01	.Q	.	.	.	V .
8.000	119.9240	21.97	.Q	.	.	.	V .
8.083	120.0684	20.97	.Q	.	.	.	V .
8.167	120.2063	20.02	.Q	.	.	.	V.
8.250	120.3380	19.12	.Q	.	.	.	V.
8.333	120.4637	18.25	.Q	.	.	.	V.
8.417	120.5837	17.42	Q	.	.	.	V.
8.500	120.6982	16.63	Q	.	.	.	V.
8.583	120.8076	15.88	Q	.	.	.	V.
8.667	120.9145	15.52	Q	.	.	.	V.
8.750	121.0160	14.74	Q	.	.	.	V.
8.833	121.1110	13.79	Q	.	.	.	V.
8.917	121.2016	13.17	Q	.	.	.	V.
9.000	121.2882	12.57	Q	.	.	.	V.
9.083	121.3708	12.00	Q	.	.	.	V.
9.167	121.4498	11.46	Q	.	.	.	V.
9.250	121.5251	10.94	Q	.	.	.	V.
9.333	121.5970	10.44	Q	.	.	.	V.
9.417	121.6656	9.97	Q	.	.	.	V.
9.500	121.7312	9.52	Q	.	.	.	V.
9.583	121.7938	9.09	Q	.	.	.	V.
9.667	121.8535	8.67	Q	.	.	.	V.
9.750	121.9106	8.28	Q	.	.	.	V.
9.833	121.9650	7.91	Q	.	.	.	V.
9.917	122.0170	7.55	Q	.	.	.	V.
10.000	122.0693	7.59	Q	.	.	.	V.
10.083	122.1182	7.11	Q	.	.	.	V.
10.167	122.1633	6.54	Q	.	.	.	V.
10.250	122.2063	6.24	Q	.	.	.	V.
10.333	122.2474	5.96	Q	.	.	.	V.
10.417	122.2865	5.69	Q	.	.	.	V.
10.500	122.3240	5.43	Q	.	.	.	V.
10.583	122.3597	5.19	Q	.	.	.	V.
10.667	122.3938	4.95	Q	.	.	.	V.
10.750	122.4264	4.73	Q	.	.	.	V.
10.833	122.4612	5.06	Q	.	.	.	V.
10.917	122.4913	4.37	Q	.	.	.	V.
11.000	122.5195	4.09	Q	.	.	.	V.
11.083	122.5463	3.90	Q	.	.	.	V.
11.167	122.5720	3.72	Q	.	.	.	V.
11.250	122.5965	3.56	Q	.	.	.	V.
11.333	122.6199	3.39	Q	.	.	.	V.
11.417	122.6450	3.66	Q	.	.	.	V.
11.500	122.6677	3.29	Q	.	.	.	V.
11.583	122.6879	2.93	Q	.	.	.	V.
11.667	122.7071	2.79	Q	.	.	.	V.
11.750	122.7255	2.67	Q	.	.	.	V.
11.833	122.7430	2.55	Q	.	.	.	V.
11.917	122.7634	2.96	Q	.	.	.	V.
12.000	122.7799	2.40	Q	.	.	.	V.
12.083	122.7950	2.19	Q	.	.	.	V.
12.167	122.8094	2.09	Q	.	.	.	V.
12.250	122.8231	1.99	Q	.	.	.	V.
12.333	122.8402	2.48	Q	.	.	.	V.
12.417	122.8529	1.85	Q	.	.	.	V.
12.500	122.8647	1.71	Q	.	.	.	V.
12.583	122.8759	1.63	Q	.	.	.	V.
12.667	122.8892	1.93	Q	.	.	.	V.
12.750	122.9011	1.73	Q	.	.	.	V.

12.833	122.9112	1.46	Q	.	.	.	V.
12.917	122.9205	1.36	Q	.	.	.	V.
13.000	122.9317	1.61	Q	.	.	.	V.
13.083	122.9416	1.44	Q	.	.	.	V.
13.167	122.9503	1.27	Q	.	.	.	V.
13.250	122.9582	1.15	Q	.	.	.	V.
13.333	122.9677	1.38	Q	.	.	.	V.
13.417	122.9763	1.25	Q	.	.	.	V.
13.500	122.9828	0.93	Q	.	.	.	V.
13.583	122.9905	1.13	Q	.	.	.	V.
13.667	122.9992	1.26	Q	.	.	.	V.
13.750	123.0074	1.18	Q	.	.	.	V.
13.833	123.0167	1.36	Q	.	.	.	V.
13.917	123.0257	1.30	Q	.	.	.	V.
14.000	123.0342	1.24	Q	.	.	.	V.
14.083	123.0424	1.19	Q	.	.	.	V.
14.167	123.0502	1.13	Q	.	.	.	V.
14.250	123.0576	1.08	Q	.	.	.	V.
14.333	123.0647	1.03	Q	.	.	.	V.
14.417	123.0715	0.98	Q	.	.	.	V.
14.500	123.0780	0.94	Q	.	.	.	V.
14.583	123.0842	0.90	Q	.	.	.	V.
14.667	123.0901	0.86	Q	.	.	.	V.
14.750	123.0957	0.82	Q	.	.	.	V.
14.833	123.1011	0.78	Q	.	.	.	V.
14.917	123.1062	0.75	Q	.	.	.	V.
15.000	123.1111	0.71	Q	.	.	.	V.
15.083	123.1158	0.68	Q	.	.	.	V.
15.167	123.1203	0.65	Q	.	.	.	V.
15.250	123.1245	0.62	Q	.	.	.	V.
15.333	123.1286	0.59	Q	.	.	.	V.
15.417	123.1325	0.56	Q	.	.	.	V.
15.500	123.1362	0.54	Q	.	.	.	V.
15.583	123.1397	0.51	Q	.	.	.	V.
15.667	123.1431	0.49	Q	.	.	.	V.
15.750	123.1463	0.47	Q	.	.	.	V.
15.833	123.1494	0.45	Q	.	.	.	V.
15.917	123.1524	0.43	Q	.	.	.	V.
16.000	123.1552	0.41	Q	.	.	.	V.
16.083	123.1579	0.39	Q	.	.	.	V.
16.167	123.1604	0.37	Q	.	.	.	V.
16.250	123.1629	0.36	Q	.	.	.	V.
16.333	123.1652	0.34	Q	.	.	.	V.
16.417	123.1674	0.32	Q	.	.	.	V.
16.500	123.1696	0.31	Q	.	.	.	V.
16.583	123.1716	0.29	Q	.	.	.	V.
16.667	123.1735	0.28	Q	.	.	.	V.
16.750	123.1754	0.27	Q	.	.	.	V.
16.833	123.1771	0.26	Q	.	.	.	V.
16.917	123.1788	0.25	Q	.	.	.	V.
17.000	123.1804	0.23	Q	.	.	.	V.
17.083	123.1820	0.22	Q	.	.	.	V.
17.167	123.1834	0.21	Q	.	.	.	V.
17.250	123.1849	0.20	Q	.	.	.	V.
17.333	123.1862	0.19	Q	.	.	.	V.
17.417	123.1875	0.19	Q	.	.	.	V.
17.500	123.1887	0.18	Q	.	.	.	V.
17.583	123.1898	0.17	Q	.	.	.	V.
17.667	123.1910	0.16	Q	.	.	.	V.
17.750	123.1920	0.15	Q	.	.	.	V.
17.833	123.1930	0.15	Q	.	.	.	V.
17.917	123.1940	0.14	Q	.	.	.	V.
18.000	123.1949	0.13	Q	.	.	.	V.

18.083	123.1958	0.13	Q	.	.	.	V.
18.167	123.1967	0.12	Q	.	.	.	V.
18.250	123.1975	0.12	Q	.	.	.	V.
18.333	123.1982	0.11	Q	.	.	.	V.
18.417	123.1990	0.11	Q	.	.	.	V.
18.500	123.1997	0.10	Q	.	.	.	V.
18.583	123.2003	0.10	Q	.	.	.	V.
18.667	123.2010	0.09	Q	.	.	.	V.
18.750	123.2016	0.09	Q	.	.	.	V.
18.833	123.2022	0.08	Q	.	.	.	V.
18.917	123.2027	0.08	Q	.	.	.	V.
19.000	123.2032	0.08	Q	.	.	.	V.
19.083	123.2038	0.07	Q	.	.	.	V.
19.167	123.2042	0.07	Q	.	.	.	V.
19.250	123.2047	0.07	Q	.	.	.	V.
19.333	123.2051	0.06	Q	.	.	.	V.
19.417	123.2056	0.06	Q	.	.	.	V.
19.500	123.2060	0.06	Q	.	.	.	V.
19.583	123.2063	0.06	Q	.	.	.	V.
19.667	123.2067	0.05	Q	.	.	.	V.
19.750	123.2071	0.05	Q	.	.	.	V.
19.833	123.2074	0.05	Q	.	.	.	V.
19.917	123.2077	0.05	Q	.	.	.	V.
20.000	123.2080	0.04	Q	.	.	.	V.
20.083	123.2083	0.04	Q	.	.	.	V.
20.167	123.2086	0.04	Q	.	.	.	V.
20.250	123.2088	0.04	Q	.	.	.	V.
20.333	123.2091	0.04	Q	.	.	.	V.
20.417	123.2093	0.03	Q	.	.	.	V.
20.500	123.2096	0.03	Q	.	.	.	V.
20.583	123.2098	0.03	Q	.	.	.	V.
20.667	123.2100	0.03	Q	.	.	.	V.
20.750	123.2102	0.03	Q	.	.	.	V.
20.833	123.2104	0.03	Q	.	.	.	V.
20.917	123.2106	0.03	Q	.	.	.	V.
21.000	123.2107	0.03	Q	.	.	.	V.
21.083	123.2109	0.02	Q	.	.	.	V.
21.167	123.2111	0.02	Q	.	.	.	V.
21.250	123.2112	0.02	Q	.	.	.	V.
21.333	123.2114	0.02	Q	.	.	.	V.
21.417	123.2115	0.02	Q	.	.	.	V.
21.500	123.2116	0.02	Q	.	.	.	V.
21.583	123.2118	0.02	Q	.	.	.	V.
21.667	123.2119	0.02	Q	.	.	.	V.
21.750	123.2120	0.02	Q	.	.	.	V.
21.833	123.2121	0.02	Q	.	.	.	V.
21.917	123.2122	0.02	Q	.	.	.	V.
22.000	123.2123	0.01	Q	.	.	.	V.
22.083	123.2124	0.01	Q	.	.	.	V.
22.167	123.2125	0.01	Q	.	.	.	V.
22.250	123.2126	0.01	Q	.	.	.	V.
22.333	123.2127	0.01	Q	.	.	.	V.
22.417	123.2127	0.01	Q	.	.	.	V.
22.500	123.2128	0.01	Q	.	.	.	V.
22.583	123.2129	0.01	Q	.	.	.	V.
22.667	123.2130	0.01	Q	.	.	.	V.
22.750	123.2130	0.01	Q	.	.	.	V.
22.833	123.2131	0.01	Q	.	.	.	V.
22.917	123.2131	0.01	Q	.	.	.	V.
23.000	123.2132	0.01	Q	.	.	.	V.
23.083	123.2132	0.01	Q	.	.	.	V.
23.167	123.2133	0.01	Q	.	.	.	V.
23.250	123.2134	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1395.0
10%	330.0
20%	215.0
30%	165.0
40%	125.0
50%	90.0
60%	65.0
70%	40.0
80%	25.0
90%	15.0

****
FLOW PROCESS FROM NODE 991.00 TO NODE 99.00 IS CODE = 4

>>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 312.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 2375.00
DOWNSTREAM ELEVATION(FT) = 2366.00
PIPE DIAMETER(FT) = 6.50

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	1.44	0.50	0.00	0.000
0.167	7.06	2.21	3.74	0.000
0.250	25.80	8.09	27.13	0.000
0.333	42.28	13.25	42.40	0.000
0.417	47.68	14.16	47.50	0.000
0.500	57.46	14.81	56.93	0.000
0.583	70.76	15.69	70.11	0.000
0.667	78.62	16.22	78.27	0.000
0.750	87.14	16.78	86.78	0.000
0.833	95.55	17.24	95.19	0.000
0.917	100.17	17.48	99.97	0.000
1.000	105.05	17.73	104.85	0.000
1.083	114.65	18.22	114.27	0.000
1.167	129.17	18.96	128.63	0.000
1.250	143.43	19.57	142.90	0.000

1.333	154.17	19.99	153.77	0.000
1.417	162.89	20.34	162.58	0.000
1.500	177.88	20.92	177.37	0.000
1.583	194.17	21.44	193.59	0.000
1.667	205.90	21.80	205.50	0.000
1.750	220.45	22.26	219.97	0.000
1.833	241.34	22.87	240.67	0.000
1.917	258.94	23.38	258.39	0.000
2.000	270.64	23.68	270.28	0.000
2.083	284.06	23.94	283.61	0.000
2.167	309.61	24.43	308.77	0.000
2.250	353.57	25.31	352.22	0.000
2.333	398.68	26.00	397.26	0.000
2.417	432.54	26.61	431.58	0.000
2.500	496.64	27.59	494.83	0.000
2.583	578.69	28.44	576.25	0.000
2.667	649.32	29.22	647.37	0.000
2.750	662.62	29.34	662.24	0.000
2.833	612.25	28.85	613.67	0.000
2.917	557.30	28.25	558.85	0.000
3.000	520.82	27.88	521.91	0.000
3.083	486.06	27.45	487.07	0.000
3.167	452.68	26.95	453.63	0.000
3.250	426.17	26.49	426.91	0.000
3.333	405.37	26.11	405.96	0.000
3.417	387.98	25.84	388.51	0.000
3.500	371.55	25.59	372.06	0.000
3.583	356.15	25.36	356.64	0.000
3.667	341.50	25.07	341.94	0.000
3.750	326.89	24.78	327.34	0.000
3.833	310.83	24.46	311.34	0.000
3.917	292.93	24.11	293.52	0.000
4.000	274.71	23.76	275.32	0.000
4.083	257.20	23.33	257.76	0.000
4.167	240.82	22.85	241.33	0.000
4.250	225.09	22.40	225.60	0.000
4.333	210.00	21.93	210.50	0.000
4.417	195.18	21.47	195.68	0.000
4.500	180.13	21.00	180.66	0.000
4.583	163.36	20.35	163.93	0.000
4.667	147.10	19.72	147.69	0.000
4.750	134.90	19.24	135.37	0.000
4.833	127.18	18.86	127.46	0.000
4.917	121.58	18.57	121.79	0.000
5.000	116.53	18.31	116.72	0.000
5.083	111.66	18.06	111.85	0.000
5.167	106.92	17.82	107.11	0.000
5.250	102.24	17.58	102.43	0.000
5.333	97.68	17.35	97.87	0.000
5.417	93.34	17.13	93.52	0.000
5.500	89.17	16.91	89.35	0.000
5.583	85.17	16.65	85.33	0.000
5.667	81.34	16.40	81.50	0.000
5.750	77.68	16.15	77.84	0.000
5.833	74.18	15.92	74.34	0.000
5.917	70.84	15.70	71.00	0.000
6.000	67.60	15.48	67.76	0.000
6.083	64.53	15.28	64.68	0.000
6.167	61.63	15.09	61.77	0.000
6.250	58.86	14.90	59.00	0.000
6.333	56.21	14.73	56.35	0.000
6.417	53.68	14.56	53.82	0.000
6.500	51.27	14.40	51.40	0.000

6.583	48.94	14.25	49.07	0.000
6.667	46.73	14.10	46.86	0.000
6.750	44.63	13.96	44.75	0.000
6.833	42.62	13.36	42.63	0.000
6.917	40.70	12.76	40.70	0.000
7.000	38.87	12.18	38.87	0.000
7.083	37.12	11.63	37.12	0.000
7.167	35.45	11.11	35.45	0.000
7.250	33.52	10.50	33.52	0.000
7.333	31.83	9.98	31.83	0.000
7.417	30.39	9.53	30.39	0.000
7.500	29.01	9.09	29.01	0.000
7.583	27.70	8.68	27.70	0.000
7.667	26.45	8.29	26.45	0.000
7.750	25.25	7.91	25.25	0.000
7.833	24.10	7.55	24.10	0.000
7.917	23.01	7.21	23.01	0.000
8.000	21.97	6.89	21.97	0.000
8.083	20.97	6.57	20.97	0.000
8.167	20.02	6.28	20.02	0.000
8.250	19.12	5.99	19.12	0.000
8.333	18.25	5.72	18.25	0.000
8.417	17.42	5.46	17.42	0.000
8.500	16.63	5.21	16.63	0.000
8.583	15.88	4.98	15.88	0.000
8.667	15.52	4.86	15.52	0.000
8.750	14.74	4.62	14.74	0.000
8.833	13.79	4.32	13.79	0.000
8.917	13.17	4.13	13.17	0.000
9.000	12.57	3.94	12.57	0.000
9.083	12.00	3.76	12.00	0.000
9.167	11.46	3.59	11.46	0.000
9.250	10.94	3.43	10.94	0.000
9.333	10.44	3.27	10.44	0.000
9.417	9.97	3.12	9.97	0.000
9.500	9.52	2.98	9.52	0.000
9.583	9.09	2.85	9.09	0.000
9.667	8.67	2.72	8.67	0.000
9.750	8.28	2.60	8.28	0.000
9.833	7.91	2.48	7.91	0.000
9.917	7.55	2.37	7.55	0.000
10.000	7.59	2.38	7.59	0.000
10.083	7.11	2.23	7.11	0.000
10.167	6.54	2.05	6.54	0.000
10.250	6.24	1.96	6.24	0.000
10.333	5.96	1.87	5.96	0.000
10.417	5.69	1.78	5.69	0.000
10.500	5.43	1.70	5.43	0.000
10.583	5.19	1.63	5.19	0.000
10.667	4.95	1.55	4.95	0.000
10.750	4.73	1.48	4.73	0.000
10.833	5.06	1.59	5.06	0.000
10.917	4.37	1.37	4.37	0.000
11.000	4.09	1.28	4.09	0.000
11.083	3.90	1.22	3.90	0.000
11.167	3.72	1.17	3.72	0.000
11.250	3.56	1.11	3.56	0.000
11.333	3.39	1.06	3.39	0.000
11.417	3.66	1.15	3.66	0.000
11.500	3.29	1.03	3.32	0.000
11.583	2.93	0.92	3.27	0.000
11.667	2.79	0.88	2.56	0.000
11.750	2.67	0.84	2.66	0.000

11.833	2.55	0.80	2.54	0.000
11.917	2.96	0.93	2.43	0.000
12.000	2.40	0.75	3.38	0.000
12.083	2.19	0.69	1.83	0.000
12.167	2.09	0.65	1.98	0.000
12.250	1.99	0.62	1.99	0.000
12.333	2.48	0.78	1.90	0.000
12.417	1.85	0.58	2.96	0.000
12.500	1.71	0.54	1.22	0.000
12.583	1.63	0.51	1.56	0.000
12.667	1.93	0.60	1.61	0.000
12.750	1.73	0.54	2.11	0.000
12.833	1.46	0.50	1.59	0.000
12.917	1.36	0.50	1.59	0.000
13.000	1.61	0.51	1.34	0.000
13.083	1.44	0.50	1.37	0.000
13.167	1.27	0.50	1.63	0.000
13.250	1.15	0.50	1.42	0.000
13.333	1.38	0.50	1.28	0.000
13.417	1.25	0.50	1.16	0.000
13.500	0.93	0.50	1.36	0.000
13.583	1.13	0.50	1.26	0.000
13.667	1.26	0.50	0.96	0.000
13.750	1.18	0.50	1.11	0.000
13.833	1.36	0.50	1.25	0.000
13.917	1.30	0.50	1.19	0.000
14.000	1.24	0.50	1.35	0.000
14.083	1.19	0.50	1.31	0.000
14.167	1.13	0.50	1.25	0.000
14.250	1.08	0.50	1.19	0.000
14.333	1.03	0.50	1.14	0.000
14.417	0.98	0.50	1.08	0.000
14.500	0.94	0.50	1.04	0.000
14.583	0.90	0.50	0.99	0.000
14.667	0.86	0.50	0.94	0.000
14.750	0.82	0.50	0.90	0.000
14.833	0.78	0.50	0.86	0.000
14.917	0.75	0.50	0.82	0.000
15.000	0.71	0.50	0.78	0.000
15.083	0.68	0.50	0.75	0.000
15.167	0.65	0.50	0.71	0.000
15.250	0.62	0.50	0.68	0.000
15.333	0.59	0.50	0.65	0.000
15.417	0.56	0.50	0.62	0.000
15.500	0.54	0.50	0.59	0.000
15.583	0.51	0.50	0.57	0.000
15.667	0.49	0.50	0.54	0.000
15.750	0.47	0.50	0.52	0.000
15.833	0.45	0.50	0.49	0.000
15.917	0.43	0.50	0.47	0.000
16.000	0.41	0.50	0.45	0.000
16.083	0.39	0.50	0.43	0.000
16.167	0.37	0.50	0.41	0.000
16.250	0.36	0.50	0.39	0.000
16.333	0.34	0.50	0.37	0.000
16.417	0.32	0.50	0.36	0.000
16.500	0.31	0.50	0.34	0.000
16.583	0.29	0.50	0.32	0.000
16.667	0.28	0.50	0.31	0.000
16.750	0.27	0.50	0.30	0.000
16.833	0.26	0.50	0.28	0.000
16.917	0.25	0.50	0.27	0.000
17.000	0.23	0.50	0.26	0.000

17.083	0.22	0.50	0.25	0.000
17.167	0.21	0.50	0.23	0.000
17.250	0.20	0.50	0.22	0.000
17.333	0.19	0.50	0.21	0.000
17.417	0.19	0.50	0.20	0.000
17.500	0.18	0.50	0.20	0.000
17.583	0.17	0.50	0.19	0.000
17.667	0.16	0.50	0.18	0.000
17.750	0.15	0.50	0.17	0.000
17.833	0.15	0.50	0.16	0.000
17.917	0.14	0.50	0.15	0.000
18.000	0.13	0.50	0.15	0.000
18.083	0.13	0.50	0.14	0.000
18.167	0.12	0.50	0.13	0.000
18.250	0.12	0.50	0.13	0.000
18.333	0.11	0.50	0.12	0.000
18.417	0.11	0.50	0.12	0.000
18.500	0.10	0.50	0.11	0.000
18.583	0.10	0.50	0.11	0.000
18.667	0.09	0.50	0.10	0.000
18.750	0.09	0.50	0.10	0.000
18.833	0.08	0.50	0.09	0.000
18.917	0.08	0.50	0.09	0.000
19.000	0.08	0.50	0.08	0.000
19.083	0.07	0.50	0.08	0.000
19.167	0.07	0.50	0.08	0.000
19.250	0.07	0.50	0.07	0.000
19.333	0.06	0.50	0.07	0.000
19.417	0.06	0.50	0.07	0.000
19.500	0.06	0.50	0.06	0.000
19.583	0.06	0.50	0.06	0.000
19.667	0.05	0.50	0.06	0.000
19.750	0.05	0.50	0.06	0.000
19.833	0.05	0.50	0.05	0.000
19.917	0.05	0.50	0.05	0.000
20.000	0.04	0.50	0.05	0.000
20.083	0.04	0.50	0.05	0.000
20.167	0.04	0.50	0.04	0.000
20.250	0.04	0.50	0.04	0.000
20.333	0.04	0.50	0.04	0.000
20.417	0.03	0.50	0.04	0.000
20.500	0.03	0.50	0.04	0.000
20.583	0.03	0.50	0.04	0.000
20.667	0.03	0.50	0.03	0.000
20.750	0.03	0.50	0.03	0.000
20.833	0.03	0.50	0.03	0.000
20.917	0.03	0.50	0.03	0.000
21.000	0.03	0.50	0.03	0.000
21.083	0.02	0.50	0.03	0.000
21.167	0.02	0.50	0.03	0.000
21.250	0.02	0.50	0.02	0.000
21.333	0.02	0.50	0.02	0.000
21.417	0.02	0.50	0.02	0.000
21.500	0.02	0.50	0.02	0.000
21.583	0.02	0.50	0.02	0.000
21.667	0.02	0.50	0.02	0.000
21.750	0.02	0.50	0.02	0.000
21.833	0.02	0.50	0.02	0.000
21.917	0.02	0.50	0.02	0.000
22.000	0.01	0.50	0.02	0.000
22.083	0.01	0.50	0.02	0.000
22.167	0.01	0.50	0.01	0.000
22.250	0.01	0.50	0.01	0.000

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          22.333      0.01      0.50      0.01        0.000
          22.417      0.01      0.50      0.01        0.000
          22.500      0.01      0.50      0.01        0.000
          22.583      0.01      0.50      0.01        0.000
          22.667      0.01      0.50      0.01        0.000
          22.750      0.01      0.50      0.01        0.000
          22.833      0.01      0.50      0.01        0.000
          22.917      0.01      0.50      0.01        0.000
          23.000      0.01      0.50      0.01        0.000
          23.083      0.01      0.50      0.01        0.000
          23.167      0.01      0.50      0.01        0.000
          23.250      0.01      0.50      0.01        0.000
          23.333      0.01      0.50      0.01        0.000
          23.417      0.01      0.50      0.01        0.000
          23.500      0.01      0.50      0.01        0.000
          23.583      0.01      0.50      0.01        0.000
          23.667      0.01      0.50      0.01        0.000
          23.750      0.01      0.50      0.01        0.000
          23.833      0.01      0.50      0.01        0.000
          23.917      0.00      0.50      0.01        0.000
          24.000      0.00      0.50      0.01        0.000


****************************************************************************
  FLOW PROCESS FROM NODE     99.00 TO NODE     99.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0000      0.00  Q         .         .         .         .
   0.167      0.0258      3.74  Q         .         .         .         .
   0.250      0.2126     27.13  VQ        .         .         .         .
   0.333      0.5046     42.40  V Q       .         .         .         .
   0.417      0.8317     47.50  V Q       .         .         .         .
   0.500      1.2238     56.93  V  Q      .         .         .         .
   0.583      1.7066     70.11  V   Q     .         .         .         .
   0.667      2.2457     78.27  V   Q     .         .         .         .
   0.750      2.8433     86.78  V   Q     .         .         .         .
   0.833      3.4989     95.19  .V   Q    .         .         .         .
   0.917      4.1874     99.97  .V   Q    .         .         .         .
   1.000      4.9095    104.85  .V   Q    .         .         .         .
   1.083      5.6964    114.27  .V    Q   .         .         .         .
   1.167      6.5823    128.63  . V    Q  .         .         .         .
   1.250      7.5665    142.90  . V     Q .         .         .         .
   1.333      8.6255    153.77  . V     Q .         .         .         .
   1.417      9.7452    162.58  .  V     Q.         .         .         .
   1.500     10.9668    177.37  .  V      Q         .         .         .
   1.583     12.3000    193.59  .  V      .Q        .         .         .
   1.667     13.7153    205.50  .   V     .Q        .         .         .
   1.750     15.2302    219.97  .   V     . Q       .         .         .
   1.833     16.8877    240.67  .    V    .  Q      .         .         .
   1.917     18.6673    258.39  .     V   .   Q     .         .         .
   2.000     20.5287    270.28  .     V   .    Q    .         .         .
   2.083     22.4819    283.61  .      V  .     Q   .         .         .
   2.167     24.6085    308.77  .      V  .      Q  .         .         .
   2.250     27.0342    352.22  .       V .         Q         .         .
   2.333     29.7702    397.26  .        V.         . Q       .         .
   2.417     32.7425    431.58  .         V         .   Q     .         .
```

```
2.500     36.1505    494.83  .         .V        .       Q .         .
2.583     40.1192    576.25  .         .  V      .         . Q       .
2.667     44.5776    647.37  .         .   V     .         .     Q   .
2.750     49.1385    662.24  .         .    V    .         .      Q  .
2.833     53.3649    613.67  .         .      V  .         .    Q    .
2.917     57.2137    558.85  .         .       V .         .Q        .
3.000     60.8081    521.91  .         .        V.        Q.         .
3.083     64.1626    487.07  .         .         V      Q  .         .
3.167     67.2868    453.63  .         .         .V   Q    .         .
3.250     70.2269    426.91  .         .         . V Q     .         .
3.333     73.0228    405.96  .         .         .  Q      .         .
3.417     75.6985    388.51  .         .         . Q V     .         .
3.500     78.2609    372.06  .         .         .Q   V    .         .
3.583     80.7171    356.64  .         .         Q     V   .         .
3.667     83.0721    341.94  .         .        Q.     V   .         .
3.750     85.3265    327.34  .         .       Q .      V  .         .
3.833     87.4707    311.34  .         .      Q  .       V .         .
3.917     89.4921    293.52  .         .     Q   .        V.         .
4.000     91.3883    275.32  .         .    Q    .        V.         .
4.083     93.1635    257.76  .         .   Q     .         V         .
4.167     94.8255    241.33  .         .  Q      .         V         .
4.250     96.3792    225.60  .         . Q       .         .V        .
4.333     97.8289    210.50  .         . Q       .         .V        .
4.417     99.1766    195.68  .         .Q        .         . V       .
4.500    100.4208    180.66  .         Q         .         . V       .
4.583    101.5498    163.93  .        Q.         .         . V       .
4.667    102.5669    147.69  .       Q .         .         .  V      .
4.750    103.4992    135.37  .      Q  .         .         .  V      .
4.833    104.3771    127.46  .      Q  .         .         .  V      .
4.917    105.2158    121.79  .     Q   .         .         .   V     .
5.000    106.0197    116.72  .     Q   .         .         .   V     .
5.083    106.7900    111.85  .     Q   .         .         .   V     .
5.167    107.5276    107.11  .     Q   .         .         .   V     .
5.250    108.2331    102.43  .    Q    .         .         .    V    .
5.333    108.9071     97.87  .    Q    .         .         .    V    .
5.417    109.5512     93.52  .    Q    .         .         .    V    .
5.500    110.1666     89.35  .    Q    .         .         .    V    .
5.583    110.7542     85.33  .   Q     .         .         .    V    .
5.667    111.3155     81.50  .   Q     .         .         .     V   .
5.750    111.8516     77.84  .   Q     .         .         .     V   .
5.833    112.3635     74.34  .   Q     .         .         .     V   .
5.917    112.8525     71.00  .   Q     .         .         .     V   .
6.000    113.3191     67.76  .  Q      .         .         .     V   .
6.083    113.7646     64.68  .  Q      .         .         .     V   .
6.167    114.1900     61.77  .  Q      .         .         .      V  .
6.250    114.5963     59.00  .  Q      .         .         .      V  .
6.333    114.9844     56.35  .  Q      .         .         .      V  .
6.417    115.3550     53.82  .  Q      .         .         .      V  .
6.500    115.7090     51.40  . Q       .         .         .      V  .
6.583    116.0470     49.07  . Q       .         .         .      V  .
6.667    116.3697     46.86  . Q       .         .         .      V  .
6.750    116.6779     44.75  . Q       .         .         .      V  .
6.833    116.9715     42.63  . Q       .         .         .      V  .
6.917    117.2518     40.70  . Q       .         .         .       V .
7.000    117.5195     38.87  . Q       .         .         .       V .
7.083    117.7751     37.12  . Q       .         .         .       V .
7.167    118.0193     35.45  . Q       .         .         .       V .
7.250    118.2501     33.52  .Q        .         .         .       V .
7.333    118.4694     31.83  .Q        .         .         .       V .
7.417    118.6787     30.39  .Q        .         .         .       V .
7.500    118.8785     29.01  .Q        .         .         .       V .
7.583    119.0693     27.70  .Q        .         .         .       V .
7.667    119.2514     26.45  .Q        .         .         .       V .
```

```
   7.750    119.4253     25.25  .Q         .         .         .       V .
   7.833    119.5913     24.10  .Q         .         .         .       V .
   7.917    119.7498     23.01  .Q         .         .         .       V .
   8.000    119.9011     21.97  .Q         .         .         .       V .
   8.083    120.0455     20.97  .Q         .         .         .       V .
   8.167    120.1834     20.02  .Q         .         .         .        V.
   8.250    120.3151     19.12  .Q         .         .         .        V.
   8.333    120.4408     18.25  .Q         .         .         .        V.
   8.417    120.5608     17.42  Q          .         .         .        V.
   8.500    120.6754     16.63  Q          .         .         .        V.
   8.583    120.7847     15.88  Q          .         .         .        V.
   8.667    120.8916     15.52  Q          .         .         .        V.
   8.750    120.9931     14.74  Q          .         .         .        V.
   8.833    121.0881     13.79  Q          .         .         .        V.
   8.917    121.1787     13.17  Q          .         .         .        V.
   9.000    121.2653     12.57  Q          .         .         .        V.
   9.083    121.3480     12.00  Q          .         .         .        V.
   9.167    121.4269     11.46  Q          .         .         .        V.
   9.250    121.5022     10.94  Q          .         .         .        V.
   9.333    121.5741     10.44  Q          .         .         .        V.
   9.417    121.6428      9.97  Q          .         .         .        V.
   9.500    121.7083      9.52  Q          .         .         .        V.
   9.583    121.7709      9.09  Q          .         .         .        V.
   9.667    121.8306      8.67  Q          .         .         .        V.
   9.750    121.8877      8.28  Q          .         .         .        V.
   9.833    121.9421      7.91  Q          .         .         .        V.
   9.917    121.9941      7.55  Q          .         .         .        V.
  10.000    122.0464      7.59  Q          .         .         .        V.
  10.083    122.0954      7.11  Q          .         .         .        V.
  10.167    122.1404      6.54  Q          .         .         .        V.
  10.250    122.1834      6.24  Q          .         .         .        V.
  10.333    122.2245      5.96  Q          .         .         .        V.
  10.417    122.2637      5.69  Q          .         .         .        V.
  10.500    122.3011      5.43  Q          .         .         .        V.
  10.583    122.3368      5.19  Q          .         .         .        V.
  10.667    122.3709      4.95  Q          .         .         .        V.
  10.750    122.4035      4.73  Q          .         .         .        V.
  10.833    122.4383      5.06  Q          .         .         .        V.
  10.917    122.4684      4.37  Q          .         .         .        V.
  11.000    122.4966      4.09  Q          .         .         .        V.
  11.083    122.5235      3.90  Q          .         .         .        V.
  11.167    122.5491      3.72  Q          .         .         .        V.
  11.250    122.5736      3.56  Q          .         .         .        V.
  11.333    122.5970      3.39  Q          .         .         .        V.
  11.417    122.6222      3.66  Q          .         .         .        V.
  11.500    122.6450      3.32  Q          .         .         .        V.
  11.583    122.6675      3.27  Q          .         .         .        V.
  11.667    122.6851      2.56  Q          .         .         .        V.
  11.750    122.7035      2.66  Q          .         .         .        V.
  11.833    122.7210      2.54  Q          .         .         .        V.
  11.917    122.7377      2.43  Q          .         .         .        V.
  12.000    122.7609      3.38  Q          .         .         .        V.
  12.083    122.7736      1.83  Q          .         .         .        V.
  12.167    122.7872      1.98  Q          .         .         .        V.
  12.250    122.8009      1.99  Q          .         .         .        V.
  12.333    122.8140      1.90  Q          .         .         .        V.
  12.417    122.8344      2.96  Q          .         .         .        V.
  12.500    122.8428      1.22  Q          .         .         .        V.
  12.583    122.8536      1.56  Q          .         .         .        V.
  12.667    122.8647      1.61  Q          .         .         .        V.
  12.750    122.8792      2.11  Q          .         .         .        V.
  12.833    122.8902      1.59  Q          .         .         .        V.
  12.917    122.9011      1.59  Q          .         .         .        V.
```

13.000	122.9103	1.34	Q	.	.	.	V.
13.083	122.9198	1.37	Q	.	.	.	V.
13.167	122.9310	1.63	Q	.	.	.	V.
13.250	122.9408	1.42	Q	.	.	.	V.
13.333	122.9496	1.28	Q	.	.	.	V.
13.417	122.9576	1.16	Q	.	.	.	V.
13.500	122.9669	1.36	Q	.	.	.	V.
13.583	122.9756	1.26	Q	.	.	.	V.
13.667	122.9822	0.96	Q	.	.	.	V.
13.750	122.9899	1.11	Q	.	.	.	V.
13.833	122.9985	1.25	Q	.	.	.	V.
13.917	123.0067	1.19	Q	.	.	.	V.
14.000	123.0160	1.35	Q	.	.	.	V.
14.083	123.0249	1.31	Q	.	.	.	V.
14.167	123.0335	1.25	Q	.	.	.	V.
14.250	123.0417	1.19	Q	.	.	.	V.
14.333	123.0495	1.14	Q	.	.	.	V.
14.417	123.0570	1.08	Q	.	.	.	V.
14.500	123.0641	1.04	Q	.	.	.	V.
14.583	123.0709	0.99	Q	.	.	.	V.
14.667	123.0774	0.94	Q	.	.	.	V.
14.750	123.0836	0.90	Q	.	.	.	V.
14.833	123.0896	0.86	Q	.	.	.	V.
14.917	123.0952	0.82	Q	.	.	.	V.
15.000	123.1006	0.78	Q	.	.	.	V.
15.083	123.1058	0.75	Q	.	.	.	V.
15.167	123.1107	0.71	Q	.	.	.	V.
15.250	123.1154	0.68	Q	.	.	.	V.
15.333	123.1199	0.65	Q	.	.	.	V.
15.417	123.1242	0.62	Q	.	.	.	V.
15.500	123.1283	0.59	Q	.	.	.	V.
15.583	123.1321	0.57	Q	.	.	.	V.
15.667	123.1359	0.54	Q	.	.	.	V.
15.750	123.1394	0.52	Q	.	.	.	V.
15.833	123.1428	0.49	Q	.	.	.	V.
15.917	123.1461	0.47	Q	.	.	.	V.
16.000	123.1492	0.45	Q	.	.	.	V.
16.083	123.1521	0.43	Q	.	.	.	V.
16.167	123.1549	0.41	Q	.	.	.	V.
16.250	123.1576	0.39	Q	.	.	.	V.
16.333	123.1602	0.37	Q	.	.	.	V.
16.417	123.1627	0.36	Q	.	.	.	V.
16.500	123.1650	0.34	Q	.	.	.	V.
16.583	123.1672	0.32	Q	.	.	.	V.
16.667	123.1694	0.31	Q	.	.	.	V.
16.750	123.1714	0.30	Q	.	.	.	V.
16.833	123.1734	0.28	Q	.	.	.	V.
16.917	123.1752	0.27	Q	.	.	.	V.
17.000	123.1770	0.26	Q	.	.	.	V.
17.083	123.1787	0.25	Q	.	.	.	V.
17.167	123.1803	0.23	Q	.	.	.	V.
17.250	123.1818	0.22	Q	.	.	.	V.
17.333	123.1833	0.21	Q	.	.	.	V.
17.417	123.1847	0.20	Q	.	.	.	V.
17.500	123.1861	0.20	Q	.	.	.	V.
17.583	123.1873	0.19	Q	.	.	.	V.
17.667	123.1886	0.18	Q	.	.	.	V.
17.750	123.1897	0.17	Q	.	.	.	V.
17.833	123.1908	0.16	Q	.	.	.	V.
17.917	123.1919	0.15	Q	.	.	.	V.
18.000	123.1929	0.15	Q	.	.	.	V.
18.083	123.1939	0.14	Q	.	.	.	V.
18.167	123.1948	0.13	Q	.	.	.	V.

18.250	123.1957	0.13	Q	.	.	.	V.
18.333	123.1966	0.12	Q	.	.	.	V.
18.417	123.1974	0.12	Q	.	.	.	V.
18.500	123.1981	0.11	Q	.	.	.	V.
18.583	123.1989	0.11	Q	.	.	.	V.
18.667	123.1996	0.10	Q	.	.	.	V.
18.750	123.2002	0.10	Q	.	.	.	V.
18.833	123.2009	0.09	Q	.	.	.	V.
18.917	123.2015	0.09	Q	.	.	.	V.
19.000	123.2021	0.08	Q	.	.	.	V.
19.083	123.2026	0.08	Q	.	.	.	V.
19.167	123.2032	0.08	Q	.	.	.	V.
19.250	123.2037	0.07	Q	.	.	.	V.
19.333	123.2042	0.07	Q	.	.	.	V.
19.417	123.2046	0.07	Q	.	.	.	V.
19.500	123.2051	0.06	Q	.	.	.	V.
19.583	123.2055	0.06	Q	.	.	.	V.
19.667	123.2059	0.06	Q	.	.	.	V.
19.750	123.2063	0.06	Q	.	.	.	V.
19.833	123.2066	0.05	Q	.	.	.	V.
19.917	123.2070	0.05	Q	.	.	.	V.
20.000	123.2073	0.05	Q	.	.	.	V.
20.083	123.2076	0.05	Q	.	.	.	V.
20.167	123.2080	0.04	Q	.	.	.	V.
20.250	123.2082	0.04	Q	.	.	.	V.
20.333	123.2085	0.04	Q	.	.	.	V.
20.417	123.2088	0.04	Q	.	.	.	V.
20.500	123.2090	0.04	Q	.	.	.	V.
20.583	123.2093	0.04	Q	.	.	.	V.
20.667	123.2095	0.03	Q	.	.	.	V.
20.750	123.2097	0.03	Q	.	.	.	V.
20.833	123.2099	0.03	Q	.	.	.	V.
20.917	123.2101	0.03	Q	.	.	.	V.
21.000	123.2103	0.03	Q	.	.	.	V.
21.083	123.2105	0.03	Q	.	.	.	V.
21.167	123.2107	0.03	Q	.	.	.	V.
21.250	123.2109	0.02	Q	.	.	.	V.
21.333	123.2110	0.02	Q	.	.	.	V.
21.417	123.2112	0.02	Q	.	.	.	V.
21.500	123.2113	0.02	Q	.	.	.	V.
21.583	123.2115	0.02	Q	.	.	.	V.
21.667	123.2116	0.02	Q	.	.	.	V.
21.750	123.2117	0.02	Q	.	.	.	V.
21.833	123.2118	0.02	Q	.	.	.	V.
21.917	123.2120	0.02	Q	.	.	.	V.
22.000	123.2121	0.02	Q	.	.	.	V.
22.083	123.2122	0.02	Q	.	.	.	V.
22.167	123.2123	0.01	Q	.	.	.	V.
22.250	123.2124	0.01	Q	.	.	.	V.
22.333	123.2125	0.01	Q	.	.	.	V.
22.417	123.2125	0.01	Q	.	.	.	V.
22.500	123.2126	0.01	Q	.	.	.	V.
22.583	123.2127	0.01	Q	.	.	.	V.
22.667	123.2128	0.01	Q	.	.	.	V.
22.750	123.2128	0.01	Q	.	.	.	V.
22.833	123.2129	0.01	Q	.	.	.	V.
22.917	123.2130	0.01	Q	.	.	.	V.
23.000	123.2130	0.01	Q	.	.	.	V.
23.083	123.2131	0.01	Q	.	.	.	V.
23.167	123.2132	0.01	Q	.	.	.	V.
23.250	123.2132	0.01	Q	.	.	.	V.
23.333	123.2133	0.01	Q	.	.	.	V.
23.417	123.2133	0.01	Q	.	.	.	V.

```
---------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated               Duration
       Peak Flow Rate                    (minutes)
   =======================               =========
             0%                           1405.0
            10%                            330.0
            20%                            215.0
            30%                            165.0
            40%                            125.0
            50%                             90.0
            60%                             60.0
            70%                             40.0
            80%                             25.0
            90%                             15.0
 ============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

APPENDIX B.3
CALIMESA CHANNEL HYDROLOGY
ULTIMATE CONDITION WITHOUT FLOW SPLIT

SYNTETIC UNIT HYDROGRAPH METHOD

```
____________________________________________________________________________
****************************************************************************

              F L O O D   R O U T I N G   A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                     (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2016 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 23.0)
                 Release Date: 07/01/2016  License ID 1670

                           Analysis prepared by:

                            TKE Engineering, Inc.
                              2305 Chicago Ave.
                             Riverside, Ca. 92507


 ************************** DESCRIPTION OF STUDY **************************
* FLOW ROUTING WITH 53.1 AC-FT RETARDING BASIN - 2-42IN RCP OUTLET         *
* WITH NO FLOW SPLIT AT NODE 994                                           *
*                                                                          *
 **************************************************************************

  FILE NAME: CCRRT3.DAT
  TIME/DATE OF STUDY: 07:54 04/13/2018


****************************************************************************
  FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =   11398.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    4724.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =     384.000 FEET
         BASIN FACTOR = 0.025
         WATERSHED AREA =     591.100 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         WATERCOURSE "LAG" TIME =    0.288 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.162
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9977


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  28.944


============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	2.730	195.148
2	12.324	685.851
3	29.998	1263.438
4	50.257	1448.231
5	63.405	939.943
6	71.104	550.332
7	76.269	369.261
8	80.138	276.581
9	83.186	217.857
10	85.669	177.537
11	87.692	144.576
12	89.400	122.071
13	90.875	105.449
14	92.160	91.918
15	93.248	77.735
16	94.250	71.609
17	95.105	61.175
18	95.927	58.764
19	96.533	43.327
20	97.095	40.172
21	97.658	40.183
22	98.079	30.139
23	98.289	14.992
24	98.497	14.857
25	98.704	14.838
26	98.912	14.857
27	99.120	14.858
28	99.328	14.857
29	99.536	14.857
30	99.743	14.857
31	99.951	14.857
32	100.000	3.486

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0135	0.0157
2	0.0292	0.0135	0.0157
3	0.0247	0.0123	0.0123
4	0.0337	0.0135	0.0202
5	0.0337	0.0135	0.0202
6	0.0404	0.0135	0.0269
7	0.0337	0.0135	0.0202
8	0.0404	0.0135	0.0269
9	0.0404	0.0135	0.0269
10	0.0337	0.0135	0.0202
11	0.0359	0.0135	0.0224
12	0.0404	0.0135	0.0269
13	0.0494	0.0135	0.0359
14	0.0494	0.0135	0.0359
15	0.0494	0.0135	0.0359
16	0.0449	0.0135	0.0314
17	0.0584	0.0135	0.0449
18	0.0606	0.0135	0.0471
19	0.0539	0.0135	0.0404
20	0.0606	0.0135	0.0471
21	0.0741	0.0135	0.0606
22	0.0696	0.0135	0.0561
23	0.0651	0.0135	0.0516
24	0.0673	0.0135	0.0538
25	0.0696	0.0135	0.0561
26	0.0943	0.0135	0.0808
27	0.1122	0.0135	0.0987
28	0.0786	0.0135	0.0651
29	0.1526	0.0135	0.1391
30	0.1639	0.0135	0.1504
31	0.1841	0.0135	0.1706
32	0.1324	0.0135	0.1189
33	0.0449	0.0135	0.0314
34	0.0404	0.0135	0.0269
35	0.0404	0.0135	0.0269
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.24
TOTAL SOIL-LOSS(INCHES) = 0.48
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.77

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 23.5634
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 86.9650

```
============================================================================

                    3 - H O U R   S T O R M
              R U N O F F   H Y D R O G R A P H

============================================================================
              HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      225.0     450.0     675.0     900.0
----------------------------------------------------------------------------
   0.083      0.0211      3.06  Q         .         .         .         .
   0.167      0.1162     13.81  Q         .         .         .         .
   0.250      0.3432     32.96  VQ        .         .         .         .
   0.333      0.7213     54.90  V Q       .         .         .         .
   0.417      1.2089     70.79  V  Q      .         .         .         .
   0.500      1.7997     85.79  V  Q      .         .         .         .
   0.583      2.5096    103.08  .V  Q     .         .         .         .
   0.667      3.3232    118.13  .V   Q    .         .         .         .
   0.750      4.2218    130.48  .V   Q    .         .         .         .
   0.833      5.1791    139.00  . V   Q   .         .         .         .
   0.917      6.1823    145.65  . V   Q   .         .         .         .
   1.000      7.1995    147.70  .  V  Q   .         .         .         .
   1.083      8.2411    151.25  .  V  Q   .         .         .         .
   1.167      9.3724    164.26  .   V  Q  .         .         .         .
   1.250     10.6391    183.92  .   V   Q .         .         .         .
   1.333     12.0296    201.91  .    V  Q .         .         .         .
   1.417     13.5021    213.79  .     V  Q.         .         .         .
   1.500     15.0565    225.70  .     V   Q         .         .         .
   1.583     16.7236    242.06  .      V  Q         .         .         .
   1.667     18.5231    261.29  .       V .Q        .         .         .
   1.750     20.4325    277.25  .        V. Q       .         .         .
   1.833     22.4654    295.17  .         V  Q      .         .         .
   1.917     24.6621    318.96  .         .V  Q     .         .         .
   2.000     26.9924    338.36  .         . V  Q    .         .         .
   2.083     29.3798    346.65  .         .  V Q    .         .         .
   2.167     31.8378    356.90  .         .   VQ    .         .         .
   2.250     34.4905    385.17  .         .    V Q  .         .         .
   2.333     37.4523    430.06  .         .      V Q.         .         .
   2.417     40.7988    485.90  .         .       V .Q        .         .
   2.500     44.5868    550.03  .         .         V   Q     .         .
   2.583     48.9979    640.49  .         .         . V     Q .         .
   2.667     54.2050    756.07  .         .         .   V     .  Q      .
   2.750     59.8003    812.44  .         .         .      V  .     Q   .
   2.833     65.0824    766.97  .         .         .        V.   Q     .
   2.917     69.4326    631.64  .         .         .       Q .V        .
   3.000     72.7611    483.31  .         .         .Q        .  V      .
   3.083     75.3689    378.65  .         .     Q   .         .   V     .
   3.167     77.4312    299.44  .         .  Q      .         .    V    .
   3.250     79.0191    230.55  .         Q         .         .     V   .
   3.333     80.2570    179.75  .      Q  .         .         .     V   .
   3.417     81.2620    145.93  .     Q   .         .         .      V  .
   3.500     82.1028    122.08  .    Q    .         .         .      V  .
   3.583     82.8171    103.71  .   Q     .         .         .       V .
   3.667     83.4310     89.15  .  Q      .         .         .       V .
   3.750     83.9590     76.66  .  Q      .         .         .       V .
   3.833     84.4211     67.10  . Q       .         .         .       V .
   3.917     84.8227     58.31  . Q       .         .         .        V.
   4.000     85.1672     50.01  . Q       .         .         .        V.
   4.083     85.4619     42.80  .Q        .         .         .        V.
   4.167     85.7153     36.79  .Q        .         .         .        V.
   4.250     85.9305     31.25  .Q        .         .         .        V.
   4.333     86.1078     25.74  .Q        .         .         .        V.
```

```
   4.417     86.2494     20.57  Q         .         .         .        V.
   4.500     86.3697     17.46  Q         .         .         .        V.
   4.583     86.4791     15.89  Q         .         .         .        V.
   4.667     86.5781     14.38  Q         .         .         .        V.
   4.750     86.6662     12.79  Q         .         .         .        V.
   4.833     86.7439     11.28  Q         .         .         .        V.
   4.917     86.8141     10.19  Q         .         .         .        V.
   5.000     86.8718      8.39  Q         .         .         .        V.
   5.083     86.9145      6.19  Q         .         .         .        V.
   5.167     86.9401      3.73  Q         .         .         .        V.
   5.250     86.9524      1.78  Q         .         .         .        V.
   5.333     86.9594      1.01  Q         .         .         .        V.
   5.417     86.9634      0.59  Q         .         .         .        V.
   5.500     86.9648      0.19  Q         .         .         .        V.
   5.583     86.9649      0.02  Q         .         .         .        V.
-------------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   =======================                =========
             0%                             335.0
            10%                             195.0
            20%                             135.0
            30%                              95.0
            40%                              70.0
            50%                              45.0
            60%                              30.0
            70%                              25.0
            80%                              15.0
            90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    107.00 TO NODE   1062.00 IS CODE = 5.2
 ----------------------------------------------------------------------------
   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
 ============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    4.00     CHANNEL Z =  1.50
           UPSTREAM ELEVATION(FT) =    2478.00
           DOWNSTREAM ELEVATION(FT) =    2475.00
           CHANNEL LENGTH(FT) =     124.00     MANNING'S FACTOR = 0.015
           CONSTANT LOSS RATE(CFS) =    0.00


         CHANNEL ROUTING COEFFICIENT ESTIMATED:
           MAXIMUM INFLOW(CFS) =   812.44
           AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW =   617.43
           CHANNEL NORMAL VELOCITY FOR Q =   617.43 CFS =  22.62 FPS
           ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.930
```

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	3.06	3.01	3.01
0.167	13.81	13.63	13.63
0.250	32.96	32.64	32.64
0.333	54.90	54.53	54.53
0.417	70.79	70.52	70.52
0.500	85.79	85.54	85.54
0.583	103.08	102.78	102.78
0.667	118.13	117.88	117.88
0.750	130.48	130.27	130.27
0.833	139.00	138.86	138.86
0.917	145.65	145.54	145.54
1.000	147.70	147.66	147.66
1.083	151.25	151.19	151.19
1.167	164.26	164.04	164.04
1.250	183.92	183.59	183.59
1.333	201.91	201.60	201.60
1.417	213.79	213.59	213.59
1.500	225.70	225.50	225.50
1.583	242.06	241.78	241.78
1.667	261.29	260.96	260.96
1.750	277.25	276.98	276.98
1.833	295.17	294.86	294.86
1.917	318.96	318.56	318.56
2.000	338.36	338.03	338.03
2.083	346.65	346.51	346.51
2.167	356.90	356.73	356.73
2.250	385.17	384.69	384.69
2.333	430.06	429.30	429.30
2.417	485.90	484.95	484.95
2.500	550.03	548.94	548.94
2.583	640.49	638.95	638.95
2.667	756.07	754.11	754.11
2.750	812.44	811.48	811.48
2.833	766.97	767.74	767.74
2.917	631.64	633.94	633.94
3.000	483.31	485.83	485.83
3.083	378.65	380.43	380.43
3.167	299.44	300.79	300.79
3.250	230.55	231.72	231.72
3.333	179.75	180.61	180.61
3.417	145.93	146.50	146.50
3.500	122.08	122.49	122.49
3.583	103.71	104.02	104.02
3.667	89.15	89.40	89.40
3.750	76.66	76.88	76.88
3.833	67.10	67.26	67.26
3.917	58.31	58.46	58.46
4.000	50.01	50.15	50.15
4.083	42.80	42.92	42.92
4.167	36.79	36.90	36.90
4.250	31.25	31.34	31.34
4.333	25.74	25.83	25.83
4.417	20.57	20.66	20.66
4.500	17.46	17.51	17.51

```
          4.583         15.89       15.91       15.91
          4.667         14.38       14.41       14.41
          4.750         12.79       12.82       12.82
          4.833         11.28       11.30       11.30
          4.917         10.19       10.21       10.21
          5.000          8.39        8.42        8.42
          5.083          6.19        6.23        6.23
          5.167          3.73        3.77        3.77
          5.250          1.78        1.81        1.81
          5.333          1.01        1.02        1.02
          5.417          0.59        0.60        0.60
          5.500          0.19        0.20        0.20
          5.583          0.02        0.03        0.03
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     86.965 AF
    OUTFLOW VOLUME =     86.965 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      225.0     450.0     675.0     900.0
----------------------------------------------------------------------------
   0.083      0.0207      3.01  Q         .         .         .         .
   0.167      0.1145     13.63  Q         .         .         .         .
   0.250      0.3393     32.64  VQ        .         .         .         .
   0.333      0.7149     54.53  V Q       .         .         .         .
   0.417      1.2006     70.52  V  Q      .         .         .         .
   0.500      1.7897     85.54  V  Q      .         .         .         .
   0.583      2.4975    102.78  .V  Q     .         .         .         .
   0.667      3.3093    117.88  .V   Q    .         .         .         .
   0.750      4.2065    130.27  .V   Q    .         .         .         .
   0.833      5.1629    138.86  . V   Q   .         .         .         .
   0.917      6.1652    145.54  . V   Q   .         .         .         .
   1.000      7.1822    147.66  .  V  Q   .         .         .         .
   1.083      8.2234    151.19  .  V  Q   .         .         .         .
   1.167      9.3532    164.04  .   V  Q  .         .         .         .
   1.250     10.6176    183.59  .   V   Q .         .         .         .
   1.333     12.0060    201.60  .    V  Q .         .         .         .
   1.417     13.4770    213.59  .     V  Q.         .         .         .
   1.500     15.0301    225.50  .     V   Q         .         .         .
   1.583     16.6952    241.78  .      V  Q         .         .         .
   1.667     18.4925    260.96  .       V .Q        .         .         .
   1.750     20.4001    276.98  .        V. Q       .         .         .
   1.833     22.4308    294.86  .         V  Q      .         .         .
   1.917     24.6247    318.56  .         .V  Q     .         .         .
   2.000     26.9528    338.03  .         . V  Q    .         .         .
   2.083     29.3392    346.51  .         .  V Q    .         .         .
   2.167     31.7960    356.73  .         .   VQ    .         .         .
   2.250     34.4454    384.69  .         .    V Q  .         .         .
   2.333     37.4020    429.30  .         .      V Q.         .         .
   2.417     40.7419    484.95  .         .       V .Q        .         .
   2.500     44.5224    548.94  .         .         V  Q      .         .
   2.583     48.9229    638.95  .         .         . V   Q   .         .
   2.667     54.1165    754.11  .         .         .   V     .  Q      .
```

```
   2.750     59.7052    811.48  .         .         .      V  .     Q   .
   2.833     64.9927    767.74  .         .         .        V.   Q     .
   2.917     69.3586    633.94  .         .         .       Q .V        .
   3.000     72.7046    485.83  .         .         .Q         .  V     .
   3.083     75.3246    380.43  .         .     Q   .          .   V    .
   3.167     77.3962    300.79  .         .  Q      .          .    V   .
   3.250     78.9921    231.72  .         Q         .          .     V  .
   3.333     80.2360    180.61  .       Q .         .          .     V  .
   3.417     81.2450    146.50  .     Q   .         .          .      V .
   3.500     82.0885    122.49  .    Q    .         .          .      V .
   3.583     82.8049    104.02  .   Q     .         .          .       V .
   3.667     83.4206     89.40  .  Q      .         .          .       V .
   3.750     83.9501     76.88  .  Q      .         .          .       V .
   3.833     84.4133     67.26  . Q       .         .          .       V .
   3.917     84.8159     58.46  . Q       .         .          .        V.
   4.000     85.1613     50.15  . Q       .         .          .        V.
   4.083     85.4569     42.92  .Q        .         .          .        V.
   4.167     85.7110     36.90  .Q        .         .          .        V.
   4.250     85.9269     31.34  .Q        .         .          .        V.
   4.333     86.1048     25.83  .Q        .         .          .        V.
   4.417     86.2471     20.66  Q         .         .          .        V.
   4.500     86.3677     17.51  Q         .         .          .        V.
   4.583     86.4773     15.91  Q         .         .          .        V.
   4.667     86.5765     14.41  Q         .         .          .        V.
   4.750     86.6647     12.82  Q         .         .          .        V.
   4.833     86.7426     11.30  Q         .         .          .        V.
   4.917     86.8129     10.21  Q         .         .          .        V.
   5.000     86.8709      8.42  Q         .         .          .        V.
   5.083     86.9138      6.23  Q         .         .          .        V.
   5.167     86.9397      3.77  Q         .         .          .        V.
   5.250     86.9522      1.81  Q         .         .          .        V.
   5.333     86.9593      1.02  Q         .         .          .        V.
   5.417     86.9634      0.60  Q         .         .          .        V.
   5.500     86.9648      0.20  Q         .         .          .        V.
   5.583     86.9650      0.03  Q         .         .          .         V
   5.667     86.9650      0.00  Q         .         .          .         V
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
             0%                              340.0
            10%                              195.0
            20%                              135.0
            30%                               95.0
            40%                               70.0
            50%                               45.0
            60%                               30.0
            70%                               25.0
            80%                               15.0
            90%                               15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE   1062.00 TO NODE   1062.00 IS CODE = 3.1
 ----------------------------------------------------------------------------
   >>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
 ============================================================================
```

```
                INFLOW
              (STREAM 1)
                  |
                  |
                  V                 __effective depth
               -----------          |   (and volume)
              |           |    |    |
              |           |    |....V........
              | detention |<-->|           outflow
              |   basin   |    |.........________
               -----------     |    ^    |  \
                  |            |  dead   |   basin outlet
                  V            | storage |
               OUTFLOW          ---------
              (STREAM 1)
```

ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1
THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 12.250
SPECIFIED DEAD STORAGE(AF) FILLED = 12.250
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	4.00	134.00	19.910
3	5.00	175.00	22.000
4	10.00	307.00	33.560
5	14.00	380.00	44.230
6	15.00	397.00	47.110
7	16.00	1042.25	50.070
8	17.00	2101.22	53.120

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MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.083	12.250	3.01	0.00	0.00	0.1	0.020
0.167	12.250	13.63	0.00	0.02	0.4	0.111
0.250	12.250	32.64	0.00	0.07	1.5	0.326
0.333	12.250	54.53	0.00	0.14	3.4	0.678
0.417	12.250	70.52	0.00	0.23	6.1	1.122

0.500	12.250	85.54	0.00	0.33	9.3	1.647
0.583	12.250	102.78	0.00	0.45	13.2	2.264
0.667	12.250	117.88	0.00	0.59	17.6	2.955
0.750	12.250	130.27	0.00	0.74	22.4	3.698
0.833	12.250	138.86	0.00	0.90	27.5	4.465
0.917	12.250	145.54	0.00	1.05	32.7	5.242
1.000	12.250	147.66	0.00	1.21	37.8	5.999
1.083	12.250	151.19	0.00	1.36	42.9	6.745
1.167	12.250	164.04	0.00	1.52	48.1	7.543
1.250	12.250	183.59	0.00	1.70	53.8	8.437
1.333	12.250	201.60	0.00	1.89	60.1	9.412
1.417	12.250	213.59	0.00	2.09	66.8	10.424
1.500	12.250	225.50	0.00	2.30	73.7	11.469
1.583	12.250	241.78	0.00	2.53	80.9	12.577
1.667	12.250	260.96	0.00	2.77	88.6	13.764
1.750	12.250	276.98	0.00	3.01	96.8	15.005
1.833	12.250	294.86	0.00	3.28	105.4	16.310
1.917	12.250	318.56	0.00	3.56	114.5	17.715
2.000	12.250	338.03	0.00	3.85	124.2	19.188
2.083	12.250	346.51	0.00	4.34	138.5	20.620
2.167	12.250	356.73	0.00	4.98	161.1	21.967
2.250	12.250	384.69	0.00	5.59	182.4	23.360
2.333	12.250	429.30	0.00	6.27	199.6	24.942
2.417	12.250	484.95	0.00	7.06	219.1	26.774
2.500	12.250	548.94	0.00	7.98	241.6	28.890
2.583	12.250	638.95	0.00	9.08	268.3	31.443
2.667	12.250	754.11	0.00	10.38	298.4	34.582
2.750	12.250	811.48	0.00	11.64	325.4	37.929
2.833	12.250	767.74	0.00	12.72	346.8	40.828
2.917	12.250	633.94	0.00	13.42	363.1	42.693
3.000	12.250	485.83	0.00	13.72	372.2	43.476

3.083	12.250	380.43	0.00	13.73	375.0	43.514
3.167	12.250	300.79	0.00	13.54	373.4	43.014
3.250	12.250	231.72	0.00	13.19	368.5	42.072
3.333	12.250	180.61	0.00	12.73	361.0	40.830
3.417	12.250	146.50	0.00	12.20	351.9	39.415
3.500	12.250	122.49	0.00	11.63	341.9	37.904
3.583	12.250	104.02	0.00	11.04	331.4	36.338
3.667	12.250	89.40	0.00	10.44	320.6	34.746
3.750	12.250	76.88	0.00	9.82	308.7	33.150
3.833	12.250	67.26	0.00	9.15	293.4	31.592
3.917	12.250	58.46	0.00	8.50	276.0	30.094
4.000	12.250	50.15	0.00	7.88	259.2	28.654
4.083	12.250	42.92	0.00	7.28	243.1	27.276
4.167	12.250	36.90	0.00	6.71	227.7	25.961
4.250	12.250	31.34	0.00	6.17	213.1	24.710
4.333	12.250	25.83	0.00	5.66	199.1	23.516
4.417	12.250	20.66	0.00	5.16	185.8	22.379
4.500	12.250	17.51	0.00	4.68	170.5	21.325
4.583	12.250	15.91	0.00	4.23	152.5	20.384
4.667	12.250	14.41	0.00	3.93	137.4	19.537
4.750	12.250	12.82	0.00	3.76	128.8	18.738
4.833	12.250	11.30	0.00	3.61	123.5	17.965
4.917	12.250	10.21	0.00	3.46	118.4	17.220
5.000	12.250	8.42	0.00	3.31	113.5	16.497
5.083	12.250	6.23	0.00	3.17	108.7	15.791
5.167	12.250	3.77	0.00	3.03	104.0	15.101
5.250	12.250	1.81	0.00	2.90	99.4	14.429
5.333	12.250	1.02	0.00	2.77	94.9	13.783
5.417	12.250	0.60	0.00	2.64	90.7	13.162
5.500	12.250	0.20	0.00	2.52	86.6	12.567
5.583	12.250	0.03	0.00	2.41	82.7	11.998

5.667	12.250	0.00	0.00	2.30	78.9	11.455
5.750	12.250	0.00	0.00	2.20	75.3	10.936
5.833	12.250	0.00	0.00	2.10	71.9	10.440
5.917	12.250	0.00	0.00	2.00	68.7	9.967
6.000	12.250	0.00	0.00	1.91	65.6	9.516
6.083	12.250	0.00	0.00	1.83	62.6	9.085
6.167	12.250	0.00	0.00	1.74	59.8	8.673
6.250	12.250	0.00	0.00	1.66	57.1	8.280
6.333	12.250	0.00	0.00	1.59	54.5	7.905
6.417	12.250	0.00	0.00	1.52	52.0	7.547
6.500	12.250	0.00	0.00	1.45	49.6	7.205
6.583	12.250	0.00	0.00	1.38	47.4	6.879
6.667	12.250	0.00	0.00	1.32	45.2	6.567
6.750	12.250	0.00	0.00	1.26	43.2	6.270
6.833	12.250	0.00	0.00	1.20	41.2	5.986
6.917	12.250	0.00	0.00	1.15	39.4	5.714
7.000	12.250	0.00	0.00	1.10	37.6	5.456
7.083	12.250	0.00	0.00	1.05	35.9	5.208
7.167	12.250	0.00	0.00	1.00	34.3	4.972
7.250	12.250	0.00	0.00	0.95	32.7	4.747
7.333	12.250	0.00	0.00	0.91	31.2	4.532
7.417	12.250	0.00	0.00	0.87	29.8	4.327
7.500	12.250	0.00	0.00	0.83	28.5	4.131
7.583	12.250	0.00	0.00	0.79	27.2	3.944
7.667	12.250	0.00	0.00	0.76	25.9	3.765
7.750	12.250	0.00	0.00	0.72	24.8	3.594
7.833	12.250	0.00	0.00	0.69	23.6	3.432
7.917	12.250	0.00	0.00	0.66	22.6	3.276
8.000	12.250	0.00	0.00	0.63	21.5	3.128
8.083	12.250	0.00	0.00	0.60	20.6	2.986
8.167	12.250	0.00	0.00	0.57	19.6	2.851

8.250	12.250	0.00	0.00	0.55	18.8	2.722
8.333	12.250	0.00	0.00	0.52	17.9	2.598
8.417	12.250	0.00	0.00	0.50	17.1	2.481
8.500	12.250	0.00	0.00	0.48	16.3	2.368
8.583	12.250	0.00	0.00	0.45	15.6	2.261
8.667	12.250	0.00	0.00	0.43	14.9	2.159
8.750	12.250	0.00	0.00	0.41	14.2	2.061
8.833	12.250	0.00	0.00	0.40	13.6	1.967
8.917	12.250	0.00	0.00	0.38	12.9	1.878
9.000	12.250	0.00	0.00	0.36	12.4	1.793
9.083	12.250	0.00	0.00	0.34	11.8	1.712
9.167	12.250	0.00	0.00	0.33	11.3	1.634
9.250	12.250	0.00	0.00	0.31	10.8	1.560
9.333	12.250	0.00	0.00	0.30	10.3	1.490
9.417	12.250	0.00	0.00	0.29	9.8	1.422
9.500	12.250	0.00	0.00	0.27	9.4	1.358
9.583	12.250	0.00	0.00	0.26	8.9	1.296
9.667	12.250	0.00	0.00	0.25	8.5	1.238
9.750	12.250	0.00	0.00	0.24	8.1	1.181
9.833	12.250	0.00	0.00	0.23	7.8	1.128
9.917	12.250	0.00	0.00	0.22	7.4	1.077
10.000	12.250	0.00	0.00	0.21	7.1	1.028
10.083	12.250	0.00	0.00	0.20	6.8	0.981
10.167	12.250	0.00	0.00	0.19	6.5	0.937
10.250	12.250	0.00	0.00	0.18	6.2	0.895
10.333	12.250	0.00	0.00	0.17	5.9	0.854
10.417	12.250	0.00	0.00	0.16	5.6	0.815
10.500	12.250	0.00	0.00	0.16	5.4	0.778
10.583	12.250	0.00	0.00	0.15	5.1	0.743
10.667	12.250	0.00	0.00	0.14	4.9	0.709
10.750	12.250	0.00	0.00	0.14	4.7	0.677

10.833	12.250	0.00	0.00	0.13	4.5	0.647
10.917	12.250	0.00	0.00	0.12	4.3	0.617
11.000	12.250	0.00	0.00	0.12	4.1	0.589
11.083	12.250	0.00	0.00	0.11	3.9	0.563
11.167	12.250	0.00	0.00	0.11	3.7	0.537
11.250	12.250	0.00	0.00	0.10	3.5	0.513
11.333	12.250	0.00	0.00	0.10	3.4	0.490
11.417	12.250	0.00	0.00	0.09	3.2	0.467
11.500	12.250	0.00	0.00	0.09	3.1	0.446
11.583	12.250	0.00	0.00	0.09	2.9	0.426
11.667	12.250	0.00	0.00	0.08	2.8	0.407
11.750	12.250	0.00	0.00	0.08	2.7	0.388
11.833	12.250	0.00	0.00	0.07	2.6	0.371
11.917	12.250	0.00	0.00	0.07	2.4	0.354
12.000	12.250	0.00	0.00	0.07	2.3	0.338
12.083	12.250	0.00	0.00	0.06	2.2	0.323
12.167	12.250	0.00	0.00	0.06	2.1	0.308
12.250	12.250	0.00	0.00	0.06	2.0	0.294
12.333	12.250	0.00	0.00	0.06	1.9	0.281
12.417	12.250	0.00	0.00	0.05	1.8	0.268
12.500	12.250	0.00	0.00	0.05	1.8	0.256
12.583	12.250	0.00	0.00	0.05	1.7	0.244
12.667	12.250	0.00	0.00	0.05	1.6	0.233
12.750	12.250	0.00	0.00	0.04	1.5	0.223
12.833	12.250	0.00	0.00	0.04	1.5	0.213
12.917	12.250	0.00	0.00	0.04	1.4	0.203
13.000	12.250	0.00	0.00	0.04	1.3	0.194
13.083	12.250	0.00	0.00	0.04	1.3	0.185
13.167	12.250	0.00	0.00	0.04	1.2	0.177
13.250	12.250	0.00	0.00	0.03	1.2	0.169
13.333	12.250	0.00	0.00	0.03	1.1	0.161

13.417	12.250	0.00	0.00	0.03	1.1	0.154
13.500	12.250	0.00	0.00	0.03	1.0	0.147
13.583	12.250	0.00	0.00	0.03	1.0	0.140
13.667	12.250	0.00	0.00	0.03	0.9	0.134
13.750	12.250	0.00	0.00	0.03	0.9	0.128
13.833	12.250	0.00	0.00	0.02	0.8	0.122
13.917	12.250	0.00	0.00	0.02	0.8	0.116
14.000	12.250	0.00	0.00	0.02	0.8	0.111
14.083	12.250	0.00	0.00	0.02	0.7	0.106
14.167	12.250	0.00	0.00	0.02	0.7	0.101
14.250	12.250	0.00	0.00	0.02	0.7	0.097
14.333	12.250	0.00	0.00	0.02	0.6	0.092
14.417	12.250	0.00	0.00	0.02	0.6	0.088
14.500	12.250	0.00	0.00	0.02	0.6	0.084
14.583	12.250	0.00	0.00	0.02	0.6	0.080
14.667	12.250	0.00	0.00	0.02	0.5	0.077
14.750	12.250	0.00	0.00	0.01	0.5	0.073
14.833	12.250	0.00	0.00	0.01	0.5	0.070
14.917	12.250	0.00	0.00	0.01	0.5	0.067
15.000	12.250	0.00	0.00	0.01	0.4	0.064
15.083	12.250	0.00	0.00	0.01	0.4	0.061
15.167	12.250	0.00	0.00	0.01	0.4	0.058
15.250	12.250	0.00	0.00	0.01	0.4	0.055
15.333	12.250	0.00	0.00	0.01	0.4	0.053
15.417	12.250	0.00	0.00	0.01	0.3	0.051
15.500	12.250	0.00	0.00	0.01	0.3	0.048
15.583	12.250	0.00	0.00	0.01	0.3	0.046
15.667	12.250	0.00	0.00	0.01	0.3	0.044
15.750	12.250	0.00	0.00	0.01	0.3	0.042
15.833	12.250	0.00	0.00	0.01	0.3	0.040
15.917	12.250	0.00	0.00	0.01	0.3	0.038

16.000	12.250	0.00	0.00	0.01	0.3	0.037
16.083	12.250	0.00	0.00	0.01	0.2	0.035
16.167	12.250	0.00	0.00	0.01	0.2	0.033
16.250	12.250	0.00	0.00	0.01	0.2	0.032
16.333	12.250	0.00	0.00	0.01	0.2	0.030
16.417	12.250	0.00	0.00	0.01	0.2	0.029
16.500	12.250	0.00	0.00	0.01	0.2	0.028
16.583	12.250	0.00	0.00	0.01	0.2	0.026
16.667	12.250	0.00	0.00	0.01	0.2	0.025
16.750	12.250	0.00	0.00	0.00	0.2	0.024
16.833	12.250	0.00	0.00	0.00	0.2	0.023
16.917	12.250	0.00	0.00	0.00	0.2	0.022
17.000	12.250	0.00	0.00	0.00	0.1	0.021
17.083	12.250	0.00	0.00	0.00	0.1	0.020
17.167	12.250	0.00	0.00	0.00	0.1	0.019
17.250	12.250	0.00	0.00	0.00	0.1	0.018
17.333	12.250	0.00	0.00	0.00	0.1	0.017
17.417	12.250	0.00	0.00	0.00	0.1	0.017
17.500	12.250	0.00	0.00	0.00	0.1	0.016
17.583	12.250	0.00	0.00	0.00	0.1	0.015
17.667	12.250	0.00	0.00	0.00	0.1	0.014
17.750	12.250	0.00	0.00	0.00	0.1	0.014
17.833	12.250	0.00	0.00	0.00	0.1	0.013
17.917	12.250	0.00	0.00	0.00	0.1	0.013
18.000	12.250	0.00	0.00	0.00	0.1	0.012
18.083	12.250	0.00	0.00	0.00	0.1	0.011
18.167	12.250	0.00	0.00	0.00	0.1	0.011
18.250	12.250	0.00	0.00	0.00	0.1	0.010
18.333	12.250	0.00	0.00	0.00	0.1	0.010
18.417	12.250	0.00	0.00	0.00	0.1	0.010
18.500	12.250	0.00	0.00	0.00	0.1	0.009

18.583	12.250	0.00	0.00	0.00	0.1	0.009
18.667	12.250	0.00	0.00	0.00	0.1	0.008
18.750	12.250	0.00	0.00	0.00	0.1	0.008
18.833	12.250	0.00	0.00	0.00	0.1	0.008
18.917	12.250	0.00	0.00	0.00	0.0	0.007
19.000	12.250	0.00	0.00	0.00	0.0	0.007
19.083	12.250	0.00	0.00	0.00	0.0	0.007
19.167	12.250	0.00	0.00	0.00	0.0	0.006
19.250	12.250	0.00	0.00	0.00	0.0	0.006
19.333	12.250	0.00	0.00	0.00	0.0	0.006
19.417	12.250	0.00	0.00	0.00	0.0	0.005
19.500	12.250	0.00	0.00	0.00	0.0	0.005
19.583	12.250	0.00	0.00	0.00	0.0	0.005
19.667	12.250	0.00	0.00	0.00	0.0	0.005
19.750	12.250	0.00	0.00	0.00	0.0	0.005
19.833	12.250	0.00	0.00	0.00	0.0	0.004
19.917	12.250	0.00	0.00	0.00	0.0	0.004
20.000	12.250	0.00	0.00	0.00	0.0	0.004
20.083	12.250	0.00	0.00	0.00	0.0	0.004
20.167	12.250	0.00	0.00	0.00	0.0	0.004
20.250	12.250	0.00	0.00	0.00	0.0	0.003
20.333	12.250	0.00	0.00	0.00	0.0	0.003
20.417	12.250	0.00	0.00	0.00	0.0	0.003
20.500	12.250	0.00	0.00	0.00	0.0	0.003
20.583	12.250	0.00	0.00	0.00	0.0	0.003
20.667	12.250	0.00	0.00	0.00	0.0	0.003
20.750	12.250	0.00	0.00	0.00	0.0	0.003
20.833	12.250	0.00	0.00	0.00	0.0	0.002
20.917	12.250	0.00	0.00	0.00	0.0	0.002
21.000	12.250	0.00	0.00	0.00	0.0	0.002
21.083	12.250	0.00	0.00	0.00	0.0	0.002

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          21.167       12.250     0.00     0.00      0.00      0.0
0.002
          21.250       12.250     0.00     0.00      0.00      0.0
0.002
          21.333       12.250     0.00     0.00      0.00      0.0
0.002
          21.417       12.250     0.00     0.00      0.00      0.0
0.002
          21.500       12.250     0.00     0.00      0.00      0.0
0.002
          21.583       12.250     0.00     0.00      0.00      0.0
0.002
          21.667       12.250     0.00     0.00      0.00      0.0
0.002
          21.750       12.250     0.00     0.00      0.00      0.0
0.001
          21.833       12.250     0.00     0.00      0.00      0.0
0.001
          21.917       12.250     0.00     0.00      0.00      0.0
0.001
 ----------------------------------------------------------------------------
   PROCESS SUMMARY OF STORAGE:
     INFLOW  VOLUME =     86.965 AF
     BASIN  STORAGE =     12.250 AF (WITH     12.250 AF INITIALLY FILLED)
     OUTFLOW VOLUME =     86.965 AF
     LOSS    VOLUME =      0.000 AF


 ****************************************************************************
   FLOW PROCESS FROM NODE   1061.00 TO NODE   1061.00 IS CODE =  11
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   >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
 ============================================================================

             STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
         (Note: Time indicated is at END of Each Unit Intervals)
 ----------------------------------------------------------------------------
  TIME(HRS) VOLUME(AF)   Q(CFS) 0.       100.0     200.0     300.0     400.0
 ----------------------------------------------------------------------------
    0.083      0.0005      0.07  Q         .         .         .         .
    0.167      0.0035      0.44  Q         .         .         .         .
    0.250      0.0136      1.47  Q         .         .         .         .
    0.333      0.0369      3.38  Q         .         .         .         .
    0.417      0.0786      6.06  Q         .         .         .         .
    0.500      0.1428      9.32  Q         .         .         .         .
    0.583      0.2334     13.16  VQ        .         .         .         .
    0.667      0.3544     17.56  VQ        .         .         .         .
    0.750      0.5086     22.39  V Q       .         .         .         .
    0.833      0.6978     27.47  V Q       .         .         .         .
    0.917      0.9227     32.67  V  Q      .         .         .         .
    1.000      1.1833     37.83  V  Q      .         .         .         .
    1.083      1.4786     42.88  V   Q     .         .         .         .
    1.167      1.8098     48.08  V   Q     .         .         .         .
    1.250      2.1801     53.78  .V   Q    .         .         .         .
    1.333      2.5938     60.07  .V    Q   .         .         .         .
    1.417      3.0535     66.75  .V    Q   .         .         .         .
    1.500      3.5609     73.67  .V     Q  .         .         .         .
    1.583      4.1182     80.92  .V      Q .         .         .         .
    1.667      4.7287     88.64  . V     Q .         .         .         .
    1.750      5.3954     96.81  . V      Q.         .         .         .
    1.833      6.1211    105.38  . V       Q         .         .         .
    1.917      6.9097    114.50  .  V      .Q        .         .         .
    2.000      7.7650    124.18  .  V      . Q       .         .         .
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```
2.083      8.7191    138.54  .   V     .  Q      .         .         .
2.167      9.8289    161.14  .   V     .     Q   .         .         .
2.250     11.0854    182.44  .    V    .       Q .         .         .
2.333     12.4598    199.56  .    V    .        Q.         .         .
2.417     13.9684    219.05  .     V   .         .Q        .         .
2.500     15.6322    241.59  .      V  .         .   Q     .         .
2.583     17.4797    268.25  .       V .         .     Q   .         .
2.667     19.5349    298.41  .       V .         .        Q.         .
2.750     21.7762    325.44  .         V         .         . Q       .
2.833     24.1647    346.81  .         .V        .         .   Q     .
2.917     26.6654    363.11  .         . V       .         .     Q   .
3.000     29.2285    372.16  .         .  V      .         .      Q  .
3.083     31.8109    374.97  .         .   V     .         .      Q  .
3.167     34.3825    373.39  .         .    V    .         .      Q  .
3.250     36.9201    368.46  .         .     V   .         .     Q   .
3.333     39.4062    360.99  .         .       V .         .     Q   .
3.417     41.8297    351.90  .         .        V.         .    Q    .
3.500     44.1844    341.89  .         .         V         .   Q     .
3.583     46.4665    331.36  .         .         .V        .  Q      .
3.667     48.6742    320.56  .         .         . V       . Q       .
3.750     50.8004    308.72  .         .         .  V      Q         .
3.833     52.8212    293.42  .         .         .   V    Q.         .
3.917     54.7218    275.98  .         .         .    V Q  .         .
4.000     56.5070    259.20  .         .         .    Q    .         .
4.083     58.1813    243.11  .         .         .   Q V   .         .
4.167     59.7497    227.74  .         .         . Q    V  .         .
4.250     61.2173    213.09  .         .         .Q      V .         .
4.333     62.5887    199.13  .         .        Q.       V .         .
4.417     63.8684    185.82  .         .       Q .        V.         .
4.500     65.0429    170.54  .         .      Q  .        V.         .
4.583     66.0933    152.52  .         .    Q    .         V         .
4.667     67.0396    137.39  .         .  Q      .         V         .
4.750     67.9266    128.80  .         . Q       .         .V        .
4.833     68.7773    123.51  .         . Q       .         .V        .
4.917     69.5927    118.40  .         .Q        .         . V       .
5.000     70.3741    113.46  .         .Q        .         . V       .
5.083     71.1224    108.65  .         Q         .         . V       .
5.167     71.8384    103.96  .         Q         .         .  V      .
5.250     72.5228     99.37  .        Q.         .         .  V      .
5.333     73.1766     94.94  .        Q.         .         .  V      .
5.417     73.8011     90.67  .        Q.         .         .  V      .
5.500     74.3974     86.58  .       Q .         .         .   V     .
5.583     74.9667     82.67  .       Q .         .         .   V     .
5.667     75.5103     78.92  .      Q  .         .         .   V     .
5.750     76.0292     75.35  .      Q  .         .         .   V     .
5.833     76.5246     71.93  .      Q  .         .         .    V    .
5.917     76.9976     68.67  .     Q   .         .         .    V    .
6.000     77.4491     65.56  .     Q   .         .         .    V    .
6.083     77.8802     62.59  .     Q   .         .         .    V    .
6.167     78.2917     59.76  .    Q    .         .         .     V   .
6.250     78.6847     57.05  .    Q    .         .         .     V   .
6.333     79.0598     54.47  .    Q    .         .         .     V   .
6.417     79.4179     52.00  .    Q    .         .         .     V   .
6.500     79.7598     49.64  .   Q     .         .         .     V   .
6.583     80.0862     47.39  .   Q     .         .         .     V   .
6.667     80.3978     45.25  .   Q     .         .         .     V   .
6.750     80.6953     43.20  .   Q     .         .         .      V  .
6.833     80.9793     41.24  .   Q     .         .         .      V  .
6.917     81.2505     39.37  .  Q      .         .         .      V  .
7.000     81.5094     37.59  .  Q      .         .         .      V  .
7.083     81.7565     35.89  .  Q      .         .         .      V  .
7.167     81.9925     34.26  .  Q      .         .         .      V  .
7.250     82.2177     32.71  .  Q      .         .         .      V  .
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7.333	82.4328	31.23	. Q . . . V .
7.417	82.6381	29.81	. Q . . . V .
7.500	82.8341	28.46	. Q . . . V .
7.583	83.0212	27.17	. Q . . . V .
7.667	83.1999	25.94	. Q . . . V .
7.750	83.3705	24.77	. Q . . . V .
7.833	83.5333	23.64	. Q . . . V .
7.917	83.6888	22.57	. Q . . . V .
8.000	83.8372	21.55	. Q . . . V .
8.083	83.9789	20.57	. Q . . . V .
8.167	84.1141	19.64	.Q . . . V .
8.250	84.2433	18.75	.Q . . . V .
8.333	84.3666	17.90	.Q . . . V .
8.417	84.4843	17.09	.Q . . . V .
8.500	84.5967	16.32	.Q . . . V .
8.583	84.7039	15.58	.Q . . . V .
8.667	84.8064	14.87	.Q . . . V.
8.750	84.9042	14.20	.Q . . . V.
8.833	84.9975	13.56	.Q . . . V.
8.917	85.0866	12.94	.Q . . . V.
9.000	85.1717	12.35	.Q . . . V.
9.083	85.2530	11.80	.Q . . . V.
9.167	85.3305	11.26	.Q . . . V.
9.250	85.4046	10.75	.Q . . . V.
9.333	85.4752	10.26	.Q . . . V.
9.417	85.5427	9.80	Q . . . V.
9.500	85.6072	9.35	Q . . . V.
9.583	85.6687	8.93	Q . . . V.
9.667	85.7274	8.53	Q . . . V.
9.750	85.7834	8.14	Q . . . V.
9.833	85.8370	7.77	Q . . . V.
9.917	85.8881	7.42	Q . . . V.
10.000	85.9368	7.08	Q . . . V.
10.083	85.9834	6.76	Q . . . V.
10.167	86.0279	6.46	Q . . . V.
10.250	86.0703	6.16	Q . . . V.
10.333	86.1109	5.88	Q . . . V.
10.417	86.1495	5.62	Q . . . V.
10.500	86.1865	5.36	Q . . . V.
10.583	86.2217	5.12	Q . . . V.
10.667	86.2554	4.89	Q . . . V.
10.750	86.2876	4.67	Q . . . V.
10.833	86.3182	4.46	Q . . . V.
10.917	86.3475	4.25	Q . . . V.
11.000	86.3755	4.06	Q . . . V.
11.083	86.4022	3.88	Q . . . V.
11.167	86.4277	3.70	Q . . . V.
11.250	86.4520	3.53	Q . . . V.
11.333	86.4753	3.37	Q . . . V.
11.417	86.4974	3.22	Q . . . V.
11.500	86.5186	3.07	Q . . . V.
11.583	86.5388	2.94	Q . . . V.
11.667	86.5581	2.80	Q . . . V.
11.750	86.5766	2.68	Q . . . V.
11.833	86.5942	2.55	Q . . . V.
11.917	86.6110	2.44	Q . . . V.
12.000	86.6270	2.33	Q . . . V.
12.083	86.6423	2.22	Q . . . V.
12.167	86.6569	2.12	Q . . . V.
12.250	86.6709	2.03	Q . . . V.
12.333	86.6842	1.93	Q . . . V.
12.417	86.6969	1.85	Q . . . V.
12.500	86.7090	1.76	Q . . . V.

12.583	86.7206	1.68	Q	.	.	.	V.
12.667	86.7317	1.61	Q	.	.	.	V.
12.750	86.7423	1.53	Q	.	.	.	V.
12.833	86.7523	1.46	Q	.	.	.	V.
12.917	86.7620	1.40	Q	.	.	.	V.
13.000	86.7712	1.33	Q	.	.	.	V.
13.083	86.7799	1.27	Q	.	.	.	V.
13.167	86.7883	1.22	Q	.	.	.	V.
13.250	86.7963	1.16	Q	.	.	.	V.
13.333	86.8040	1.11	Q	.	.	.	V.
13.417	86.8112	1.06	Q	.	.	.	V.
13.500	86.8182	1.01	Q	.	.	.	V.
13.583	86.8249	0.96	Q	.	.	.	V.
13.667	86.8312	0.92	Q	.	.	.	V.
13.750	86.8373	0.88	Q	.	.	.	V.
13.833	86.8430	0.84	Q	.	.	.	V.
13.917	86.8486	0.80	Q	.	.	.	V.
14.000	86.8538	0.77	Q	.	.	.	V.
14.083	86.8589	0.73	Q	.	.	.	V.
14.167	86.8637	0.70	Q	.	.	.	V.
14.250	86.8683	0.67	Q	.	.	.	V.
14.333	86.8726	0.64	Q	.	.	.	V.
14.417	86.8768	0.61	Q	.	.	.	V.
14.500	86.8808	0.58	Q	.	.	.	V.
14.583	86.8846	0.55	Q	.	.	.	V.
14.667	86.8883	0.53	Q	.	.	.	V.
14.750	86.8917	0.50	Q	.	.	.	V.
14.833	86.8950	0.48	Q	.	.	.	V.
14.917	86.8982	0.46	Q	.	.	.	V.
15.000	86.9012	0.44	Q	.	.	.	V.
15.083	86.9041	0.42	Q	.	.	.	V.
15.167	86.9069	0.40	Q	.	.	.	V.
15.250	86.9095	0.38	Q	.	.	.	V.
15.333	86.9120	0.36	Q	.	.	.	V.
15.417	86.9144	0.35	Q	.	.	.	V.
15.500	86.9167	0.33	Q	.	.	.	V.
15.583	86.9189	0.32	Q	.	.	.	V.
15.667	86.9210	0.30	Q	.	.	.	V.
15.750	86.9230	0.29	Q	.	.	.	V.
15.833	86.9249	0.28	Q	.	.	.	V.
15.917	86.9267	0.26	Q	.	.	.	V.
16.000	86.9284	0.25	Q	.	.	.	V.
16.083	86.9301	0.24	Q	.	.	.	V.
16.167	86.9316	0.23	Q	.	.	.	V.
16.250	86.9331	0.22	Q	.	.	.	V.
16.333	86.9346	0.21	Q	.	.	.	V.
16.417	86.9360	0.20	Q	.	.	.	V.
16.500	86.9373	0.19	Q	.	.	.	V.
16.583	86.9385	0.18	Q	.	.	.	V.
16.667	86.9397	0.17	Q	.	.	.	V.
16.750	86.9409	0.17	Q	.	.	.	V.
16.833	86.9420	0.16	Q	.	.	.	V.
16.917	86.9430	0.15	Q	.	.	.	V.
17.000	86.9440	0.14	Q	.	.	.	V.
17.083	86.9449	0.14	Q	.	.	.	V.
17.167	86.9458	0.13	Q	.	.	.	V.
17.250	86.9467	0.13	Q	.	.	.	V.
17.333	86.9475	0.12	Q	.	.	.	V.
17.417	86.9483	0.11	Q	.	.	.	V.
17.500	86.9491	0.11	Q	.	.	.	V.
17.583	86.9498	0.10	Q	.	.	.	V.
17.667	86.9505	0.10	Q	.	.	.	V.
17.750	86.9511	0.10	Q	.	.	.	V.

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  17.833     86.9518      0.09  Q         .         .         .        V.
  17.917     86.9523      0.09  Q         .         .         .        V.
  18.000     86.9529      0.08  Q         .         .         .        V.
  18.083     86.9535      0.08  Q         .         .         .        V.
  18.167     86.9540      0.08  Q         .         .         .        V.
  18.250     86.9545      0.07  Q         .         .         .        V.
  18.333     86.9549      0.07  Q         .         .         .        V.
  18.417     86.9554      0.07  Q         .         .         .        V.
  18.500     86.9558      0.06  Q         .         .         .        V.
  18.583     86.9562      0.06  Q         .         .         .        V.
  18.667     86.9566      0.06  Q         .         .         .        V.
  18.750     86.9570      0.05  Q         .         .         .        V.
  18.833     86.9574      0.05  Q         .         .         .        V.
  18.917     86.9577      0.05  Q         .         .         .        V.
  19.000     86.9580      0.05  Q         .         .         .        V.
  19.083     86.9584      0.05  Q         .         .         .        V.
  19.167     86.9587      0.04  Q         .         .         .        V.
  19.250     86.9589      0.04  Q         .         .         .        V.
  19.333     86.9592      0.04  Q         .         .         .        V.
  19.417     86.9595      0.04  Q         .         .         .        V.
  19.500     86.9597      0.04  Q         .         .         .        V.
  19.583     86.9600      0.03  Q         .         .         .        V.
  19.667     86.9602      0.03  Q         .         .         .        V.
  19.750     86.9604      0.03  Q         .         .         .        V.
  19.833     86.9606      0.03  Q         .         .         .        V.
  19.917     86.9608      0.03  Q         .         .         .        V.
  20.000     86.9610      0.03  Q         .         .         .        V.
------------------------------------------------------------------------------
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   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   =======================                =========
             0%                            1205.0
            10%                             365.0
            20%                             255.0
            30%                             190.0
            40%                             150.0
            50%                             125.0
            60%                             105.0
            70%                              85.0
            80%                              65.0
            90%                              45.0


 *****************************************************************************
   FLOW PROCESS FROM NODE   1061.00 TO NODE    106.00 IS CODE = 5.2
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   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    4.00     CHANNEL Z =  1.50
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UPSTREAM ELEVATION(FT) = 2464.00
DOWNSTREAM ELEVATION(FT) = 2447.00
CHANNEL LENGTH(FT) = 685.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 374.97
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 299.13
CHANNEL NORMAL VELOCITY FOR Q = 299.13 CFS = 18.95 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.918

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	0.07	0.06	0.06
0.167	0.44	0.40	0.40
0.250	1.47	1.36	1.36
0.333	3.38	3.17	3.17
0.417	6.06	5.76	5.76
0.500	9.32	8.96	8.96
0.583	13.16	12.74	12.74
0.667	17.56	17.08	17.08
0.750	22.39	21.85	21.85
0.833	27.47	26.91	26.91
0.917	32.67	32.09	32.09
1.000	37.83	37.26	37.26
1.083	42.88	42.33	42.33
1.167	48.08	47.51	47.51
1.250	53.78	53.15	53.15
1.333	60.07	59.37	59.37
1.417	66.75	66.01	66.01
1.500	73.67	72.91	72.91
1.583	80.92	80.12	80.12
1.667	88.64	87.79	87.79
1.750	96.81	95.91	95.91
1.833	105.38	104.43	104.43
1.917	114.50	113.49	113.49
2.000	124.18	123.11	123.11
2.083	138.54	136.95	136.95
2.167	161.14	158.64	158.64
2.250	182.44	180.09	180.09
2.333	199.56	197.67	197.67
2.417	219.05	216.90	216.90
2.500	241.59	239.10	239.10
2.583	268.25	265.30	265.30
2.667	298.41	295.07	295.07
2.750	325.44	322.45	322.45
2.833	346.81	344.44	344.44
2.917	363.11	361.30	361.30
3.000	372.16	371.16	371.16
3.083	374.97	374.66	374.66
3.167	373.39	373.56	373.56
3.250	368.46	369.00	369.00
3.333	360.99	361.81	361.81
3.417	351.90	352.90	352.90
3.500	341.89	343.00	343.00

3.583	331.36	332.53	332.53
3.667	320.56	321.76	321.76
3.750	308.72	310.03	310.03
3.833	293.42	295.11	295.11
3.917	275.98	277.91	277.91
4.000	259.20	261.06	261.06
4.083	243.11	244.89	244.89
4.167	227.74	229.44	229.44
4.250	213.09	214.71	214.71
4.333	199.13	200.67	200.67
4.417	185.82	187.29	187.29
4.500	170.54	172.23	172.23
4.583	152.52	154.52	154.52
4.667	137.39	139.07	139.07
4.750	128.80	129.75	129.75
4.833	123.51	124.10	124.10
4.917	118.40	118.97	118.97
5.000	113.46	114.01	114.01
5.083	108.65	109.19	109.19
5.167	103.96	104.48	104.48
5.250	99.37	99.88	99.88
5.333	94.94	95.43	95.43
5.417	90.67	91.14	91.14
5.500	86.58	87.04	87.04
5.583	82.67	83.10	83.10
5.667	78.92	79.34	79.34
5.750	75.35	75.74	75.74
5.833	71.93	72.31	72.31
5.917	68.67	69.04	69.04
6.000	65.56	65.91	65.91
6.083	62.59	62.92	62.92
6.167	59.76	60.07	60.07
6.250	57.05	57.35	57.35
6.333	54.47	54.75	54.75
6.417	52.00	52.27	52.27
6.500	49.64	49.90	49.90
6.583	47.39	47.64	47.64
6.667	45.25	45.48	45.48
6.750	43.20	43.42	43.42
6.833	41.24	41.46	41.46
6.917	39.37	39.58	39.58
7.000	37.59	37.79	37.79
7.083	35.89	36.07	36.07
7.167	34.26	34.44	34.44
7.250	32.71	32.88	32.88
7.333	31.23	31.39	31.39
7.417	29.81	29.97	29.97
7.500	28.46	28.61	28.61
7.583	27.17	27.31	27.31
7.667	25.94	26.08	26.08
7.750	24.77	24.90	24.90
7.833	23.64	23.77	23.77
7.917	22.57	22.69	22.69
8.000	21.55	21.66	21.66
8.083	20.57	20.68	20.68
8.167	19.64	19.74	19.74
8.250	18.75	18.85	18.85
8.333	17.90	18.00	18.00
8.417	17.09	17.18	17.18
8.500	16.32	16.40	16.40
8.583	15.58	15.66	15.66
8.667	14.87	14.95	14.95
8.750	14.20	14.27	14.27

8.833	13.56	13.63	13.63
8.917	12.94	13.01	13.01
9.000	12.35	12.42	12.42
9.083	11.80	11.86	11.86
9.167	11.26	11.32	11.32
9.250	10.75	10.81	10.81
9.333	10.26	10.32	10.32
9.417	9.80	9.85	9.85
9.500	9.35	9.40	9.40
9.583	8.93	8.98	8.98
9.667	8.53	8.57	8.57
9.750	8.14	8.18	8.18
9.833	7.77	7.81	7.81
9.917	7.42	7.46	7.46
10.000	7.08	7.12	7.12
10.083	6.76	6.80	6.80
10.167	6.46	6.49	6.49
10.250	6.16	6.20	6.20
10.333	5.88	5.92	5.92
10.417	5.62	5.65	5.65
10.500	5.36	5.39	5.39
10.583	5.12	5.15	5.15
10.667	4.89	4.91	4.91
10.750	4.67	4.69	4.69
10.833	4.46	4.48	4.48
10.917	4.25	4.28	4.28
11.000	4.06	4.08	4.08
11.083	3.88	3.90	3.90
11.167	3.70	3.72	3.72
11.250	3.53	3.55	3.55
11.333	3.37	3.39	3.39
11.417	3.22	3.24	3.24
11.500	3.07	3.09	3.09
11.583	2.94	2.95	2.95
11.667	2.80	2.82	2.82
11.750	2.68	2.69	2.69
11.833	2.55	2.57	2.57
11.917	2.44	2.45	2.45
12.000	2.33	2.34	2.34
12.083	2.22	2.23	2.23
12.167	2.12	2.13	2.13
12.250	2.03	2.04	2.04
12.333	1.93	1.94	1.94
12.417	1.85	1.86	1.86
12.500	1.76	1.77	1.77
12.583	1.68	1.69	1.69
12.667	1.61	1.62	1.62
12.750	1.53	1.54	1.54
12.833	1.46	1.47	1.47
12.917	1.40	1.41	1.41
13.000	1.33	1.34	1.34
13.083	1.27	1.28	1.28
13.167	1.22	1.22	1.22
13.250	1.16	1.17	1.17
13.333	1.11	1.11	1.11
13.417	1.06	1.06	1.06
13.500	1.01	1.02	1.02
13.583	0.96	0.97	0.97
13.667	0.92	0.93	0.93
13.750	0.88	0.88	0.88
13.833	0.84	0.84	0.84
13.917	0.80	0.81	0.81
14.000	0.77	0.77	0.77

14.083	0.73	0.73	0.73
14.167	0.70	0.70	0.70
14.250	0.67	0.67	0.67
14.333	0.64	0.64	0.64
14.417	0.61	0.61	0.61
14.500	0.58	0.58	0.58
14.583	0.55	0.56	0.56
14.667	0.53	0.53	0.53
14.750	0.50	0.51	0.51
14.833	0.48	0.48	0.48
14.917	0.46	0.46	0.46
15.000	0.44	0.44	0.44
15.083	0.42	0.42	0.42
15.167	0.40	0.40	0.40
15.250	0.38	0.38	0.38
15.333	0.36	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.33	0.33	0.33
15.583	0.32	0.32	0.32
15.667	0.30	0.30	0.30
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.26	0.26	0.26
16.000	0.25	0.25	0.25
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.18	0.18	0.18
16.667	0.17	0.17	0.17
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.14	0.14	0.14
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.11	0.11	0.11
17.500	0.11	0.11	0.11
17.583	0.10	0.10	0.10
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.05	0.05	0.05
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04

```
         19.333        0.04        0.04        0.04
         19.417        0.04        0.04        0.04
         19.500        0.04        0.04        0.04
         19.583        0.03        0.03        0.03
         19.667        0.03        0.03        0.03
         19.750        0.03        0.03        0.03
         19.833        0.03        0.03        0.03
         19.917        0.03        0.03        0.03
         20.000        0.03        0.03        0.03
         20.083        0.03        0.03        0.03
         20.167        0.02        0.02        0.02
         20.250        0.02        0.02        0.02
         20.333        0.02        0.02        0.02
         20.417        0.02        0.02        0.02
         20.500        0.02        0.02        0.02
         20.583        0.02        0.02        0.02
         20.667        0.02        0.02        0.02
         20.750        0.02        0.02        0.02
         20.833        0.02        0.02        0.02
         20.917        0.02        0.02        0.02
         21.000        0.02        0.02        0.02
         21.083        0.01        0.01        0.01
         21.167        0.01        0.01        0.01
         21.250        0.01        0.01        0.01
         21.333        0.01        0.01        0.01
         21.417        0.01        0.01        0.01
         21.500        0.01        0.01        0.01
         21.583        0.01        0.01        0.01
         21.667        0.01        0.01        0.01
         21.750        0.01        0.01        0.01
         21.833        0.01        0.01        0.01
         21.917        0.01        0.01        0.01
         22.000        0.01        0.01        0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     86.965 AF
    OUTFLOW VOLUME =     86.965 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      20.600 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.085
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
```

UNIT INTERVAL PERCENTAGE OF LAG-TIME = 83.333

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	34.863
2	59.664	113.779
3	78.792	47.654
4	86.766	19.865
5	91.428	11.615
6	94.514	7.689
7	96.650	5.320
8	98.044	3.474
9	98.699	1.630
10	99.289	1.471
11	99.716	1.063
12	99.929	0.531
13	100.000	0.177

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0071	0.0222
2	0.0292	0.0071	0.0222
3	0.0247	0.0071	0.0177
4	0.0337	0.0071	0.0267
5	0.0337	0.0071	0.0267
6	0.0405	0.0071	0.0334
7	0.0337	0.0071	0.0267
8	0.0405	0.0071	0.0334
9	0.0405	0.0071	0.0334
10	0.0337	0.0071	0.0267
11	0.0360	0.0071	0.0289
12	0.0405	0.0071	0.0334
13	0.0495	0.0071	0.0424
14	0.0495	0.0071	0.0424
15	0.0495	0.0071	0.0424
16	0.0450	0.0071	0.0379
17	0.0585	0.0071	0.0514
18	0.0607	0.0071	0.0537
19	0.0540	0.0071	0.0469
20	0.0607	0.0071	0.0537
21	0.0742	0.0071	0.0672
22	0.0697	0.0071	0.0627
23	0.0652	0.0071	0.0582
24	0.0675	0.0071	0.0604
25	0.0697	0.0071	0.0627
26	0.0945	0.0071	0.0874
27	0.1125	0.0071	0.1054
28	0.0787	0.0071	0.0717
29	0.1530	0.0071	0.1459
30	0.1642	0.0071	0.1572
31	0.1845	0.0071	0.1774
32	0.1327	0.0071	0.1257
33	0.0450	0.0071	0.0379
34	0.0405	0.0071	0.0334
35	0.0405	0.0071	0.0334
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.25
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.00

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.4362
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 3.4242

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============================================================================

                          3 - H O U R    S T O R M
                        R U N O F F    H Y D R O G R A P H

============================================================================
                 HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
          (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       10.0      20.0      30.0      40.0
----------------------------------------------------------------------------
   0.083      0.0053      0.77  Q         .         .         .         .
   0.167      0.0280      3.30  V  Q      .         .         .         .
   0.250      0.0569      4.20  V   Q     .         .         .         .
   0.333      0.0875      4.44  .V  Q     .         .         .         .
   0.417      0.1254      5.51  .V   Q    .         .         .         .
   0.500      0.1685      6.25  .V    Q   .         .         .         .
   0.583      0.2169      7.03  . V    Q  .         .         .         .
   0.667      0.2649      6.97  .  V  Q   .         .         .         .
   0.750      0.3174      7.63  .  V   Q  .         .         .         .
   0.833      0.3706      7.72  .   V  Q  .         .         .         .
   0.917      0.4201      7.19  .   V  Q  .         .         .         .
   1.000      0.4708      7.36  .    V Q  .         .         .         .
   1.083      0.5274      8.21  .     V Q .         .         .         .
   1.167      0.5924      9.45  .     V  Q.         .         .         .
   1.250      0.6611      9.97  .      V Q.         .         .         .
   1.333      0.7301     10.03  .       V Q         .         .         .
   1.417      0.7999     10.12  .        VQ         .         .         .
   1.500      0.8799     11.62  .         VQ        .         .         .
   1.583      0.9643     12.25  .         .VQ       .         .         .
   1.667      1.0475     12.08  .         . Q       .         .         .
   1.750      1.1383     13.18  .         .  Q      .         .         .
   1.833      1.2407     14.87  .         .   Q     .         .         .
   1.917      1.3439     14.99  .         .   QV    .         .         .
   2.000      1.4451     14.69  .         .   Q V   .         .         .
   2.083      1.5479     14.92  .         .   Q   V .         .         .
   2.167      1.6591     16.14  .         .     Q  V.         .         .
   2.250      1.7951     19.75  .         .        QV         .         .
   2.333      1.9457     21.87  .         .         .QV       .         .
   2.417      2.0972     22.00  .         .         .Q  V     .         .
   2.500      2.3032     29.91  .         .         .     V  Q.         .
   2.583      2.5455     35.18  .         .         .        V.    Q    .
   2.667      2.8043     37.58  .         .         .         . V    Q  .
   2.750      3.0151     30.61  .         .         .         Q    V    .
   2.833      3.1461     19.03  .         .        Q.         .     V   .
   2.917      3.2424     13.98  .         .  Q      .         .      V  .
   3.000      3.3179     10.96  .         Q         .         .       V .
   3.083      3.3622      6.43  .     Q   .         .         .        V.
   3.167      3.3868      3.57  .  Q      .         .         .        V.
   3.250      3.4016      2.15  . Q       .         .         .        V.
   3.333      3.4110      1.37  .Q        .         .         .        V.
   3.417      3.4171      0.89  Q         .         .         .        V.
   3.500      3.4207      0.52  Q         .         .         .        V.
   3.583      3.4225      0.27  Q         .         .         .        V.
   3.667      3.4235      0.14  Q         .         .         .        V.
   3.750      3.4240      0.07  Q         .         .         .        V.
   3.833      3.4242      0.03  Q         .         .         .        V.
   3.917      3.4242      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

```
   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
             0%                              235.0
            10%                              175.0
            20%                              130.0
            30%                               90.0
            40%                               45.0
            50%                               40.0
            60%                               20.0
            70%                               20.0
            80%                               15.0
            90%                               10.0


****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      100.0     200.0     300.0     400.0
----------------------------------------------------------------------------
   0.083      0.0057      0.83  Q         .         .         .         .
   0.167      0.0312      3.70  Q         .         .         .         .
   0.250      0.0695      5.55  Q         .         .         .         .
   0.333      0.1218      7.61  Q         .         .         .         .
   0.417      0.1994     11.27  VQ        .         .         .         .
   0.500      0.3042     15.21  VQ        .         .         .         .
   0.583      0.4403     19.77  VQ        .         .         .         .
   0.667      0.6059     24.04  V Q       .         .         .         .
   0.750      0.8089     29.48  V Q       .         .         .         .
   0.833      1.0474     34.63  V  Q      .         .         .         .
   0.917      1.3179     39.28  V  Q      .         .         .         .
   1.000      1.6252     44.62  V   Q     .         .         .         .
   1.083      1.9733     50.54  V    Q    .         .         .         .
   1.167      2.3655     56.95  .V   Q    .         .         .         .
   1.250      2.8002     63.11  .V    Q   .         .         .         .
   1.333      3.2782     69.40  .V    Q   .         .         .         .
   1.417      3.8025     76.14  .V     Q  .         .         .         .
   1.500      4.3847     84.53  .V      Q .         .         .         .
   1.583      5.0208     92.37  . V      Q.         .         .         .
   1.667      5.7086     99.87  . V      Q.         .         .         .
   1.750      6.4599    109.09  . V       Q         .         .         .
   1.833      7.2816    119.30  .  V      .Q        .         .         .
   1.917      8.1664    128.48  .  V      . Q       .         .         .
   2.000      9.1155    137.81  .   V     .  Q      .         .         .
   2.083     10.1614    151.87  .   V     .    Q    .         .         .
   2.167     11.3652    174.78  .    V    .      Q  .         .         .
   2.250     12.7415    199.84  .    V    .        Q.         .         .
   2.333     14.2534    219.54  .     V   .         .Q        .         .
   2.417     15.8987    238.90  .      V  .         .  Q      .         .
   2.500     17.7514    269.00  .      V  .         .     Q   .         .
   2.583     19.8208    300.49  .       V .         .         Q         .
   2.667     22.1118    332.65  .        V.         .         .  Q      .
   2.750     24.5434    353.06  .         V         .         .    Q    .
   2.833     27.0466    363.47  .         .V        .         .     Q   .
   2.917     29.6312    375.28  .         .  V      .         .      Q  .
   3.000     32.2629    382.12  .         .   V     .         .       Q .
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3.083     34.8875    381.09  .         .    V    .         .       Q .
3.167     37.4848    377.13  .         .     V   .         .      Q  .
3.250     40.0410    371.15  .         .      V  .         .      Q  .
3.333     42.5422    363.18  .         .       V .         .     Q   .
3.417     44.9788    353.79  .         .        V.         .    Q    .
3.500     47.3446    343.51  .         .         V         .   Q     .
3.583     49.6366    332.79  .         .         .V        .  Q      .
3.667     51.8535    321.90  .         .         . V       . Q       .
3.750     53.9892    310.10  .         .         .  V      .Q        .
3.833     56.0218    295.14  .         .         .   V    Q.         .
3.917     57.9359    277.91  .         .         .    V Q  .         .
4.000     59.7338    261.06  .         .         .     Q   .         .
4.083     61.4204    244.89  .         .         .   Q  V  .         .
4.167     63.0005    229.44  .         .         . Q    V  .         .
4.250     64.4792    214.71  .         .         .Q      V .         .
4.333     65.8612    200.67  .         .         Q        V.         .
4.417     67.1511    187.29  .         .       Q .        V.         .
4.500     68.3372    172.23  .         .      Q  .         V         .
4.583     69.4014    154.52  .         .    Q    .         V         .
4.667     70.3592    139.07  .         .  Q      .         .V        .
4.750     71.2528    129.75  .         . Q       .         .V        .
4.833     72.1074    124.10  .         . Q       .         .V        .
4.917     72.9268    118.97  .         .Q        .         . V       .
5.000     73.7119    114.01  .         .Q        .         . V       .
5.083     74.4639    109.19  .         Q         .         . V       .
5.167     75.1835    104.48  .         Q         .         .  V      .
5.250     75.8713     99.88  .        Q.         .         .  V      .
5.333     76.5286     95.43  .        Q.         .         .  V      .
5.417     77.1563     91.14  .        Q.         .         .   V     .
5.500     77.7557     87.04  .       Q .         .         .   V     .
5.583     78.3280     83.10  .       Q .         .         .   V     .
5.667     78.8744     79.34  .      Q  .         .         .   V     .
5.750     79.3960     75.74  .      Q  .         .         .    V    .
5.833     79.8941     72.31  .      Q  .         .         .    V    .
5.917     80.3695     69.04  .     Q   .         .         .    V    .
6.000     80.8234     65.91  .     Q   .         .         .    V    .
6.083     81.2568     62.92  .     Q   .         .         .    V    .
6.167     81.6705     60.07  .     Q   .         .         .     V   .
6.250     82.0654     57.35  .    Q    .         .         .     V   .
6.333     82.4425     54.75  .    Q    .         .         .     V   .
6.417     82.8025     52.27  .    Q    .         .         .     V   .
6.500     83.1462     49.90  .   Q     .         .         .     V   .
6.583     83.4743     47.64  .   Q     .         .         .     V   .
6.667     83.7876     45.48  .   Q     .         .         .      V  .
6.750     84.0867     43.42  .   Q     .         .         .      V  .
6.833     84.3722     41.46  .   Q     .         .         .      V  .
6.917     84.6448     39.58  .  Q      .         .         .      V  .
7.000     84.9050     37.79  .  Q      .         .         .      V  .
7.083     85.1534     36.07  .  Q      .         .         .      V  .
7.167     85.3906     34.44  .  Q      .         .         .      V  .
7.250     85.6171     32.88  .  Q      .         .         .      V  .
7.333     85.8332     31.39  .  Q      .         .         .      V  .
7.417     86.0396     29.97  . Q       .         .         .       V .
7.500     86.2367     28.61  . Q       .         .         .       V .
7.583     86.4248     27.31  . Q       .         .         .       V .
7.667     86.6044     26.08  . Q       .         .         .       V .
7.750     86.7758     24.90  . Q       .         .         .       V .
7.833     86.9395     23.77  . Q       .         .         .       V .
7.917     87.0958     22.69  . Q       .         .         .       V .
8.000     87.2450     21.66  . Q       .         .         .       V .
8.083     87.3874     20.68  . Q       .         .         .       V .
8.167     87.5234     19.74  .Q        .         .         .       V .
8.250     87.6532     18.85  .Q        .         .         .       V .
```

8.333	87.7772	18.00	.Q	.	.	.	V .
8.417	87.8955	17.18	.Q	.	.	.	V .
8.500	88.0085	16.40	.Q	.	.	.	V .
8.583	88.1163	15.66	.Q	.	.	.	V .
8.667	88.2193	14.95	.Q	.	.	.	V.
8.750	88.3176	14.27	.Q	.	.	.	V.
8.833	88.4114	13.63	.Q	.	.	.	V.
8.917	88.5010	13.01	.Q	.	.	.	V.
9.000	88.5866	12.42	.Q	.	.	.	V.
9.083	88.6682	11.86	.Q	.	.	.	V.
9.167	88.7462	11.32	.Q	.	.	.	V.
9.250	88.8206	10.81	.Q	.	.	.	V.
9.333	88.8917	10.32	.Q	.	.	.	V.
9.417	88.9595	9.85	Q	.	.	.	V.
9.500	89.0243	9.40	Q	.	.	.	V.
9.583	89.0861	8.98	Q	.	.	.	V.
9.667	89.1451	8.57	Q	.	.	.	V.
9.750	89.2015	8.18	Q	.	.	.	V.
9.833	89.2553	7.81	Q	.	.	.	V.
9.917	89.3067	7.46	Q	.	.	.	V.
10.000	89.3557	7.12	Q	.	.	.	V.
10.083	89.4025	6.80	Q	.	.	.	V.
10.167	89.4472	6.49	Q	.	.	.	V.
10.250	89.4899	6.20	Q	.	.	.	V.
10.333	89.5306	5.92	Q	.	.	.	V.
10.417	89.5695	5.65	Q	.	.	.	V.
10.500	89.6067	5.39	Q	.	.	.	V.
10.583	89.6421	5.15	Q	.	.	.	V.
10.667	89.6759	4.91	Q	.	.	.	V.
10.750	89.7083	4.69	Q	.	.	.	V.
10.833	89.7391	4.48	Q	.	.	.	V.
10.917	89.7686	4.28	Q	.	.	.	V.
11.000	89.7967	4.08	Q	.	.	.	V.
11.083	89.8235	3.90	Q	.	.	.	V.
11.167	89.8491	3.72	Q	.	.	.	V.
11.250	89.8736	3.55	Q	.	.	.	V.
11.333	89.8970	3.39	Q	.	.	.	V.
11.417	89.9193	3.24	Q	.	.	.	V.
11.500	89.9405	3.09	Q	.	.	.	V.
11.583	89.9609	2.95	Q	.	.	.	V.
11.667	89.9803	2.82	Q	.	.	.	V.
11.750	89.9988	2.69	Q	.	.	.	V.
11.833	90.0165	2.57	Q	.	.	.	V.
11.917	90.0334	2.45	Q	.	.	.	V.
12.000	90.0495	2.34	Q	.	.	.	V.
12.083	90.0649	2.23	Q	.	.	.	V.
12.167	90.0796	2.13	Q	.	.	.	V.
12.250	90.0936	2.04	Q	.	.	.	V.
12.333	90.1070	1.94	Q	.	.	.	V.
12.417	90.1198	1.86	Q	.	.	.	V.
12.500	90.1320	1.77	Q	.	.	.	V.
12.583	90.1436	1.69	Q	.	.	.	V.
12.667	90.1547	1.62	Q	.	.	.	V.
12.750	90.1654	1.54	Q	.	.	.	V.
12.833	90.1755	1.47	Q	.	.	.	V.
12.917	90.1852	1.41	Q	.	.	.	V.
13.000	90.1944	1.34	Q	.	.	.	V.
13.083	90.2032	1.28	Q	.	.	.	V.
13.167	90.2117	1.22	Q	.	.	.	V.
13.250	90.2197	1.17	Q	.	.	.	V.
13.333	90.2274	1.11	Q	.	.	.	V.
13.417	90.2347	1.06	Q	.	.	.	V.
13.500	90.2417	1.02	Q	.	.	.	V.

13.583	90.2484	0.97	Q	.	.	.	V.
13.667	90.2548	0.93	Q	.	.	.	V.
13.750	90.2609	0.88	Q	.	.	.	V.
13.833	90.2667	0.84	Q	.	.	.	V.
13.917	90.2722	0.81	Q	.	.	.	V.
14.000	90.2775	0.77	Q	.	.	.	V.
14.083	90.2826	0.73	Q	.	.	.	V.
14.167	90.2874	0.70	Q	.	.	.	V.
14.250	90.2920	0.67	Q	.	.	.	V.
14.333	90.2964	0.64	Q	.	.	.	V.
14.417	90.3006	0.61	Q	.	.	.	V.
14.500	90.3046	0.58	Q	.	.	.	V.
14.583	90.3085	0.56	Q	.	.	.	V.
14.667	90.3121	0.53	Q	.	.	.	V.
14.750	90.3156	0.51	Q	.	.	.	V.
14.833	90.3189	0.48	Q	.	.	.	V.
14.917	90.3221	0.46	Q	.	.	.	V.
15.000	90.3252	0.44	Q	.	.	.	V.
15.083	90.3281	0.42	Q	.	.	.	V.
15.167	90.3308	0.40	Q	.	.	.	V.
15.250	90.3335	0.38	Q	.	.	.	V.
15.333	90.3360	0.37	Q	.	.	.	V.
15.417	90.3384	0.35	Q	.	.	.	V.
15.500	90.3407	0.33	Q	.	.	.	V.
15.583	90.3429	0.32	Q	.	.	.	V.
15.667	90.3450	0.30	Q	.	.	.	V.
15.750	90.3470	0.29	Q	.	.	.	V.
15.833	90.3489	0.28	Q	.	.	.	V.
15.917	90.3507	0.26	Q	.	.	.	V.
16.000	90.3525	0.25	Q	.	.	.	V.
16.083	90.3541	0.24	Q	.	.	.	V.
16.167	90.3557	0.23	Q	.	.	.	V.
16.250	90.3572	0.22	Q	.	.	.	V.
16.333	90.3587	0.21	Q	.	.	.	V.
16.417	90.3601	0.20	Q	.	.	.	V.
16.500	90.3614	0.19	Q	.	.	.	V.
16.583	90.3626	0.18	Q	.	.	.	V.
16.667	90.3639	0.17	Q	.	.	.	V.
16.750	90.3650	0.17	Q	.	.	.	V.
16.833	90.3661	0.16	Q	.	.	.	V.
16.917	90.3671	0.15	Q	.	.	.	V.
17.000	90.3681	0.14	Q	.	.	.	V.
17.083	90.3691	0.14	Q	.	.	.	V.
17.167	90.3700	0.13	Q	.	.	.	V.
17.250	90.3709	0.13	Q	.	.	.	V.
17.333	90.3717	0.12	Q	.	.	.	V.
17.417	90.3725	0.11	Q	.	.	.	V.
17.500	90.3733	0.11	Q	.	.	.	V.
17.583	90.3740	0.10	Q	.	.	.	V.
17.667	90.3747	0.10	Q	.	.	.	V.
17.750	90.3753	0.10	Q	.	.	.	V.
17.833	90.3759	0.09	Q	.	.	.	V.
17.917	90.3765	0.09	Q	.	.	.	V.
18.000	90.3771	0.08	Q	.	.	.	V.
18.083	90.3777	0.08	Q	.	.	.	V.
18.167	90.3782	0.08	Q	.	.	.	V.
18.250	90.3787	0.07	Q	.	.	.	V.
18.333	90.3792	0.07	Q	.	.	.	V.
18.417	90.3796	0.07	Q	.	.	.	V.
18.500	90.3801	0.06	Q	.	.	.	V.
18.583	90.3805	0.06	Q	.	.	.	V.
18.667	90.3809	0.06	Q	.	.	.	V.
18.750	90.3812	0.05	Q	.	.	.	V.

```
  18.833     90.3816      0.05  Q         .         .         .        V.
  18.917     90.3819      0.05  Q         .         .         .        V.
  19.000     90.3823      0.05  Q         .         .         .        V.
  19.083     90.3826      0.05  Q         .         .         .        V.
  19.167     90.3829      0.04  Q         .         .         .        V.
  19.250     90.3832      0.04  Q         .         .         .        V.
  19.333     90.3834      0.04  Q         .         .         .        V.
  19.417     90.3837      0.04  Q         .         .         .        V.
  19.500     90.3839      0.04  Q         .         .         .        V.
  19.583     90.3842      0.03  Q         .         .         .        V.
  19.667     90.3844      0.03  Q         .         .         .        V.
  19.750     90.3846      0.03  Q         .         .         .        V.
  19.833     90.3848      0.03  Q         .         .         .        V.
  19.917     90.3850      0.03  Q         .         .         .        V.
  20.000     90.3852      0.03  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
             0%                             1205.0
            10%                              365.0
            20%                              255.0
            30%                              190.0
            40%                              150.0
            50%                              130.0
            60%                              110.0
            70%                               90.0
            80%                               70.0
            90%                               45.0


 ****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
 ----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
 ============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      17.800 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.165
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	30.124
2	59.664	98.314
3	78.792	41.177
4	86.766	17.165
5	91.428	10.036
6	94.514	6.644
7	96.650	4.597
8	98.044	3.002
9	98.699	1.408
10	99.289	1.271
11	99.716	0.918
12	99.929	0.459
13	100.000	0.153

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0138	0.0155
2	0.0292	0.0138	0.0155
3	0.0247	0.0124	0.0124
4	0.0337	0.0138	0.0200
5	0.0337	0.0138	0.0200
6	0.0405	0.0138	0.0267
7	0.0337	0.0138	0.0200
8	0.0405	0.0138	0.0267
9	0.0405	0.0138	0.0267
10	0.0337	0.0138	0.0200
11	0.0360	0.0138	0.0222
12	0.0405	0.0138	0.0267
13	0.0495	0.0138	0.0357
14	0.0495	0.0138	0.0357
15	0.0495	0.0138	0.0357
16	0.0450	0.0138	0.0312
17	0.0585	0.0138	0.0447
18	0.0607	0.0138	0.0470
19	0.0540	0.0138	0.0402
20	0.0607	0.0138	0.0470
21	0.0742	0.0138	0.0605
22	0.0697	0.0138	0.0560
23	0.0652	0.0138	0.0515
24	0.0675	0.0138	0.0537
25	0.0697	0.0138	0.0560
26	0.0945	0.0138	0.0807
27	0.1125	0.0138	0.0987
28	0.0787	0.0138	0.0650
29	0.1530	0.0138	0.1392
30	0.1642	0.0138	0.1505
31	0.1845	0.0138	0.1707
32	0.1327	0.0138	0.1190
33	0.0450	0.0138	0.0312
34	0.0405	0.0138	0.0267
35	0.0405	0.0138	0.0267
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.49
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.76

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.7218
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.6141

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============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       10.0      20.0      30.0      40.0
----------------------------------------------------------------------------
   0.083      0.0032      0.47  Q         .         .         .         .
   0.167      0.0169      1.99  VQ        .         .         .         .
   0.250      0.0344      2.53  V Q       .         .         .         .
   0.333      0.0531      2.72  V Q       .         .         .         .
   0.417      0.0772      3.50  .V Q      .         .         .         .
   0.500      0.1052      4.07  .V  Q     .         .         .         .
   0.583      0.1376      4.70  . V Q     .         .         .         .
   0.667      0.1694      4.62  . V Q     .         .         .         .
   0.750      0.2050      5.18  .  V Q    .         .         .         .
   0.833      0.2412      5.25  .  V Q    .         .         .         .
   0.917      0.2741      4.78  .   Q     .         .         .         .
   1.000      0.3080      4.93  .   Q     .         .         .         .
   1.083      0.3470      5.66  .    Q    .         .         .         .
   1.167      0.3933      6.73  .     Q   .         .         .         .
   1.250      0.4427      7.17  .     VQ  .         .         .         .
   1.333      0.4925      7.23  .      Q  .         .         .         .
   1.417      0.5428      7.31  .      QV .         .         .         .
   1.500      0.6021      8.60  .       QV.         .         .         .
   1.583      0.6651      9.15  .        QV         .         .         .
   1.667      0.7271      9.00  .       Q .V        .         .         .
   1.750      0.7956      9.95  .        Q. V       .         .         .
   1.833      0.8742     11.41  .         .Q V      .         .         .
   1.917      0.9535     11.51  .         .Q  V     .         .         .
   2.000      1.0310     11.26  .         .Q   V    .         .         .
   2.083      1.1099     11.46  .         .Q    V   .         .         .
   2.167      1.1961     12.51  .         . Q     V .         .         .
   2.250      1.3037     15.63  .         .    Q   V.         .         .
   2.333      1.4239     17.46  .         .      Q  .V        .         .
   2.417      1.5449     17.57  .         .      Q  .  V      .         .
   2.500      1.7130     24.40  .         .         .   Q V   .         .
   2.583      1.9125     28.96  .         .         .       QV.         .
   2.667      2.1262     31.03  .         .         .         .QV       .
   2.750      2.2984     25.01  .         .         .    Q    .    V    .
   2.833      2.4018     15.01  .         .    Q    .         .     V   .
   2.917      2.4750     10.64  .         Q         .         .      V  .
   3.000      2.5317      8.23  .       Q .         .         .       V .
   3.083      2.5660      4.98  .   Q     .         .         .        V.
   3.167      2.5852      2.78  . Q       .         .         .        V.
   3.250      2.5967      1.67  .Q        .         .         .        V.
   3.333      2.6039      1.06  .Q        .         .         .        V.
   3.417      2.6087      0.69  Q         .         .         .        V.
   3.500      2.6115      0.40  Q         .         .         .        V.
   3.583      2.6128      0.20  Q         .         .         .        V.
   3.667      2.6135      0.10  Q         .         .         .        V.
   3.750      2.6139      0.05  Q         .         .         .        V.
   3.833      2.6140      0.02  Q         .         .         .        V.
   3.917      2.6141      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)
```

```
   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
              0%                             235.0
             10%                             165.0
             20%                             115.0
             30%                              75.0
             40%                              45.0
             50%                              35.0
             60%                              20.0
             70%                              20.0
             80%                              15.0
             90%                              10.0


****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      100.0     200.0     300.0     400.0
----------------------------------------------------------------------------
   0.083      0.0090      1.30  Q         .         .         .         .
   0.167      0.0481      5.69  Q         .         .         .         .
   0.250      0.1038      8.09  Q         .         .         .         .
   0.333      0.1750     10.33  VQ        .         .         .         .
   0.417      0.2767     14.77  VQ        .         .         .         .
   0.500      0.4094     19.28  VQ        .         .         .         .
   0.583      0.5779     24.46  V Q       .         .         .         .
   0.667      0.7753     28.66  V Q       .         .         .         .
   0.750      1.0140     34.66  V  Q      .         .         .         .
   0.833      1.2886     39.88  V  Q      .         .         .         .
   0.917      1.5920     44.06  V   Q     .         .         .         .
   1.000      1.9333     49.54  V   Q     .         .         .         .
   1.083      2.3203     56.20  V    Q    .         .         .         .
   1.167      2.7588     63.68  .V    Q   .         .         .         .
   1.250      3.2429     70.29  .V     Q  .         .         .         .
   1.333      3.7707     76.63  .V     Q  .         .         .         .
   1.417      4.3454     83.44  .V      Q .         .         .         .
   1.500      4.9867     93.13  . V      Q.         .         .         .
   1.583      5.6859    101.52  . V       Q         .         .         .
   1.667      6.4357    108.87  . V       Q         .         .         .
   1.750      7.2555    119.04  .  V      .Q        .         .         .
   1.833      8.1558    130.72  .  V      .  Q      .         .         .
   1.917      9.1199    139.99  .  V      .  Q      .         .         .
   2.000     10.1465    149.06  .   V     .   Q     .         .         .
   2.083     11.2714    163.33  .   V     .     Q   .         .         .
   2.167     12.5613    187.29  .    V    .       Q .         .         .
   2.250     14.0452    215.46  .     V   .         .Q        .         .
   2.333     15.6774    237.00  .     V   .         .  Q      .         .
   2.417     17.4437    256.47  .      V  .         .    Q    .         .
   2.500     19.4644    293.41  .       V .         .        Q.         .
   2.583     21.7333    329.45  .        V.         .         . Q       .
   2.667     24.2380    363.68  .         V         .         .     Q   .
   2.750     26.8418    378.07  .         .V        .         .      Q  .
   2.833     29.4484    378.48  .         . V       .         .      Q  .
   2.917     32.1062    385.92  .         .  V      .         .       Q .
   3.000     34.7946    390.36  .         .   V     .         .        Q.
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  3.083     37.4535    386.07  .         .     V   .         .       Q .
  3.167     40.0700    379.91  .         .      V  .         .      Q  .
  3.250     42.6376    372.82  .         .       V .         .      Q  .
  3.333     45.1462    364.24  .         .        V.         .     Q   .
  3.417     47.5875    354.48  .         .         V         .    Q    .
  3.500     49.9561    343.91  .         .         .V        .   Q     .
  3.583     52.2495    333.00  .         .         . V       .  Q      .
  3.667     54.4671    322.00  .         .         .  V      . Q       .
  3.750     56.6030    310.15  .         .         .   V     .Q        .
  3.833     58.6359    295.17  .         .         .    V   Q.         .
  3.917     60.5499    277.92  .         .         .     VQ  .         .
  4.000     62.3479    261.06  .         .         .     Q   .         .
  4.083     64.0345    244.89  .         .         .   Q  V  .         .
  4.167     65.6146    229.44  .         .         . Q     V .         .
  4.250     67.0933    214.71  .         .         .Q      V .         .
  4.333     68.4753    200.67  .         .         Q        V.         .
  4.417     69.7652    187.29  .         .       Q .         V         .
  4.500     70.9513    172.23  .         .      Q  .         V         .
  4.583     72.0155    154.52  .         .    Q    .         V         .
  4.667     72.9732    139.07  .         .  Q      .         .V        .
  4.750     73.8668    129.75  .         . Q       .         .V        .
  4.833     74.7215    124.10  .         . Q       .         . V       .
  4.917     75.5408    118.97  .         .Q        .         . V       .
  5.000     76.3260    114.01  .         .Q        .         . V       .
  5.083     77.0780    109.19  .         Q         .         .  V      .
  5.167     77.7975    104.48  .         Q         .         .  V      .
  5.250     78.4854     99.88  .        Q.         .         .  V      .
  5.333     79.1427     95.43  .        Q.         .         .   V     .
  5.417     79.7704     91.14  .        Q.         .         .   V     .
  5.500     80.3698     87.04  .       Q .         .         .   V     .
  5.583     80.9421     83.10  .       Q .         .         .   V     .
  5.667     81.4885     79.34  .      Q  .         .         .    V    .
  5.750     82.0101     75.74  .      Q  .         .         .    V    .
  5.833     82.5081     72.31  .      Q  .         .         .    V    .
  5.917     82.9836     69.04  .     Q   .         .         .    V    .
  6.000     83.4375     65.91  .     Q   .         .         .    V    .
  6.083     83.8708     62.92  .     Q   .         .         .     V   .
  6.167     84.2846     60.07  .     Q   .         .         .     V   .
  6.250     84.6795     57.35  .    Q    .         .         .     V   .
  6.333     85.0566     54.75  .    Q    .         .         .     V   .
  6.417     85.4166     52.27  .    Q    .         .         .     V   .
  6.500     85.7603     49.90  .   Q     .         .         .     V   .
  6.583     86.0884     47.64  .   Q     .         .         .      V  .
  6.667     86.4017     45.48  .   Q     .         .         .      V  .
  6.750     86.7007     43.42  .   Q     .         .         .      V  .
  6.833     86.9863     41.46  .   Q     .         .         .      V  .
  6.917     87.2588     39.58  .  Q      .         .         .      V  .
  7.000     87.5191     37.79  .  Q      .         .         .      V  .
  7.083     87.7675     36.07  .  Q      .         .         .      V  .
  7.167     88.0047     34.44  .  Q      .         .         .      V  .
  7.250     88.2311     32.88  .  Q      .         .         .      V  .
  7.333     88.4473     31.39  .  Q      .         .         .       V .
  7.417     88.6537     29.97  . Q       .         .         .       V .
  7.500     88.8508     28.61  . Q       .         .         .       V .
  7.583     89.0389     27.31  . Q       .         .         .       V .
  7.667     89.2185     26.08  . Q       .         .         .       V .
  7.750     89.3899     24.90  . Q       .         .         .       V .
  7.833     89.5536     23.77  . Q       .         .         .       V .
  7.917     89.7099     22.69  . Q       .         .         .       V .
  8.000     89.8591     21.66  . Q       .         .         .       V .
  8.083     90.0015     20.68  . Q       .         .         .       V .
  8.167     90.1375     19.74  .Q        .         .         .       V .
  8.250     90.2673     18.85  .Q        .         .         .       V .
```

8.333	90.3913	18.00	.Q	.	.	.	V .
8.417	90.5096	17.18	.Q	.	.	.	V .
8.500	90.6226	16.40	.Q	.	.	.	V .
8.583	90.7304	15.66	.Q	.	.	.	V.
8.667	90.8334	14.95	.Q	.	.	.	V.
8.750	90.9317	14.27	.Q	.	.	.	V.
8.833	91.0255	13.63	.Q	.	.	.	V.
8.917	91.1151	13.01	.Q	.	.	.	V.
9.000	91.2007	12.42	.Q	.	.	.	V.
9.083	91.2823	11.86	.Q	.	.	.	V.
9.167	91.3603	11.32	.Q	.	.	.	V.
9.250	91.4347	10.81	.Q	.	.	.	V.
9.333	91.5058	10.32	.Q	.	.	.	V.
9.417	91.5736	9.85	Q	.	.	.	V.
9.500	91.6384	9.40	Q	.	.	.	V.
9.583	91.7002	8.98	Q	.	.	.	V.
9.667	91.7592	8.57	Q	.	.	.	V.
9.750	91.8156	8.18	Q	.	.	.	V.
9.833	91.8694	7.81	Q	.	.	.	V.
9.917	91.9208	7.46	Q	.	.	.	V.
10.000	91.9698	7.12	Q	.	.	.	V.
10.083	92.0166	6.80	Q	.	.	.	V.
10.167	92.0613	6.49	Q	.	.	.	V.
10.250	92.1040	6.20	Q	.	.	.	V.
10.333	92.1447	5.92	Q	.	.	.	V.
10.417	92.1836	5.65	Q	.	.	.	V.
10.500	92.2207	5.39	Q	.	.	.	V.
10.583	92.2562	5.15	Q	.	.	.	V.
10.667	92.2900	4.91	Q	.	.	.	V.
10.750	92.3223	4.69	Q	.	.	.	V.
10.833	92.3532	4.48	Q	.	.	.	V.
10.917	92.3826	4.28	Q	.	.	.	V.
11.000	92.4108	4.08	Q	.	.	.	V.
11.083	92.4376	3.90	Q	.	.	.	V.
11.167	92.4632	3.72	Q	.	.	.	V.
11.250	92.4877	3.55	Q	.	.	.	V.
11.333	92.5110	3.39	Q	.	.	.	V.
11.417	92.5333	3.24	Q	.	.	.	V.
11.500	92.5546	3.09	Q	.	.	.	V.
11.583	92.5750	2.95	Q	.	.	.	V.
11.667	92.5944	2.82	Q	.	.	.	V.
11.750	92.6129	2.69	Q	.	.	.	V.
11.833	92.6306	2.57	Q	.	.	.	V.
11.917	92.6475	2.45	Q	.	.	.	V.
12.000	92.6636	2.34	Q	.	.	.	V.
12.083	92.6790	2.23	Q	.	.	.	V.
12.167	92.6937	2.13	Q	.	.	.	V.
12.250	92.7077	2.04	Q	.	.	.	V.
12.333	92.7211	1.94	Q	.	.	.	V.
12.417	92.7339	1.86	Q	.	.	.	V.
12.500	92.7461	1.77	Q	.	.	.	V.
12.583	92.7577	1.69	Q	.	.	.	V.
12.667	92.7688	1.62	Q	.	.	.	V.
12.750	92.7795	1.54	Q	.	.	.	V.
12.833	92.7896	1.47	Q	.	.	.	V.
12.917	92.7993	1.41	Q	.	.	.	V.
13.000	92.8085	1.34	Q	.	.	.	V.
13.083	92.8173	1.28	Q	.	.	.	V.
13.167	92.8258	1.22	Q	.	.	.	V.
13.250	92.8338	1.17	Q	.	.	.	V.
13.333	92.8415	1.11	Q	.	.	.	V.
13.417	92.8488	1.06	Q	.	.	.	V.
13.500	92.8558	1.02	Q	.	.	.	V.

13.583	92.8625	0.97	Q	.	.	.	V.
13.667	92.8689	0.93	Q	.	.	.	V.
13.750	92.8750	0.88	Q	.	.	.	V.
13.833	92.8808	0.84	Q	.	.	.	V.
13.917	92.8863	0.81	Q	.	.	.	V.
14.000	92.8916	0.77	Q	.	.	.	V.
14.083	92.8967	0.73	Q	.	.	.	V.
14.167	92.9015	0.70	Q	.	.	.	V.
14.250	92.9061	0.67	Q	.	.	.	V.
14.333	92.9105	0.64	Q	.	.	.	V.
14.417	92.9147	0.61	Q	.	.	.	V.
14.500	92.9187	0.58	Q	.	.	.	V.
14.583	92.9226	0.56	Q	.	.	.	V.
14.667	92.9262	0.53	Q	.	.	.	V.
14.750	92.9297	0.51	Q	.	.	.	V.
14.833	92.9330	0.48	Q	.	.	.	V.
14.917	92.9362	0.46	Q	.	.	.	V.
15.000	92.9393	0.44	Q	.	.	.	V.
15.083	92.9422	0.42	Q	.	.	.	V.
15.167	92.9449	0.40	Q	.	.	.	V.
15.250	92.9476	0.38	Q	.	.	.	V.
15.333	92.9501	0.37	Q	.	.	.	V.
15.417	92.9525	0.35	Q	.	.	.	V.
15.500	92.9548	0.33	Q	.	.	.	V.
15.583	92.9570	0.32	Q	.	.	.	V.
15.667	92.9591	0.30	Q	.	.	.	V.
15.750	92.9611	0.29	Q	.	.	.	V.
15.833	92.9630	0.28	Q	.	.	.	V.
15.917	92.9648	0.26	Q	.	.	.	V.
16.000	92.9666	0.25	Q	.	.	.	V.
16.083	92.9682	0.24	Q	.	.	.	V.
16.167	92.9698	0.23	Q	.	.	.	V.
16.250	92.9713	0.22	Q	.	.	.	V.
16.333	92.9728	0.21	Q	.	.	.	V.
16.417	92.9742	0.20	Q	.	.	.	V.
16.500	92.9755	0.19	Q	.	.	.	V.
16.583	92.9767	0.18	Q	.	.	.	V.
16.667	92.9779	0.17	Q	.	.	.	V.
16.750	92.9791	0.17	Q	.	.	.	V.
16.833	92.9802	0.16	Q	.	.	.	V.
16.917	92.9812	0.15	Q	.	.	.	V.
17.000	92.9822	0.14	Q	.	.	.	V.
17.083	92.9832	0.14	Q	.	.	.	V.
17.167	92.9841	0.13	Q	.	.	.	V.
17.250	92.9850	0.13	Q	.	.	.	V.
17.333	92.9858	0.12	Q	.	.	.	V.
17.417	92.9866	0.11	Q	.	.	.	V.
17.500	92.9873	0.11	Q	.	.	.	V.
17.583	92.9881	0.10	Q	.	.	.	V.
17.667	92.9888	0.10	Q	.	.	.	V.
17.750	92.9894	0.10	Q	.	.	.	V.
17.833	92.9900	0.09	Q	.	.	.	V.
17.917	92.9906	0.09	Q	.	.	.	V.
18.000	92.9912	0.08	Q	.	.	.	V.
18.083	92.9918	0.08	Q	.	.	.	V.
18.167	92.9923	0.08	Q	.	.	.	V.
18.250	92.9928	0.07	Q	.	.	.	V.
18.333	92.9932	0.07	Q	.	.	.	V.
18.417	92.9937	0.07	Q	.	.	.	V.
18.500	92.9941	0.06	Q	.	.	.	V.
18.583	92.9946	0.06	Q	.	.	.	V.
18.667	92.9949	0.06	Q	.	.	.	V.
18.750	92.9953	0.05	Q	.	.	.	V.

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  18.833    92.9957     0.05  Q         .         .         .        V.
  18.917    92.9960     0.05  Q         .         .         .        V.
  19.000    92.9964     0.05  Q         .         .         .        V.
  19.083    92.9967     0.05  Q         .         .         .        V.
  19.167    92.9970     0.04  Q         .         .         .        V.
  19.250    92.9972     0.04  Q         .         .         .        V.
  19.333    92.9975     0.04  Q         .         .         .        V.
  19.417    92.9978     0.04  Q         .         .         .        V.
  19.500    92.9980     0.04  Q         .         .         .        V.
  19.583    92.9983     0.03  Q         .         .         .        V.
  19.667    92.9985     0.03  Q         .         .         .        V.
  19.750    92.9987     0.03  Q         .         .         .        V.
  19.833    92.9989     0.03  Q         .         .         .        V.
  19.917    92.9991     0.03  Q         .         .         .        V.
  20.000    92.9993     0.03  Q         .         .         .        V.
  20.083    92.9995     0.03  Q         .         .         .        V.
  20.167    92.9997     0.02  Q         .         .         .        V.
  20.250    92.9998     0.02  Q         .         .         .        V.
  20.333    93.0000     0.02  Q         .         .         .        V.
  20.417    93.0001     0.02  Q         .         .         .        V.
  20.500    93.0003     0.02  Q         .         .         .        V.
  20.583    93.0004     0.02  Q         .         .         .        V.
  20.667    93.0005     0.02  Q         .         .         .        V.
  20.750    93.0007     0.02  Q         .         .         .        V.
  20.833    93.0008     0.02  Q         .         .         .        V.
  20.917    93.0009     0.02  Q         .         .         .        V.
  21.000    93.0010     0.02  Q         .         .         .        V.
  21.083    93.0011     0.01  Q         .         .         .        V.
  21.167    93.0012     0.01  Q         .         .         .        V.
  21.250    93.0013     0.01  Q         .         .         .        V.
  21.333    93.0014     0.01  Q         .         .         .        V.
  21.417    93.0015     0.01  Q         .         .         .        V.
  21.500    93.0015     0.01  Q         .         .         .        V.
  21.583    93.0016     0.01  Q         .         .         .        V.
  21.667    93.0017     0.01  Q         .         .         .        V.
  21.750    93.0018     0.01  Q         .         .         .        V.
  21.833    93.0018     0.01  Q         .         .         .        V.
  21.917    93.0019     0.01  Q         .         .         .        V.
  22.000    93.0020     0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
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    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1325.0
             10%                             370.0
             20%                             260.0
             30%                             195.0
             40%                             150.0
             50%                             130.0
             60%                             110.0
             70%                              90.0
             80%                              70.0
             90%                              50.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    106.00 TO NODE    105.00 IS CODE = 5.2
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>>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE INTERVALS(Reference: the National Engineering Handbook, Hydrology, Chapter 17, page 17-52, August,1972, U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2447.00
DOWNSTREAM ELEVATION(FT) = 2422.00
CHANNEL LENGTH(FT) = 1430.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 390.36
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 312.26
CHANNEL NORMAL VELOCITY FOR Q = 312.26 CFS = 16.77 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.908

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE UNIT INTERVALS IS CSTAR = 0.999

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	1.30	0.96	0.96
0.167	5.69	4.55	4.55
0.250	8.09	7.47	7.47
0.333	10.33	9.75	9.75
0.417	14.77	13.62	13.62
0.500	19.28	18.11	18.11
0.583	24.46	23.12	23.12
0.667	28.66	27.57	27.57
0.750	34.66	33.10	33.10
0.833	39.88	38.53	38.53
0.917	44.06	42.98	42.98
1.000	49.54	48.12	48.12
1.083	56.20	54.47	54.47
1.167	63.68	61.74	61.74
1.250	70.29	68.58	68.58
1.333	76.63	74.99	74.99
1.417	83.44	81.68	81.68
1.500	93.13	90.62	90.62
1.583	101.52	99.35	99.35
1.667	108.87	106.96	106.96
1.750	119.04	116.41	116.41
1.833	130.72	127.69	127.69
1.917	139.99	137.59	137.59
2.000	149.06	146.71	146.71
2.083	163.33	159.63	159.63
2.167	187.29	181.09	181.09
2.250	215.46	208.17	208.17
2.333	237.00	231.42	231.42
2.417	256.47	251.42	251.42
2.500	293.41	283.84	283.84

2.583	329.45	320.11	320.11
2.667	363.68	354.82	354.82
2.750	378.07	374.34	374.34
2.833	378.48	378.37	378.37
2.917	385.92	383.99	383.99
3.000	390.36	389.21	389.21
3.083	386.07	387.18	387.18
3.167	379.91	381.51	381.51
3.250	372.82	374.66	374.66
3.333	364.24	366.46	366.46
3.417	354.48	357.01	357.01
3.500	343.91	346.65	346.65
3.583	333.00	335.82	335.82
3.667	322.00	324.85	324.85
3.750	310.15	313.22	313.22
3.833	295.17	299.05	299.05
3.917	277.92	282.39	282.39
4.000	261.06	265.43	265.43
4.083	244.89	249.08	249.08
4.167	229.44	233.44	233.44
4.250	214.71	218.52	218.52
4.333	200.67	204.31	204.31
4.417	187.29	190.76	190.76
4.500	172.23	176.13	176.13
4.583	154.52	159.10	159.10
4.667	139.07	143.07	143.07
4.750	129.75	132.17	132.17
4.833	124.10	125.56	125.56
4.917	118.97	120.30	120.30
5.000	114.01	115.29	115.29
5.083	109.19	110.43	110.43
5.167	104.48	105.70	105.70
5.250	99.88	101.07	101.07
5.333	95.43	96.58	96.58
5.417	91.14	92.25	92.25
5.500	87.04	88.10	88.10
5.583	83.10	84.12	84.12
5.667	79.34	80.31	80.31
5.750	75.74	76.67	76.67
5.833	72.31	73.20	73.20
5.917	69.04	69.88	69.88
6.000	65.91	66.72	66.72
6.083	62.92	63.70	63.70
6.167	60.07	60.81	60.81
6.250	57.35	58.05	58.05
6.333	54.75	55.42	55.42
6.417	52.27	52.91	52.91
6.500	49.90	50.52	50.52
6.583	47.64	48.23	48.23
6.667	45.48	46.04	46.04
6.750	43.42	43.96	43.96
6.833	41.46	41.97	41.97
6.917	39.58	40.07	40.07
7.000	37.79	38.25	38.25
7.083	36.07	36.52	36.52
7.167	34.44	34.86	34.86
7.250	32.88	33.28	33.28
7.333	31.39	31.78	31.78
7.417	29.97	30.34	30.34
7.500	28.61	28.96	28.96
7.583	27.31	27.65	27.65
7.667	26.08	26.40	26.40
7.750	24.90	25.20	25.20

7.833	23.77	24.06	24.06
7.917	22.69	22.97	22.97
8.000	21.66	21.93	21.93
8.083	20.68	20.94	20.94
8.167	19.74	19.99	19.99
8.250	18.85	19.08	19.08
8.333	18.00	18.22	18.22
8.417	17.18	17.39	17.39
8.500	16.40	16.60	16.60
8.583	15.66	15.85	15.85
8.667	14.95	15.13	15.13
8.750	14.27	14.45	14.45
8.833	13.63	13.79	13.79
8.917	13.01	13.17	13.17
9.000	12.42	12.57	12.57
9.083	11.86	12.00	12.00
9.167	11.32	11.46	11.46
9.250	10.81	10.94	10.94
9.333	10.32	10.44	10.44
9.417	9.85	9.97	9.97
9.500	9.40	9.52	9.52
9.583	8.98	9.09	9.09
9.667	8.57	8.68	8.68
9.750	8.18	8.28	8.28
9.833	7.81	7.91	7.91
9.917	7.46	7.55	7.55
10.000	7.12	7.21	7.21
10.083	6.80	6.88	6.88
10.167	6.49	6.57	6.57
10.250	6.20	6.27	6.27
10.333	5.92	5.99	5.99
10.417	5.65	5.72	5.72
10.500	5.39	5.46	5.46
10.583	5.15	5.21	5.21
10.667	4.91	4.97	4.97
10.750	4.69	4.75	4.75
10.833	4.48	4.53	4.53
10.917	4.28	4.33	4.33
11.000	4.08	4.13	4.13
11.083	3.90	3.95	3.95
11.167	3.72	3.77	3.77
11.250	3.55	3.60	3.60
11.333	3.39	3.43	3.43
11.417	3.24	3.28	3.28
11.500	3.09	3.13	3.13
11.583	2.95	2.99	2.99
11.667	2.82	2.85	2.85
11.750	2.69	2.72	2.72
11.833	2.57	2.60	2.60
11.917	2.45	2.48	2.48
12.000	2.34	2.37	2.37
12.083	2.23	2.26	2.26
12.167	2.13	2.16	2.16
12.250	2.04	2.06	2.06
12.333	1.94	1.97	1.97
12.417	1.86	1.88	1.88
12.500	1.77	1.79	1.79
12.583	1.69	1.71	1.71
12.667	1.62	1.64	1.64
12.750	1.54	1.56	1.56
12.833	1.47	1.49	1.49
12.917	1.41	1.42	1.42
13.000	1.34	1.36	1.36

13.083	1.28	1.30	1.30
13.167	1.22	1.24	1.24
13.250	1.17	1.18	1.18
13.333	1.11	1.13	1.13
13.417	1.06	1.08	1.08
13.500	1.02	1.03	1.03
13.583	0.97	0.98	0.98
13.667	0.93	0.94	0.94
13.750	0.88	0.89	0.89
13.833	0.84	0.85	0.85
13.917	0.81	0.82	0.82
14.000	0.77	0.78	0.78
14.083	0.73	0.74	0.74
14.167	0.70	0.71	0.71
14.250	0.67	0.68	0.68
14.333	0.64	0.65	0.65
14.417	0.61	0.62	0.62
14.500	0.58	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.53	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.48	0.49	0.49
14.917	0.46	0.47	0.47
15.000	0.44	0.45	0.45
15.083	0.42	0.43	0.43
15.167	0.40	0.41	0.41
15.250	0.38	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.33	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.30	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.26	0.27	0.27
16.000	0.25	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.18	0.19	0.19
16.667	0.17	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.14	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.11	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.10	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07

```
         18.333        0.07        0.07        0.07
         18.417        0.07        0.07        0.07
         18.500        0.06        0.06        0.06
         18.583        0.06        0.06        0.06
         18.667        0.06        0.06        0.06
         18.750        0.05        0.06        0.06
         18.833        0.05        0.05        0.05
         18.917        0.05        0.05        0.05
         19.000        0.05        0.05        0.05
         19.083        0.05        0.05        0.05
         19.167        0.04        0.04        0.04
         19.250        0.04        0.04        0.04
         19.333        0.04        0.04        0.04
         19.417        0.04        0.04        0.04
         19.500        0.04        0.04        0.04
         19.583        0.03        0.03        0.03
         19.667        0.03        0.03        0.03
         19.750        0.03        0.03        0.03
         19.833        0.03        0.03        0.03
         19.917        0.03        0.03        0.03
         20.000        0.03        0.03        0.03
         20.083        0.03        0.03        0.03
         20.167        0.02        0.03        0.03
         20.250        0.02        0.02        0.02
         20.333        0.02        0.02        0.02
         20.417        0.02        0.02        0.02
         20.500        0.02        0.02        0.02
         20.583        0.02        0.02        0.02
         20.667        0.02        0.02        0.02
         20.750        0.02        0.02        0.02
         20.833        0.02        0.02        0.02
         20.917        0.02        0.02        0.02
         21.000        0.02        0.02        0.02
         21.083        0.01        0.02        0.02
         21.167        0.01        0.01        0.01
         21.250        0.01        0.01        0.01
         21.333        0.01        0.01        0.01
         21.417        0.01        0.01        0.01
         21.500        0.01        0.01        0.01
         21.583        0.01        0.01        0.01
         21.667        0.01        0.01        0.01
         21.750        0.01        0.01        0.01
         21.833        0.01        0.01        0.01
         21.917        0.01        0.01        0.01
         22.000        0.01        0.01        0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =     93.003 AF
    OUTFLOW VOLUME =     93.003 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERCOURSE LENGTH =    5250.000 FEET
         LENGTH FROM CONCENTRATION POINT TO CENTROID =    2713.000 FEET
         ELEVATION VARIATION ALONG WATERCOURSE =      77.000 FEET
```

BASIN FACTOR = 0.025
WATERSHED AREA = 147.100 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
WATERCOURSE "LAG" TIME = 0.203 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.137
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
USER-ENTERED RAINFALL = 2.25 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9994

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 40.964

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	4.421	78.653
2	22.756	326.172
3	50.537	494.222
4	67.151	295.569
5	75.644	151.079
6	81.046	96.113
7	84.952	69.478
8	87.882	52.119
9	90.206	41.358
10	92.082	33.371
11	93.624	27.422
12	94.914	22.960
13	96.046	20.128
14	96.874	14.733
15	97.668	14.121
16	98.172	8.969
17	98.466	5.228
18	98.760	5.232
19	99.054	5.228
20	99.348	5.228
21	99.641	5.228
22	99.935	5.228
23	100.000	1.149

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0114	0.0178
2	0.0292	0.0114	0.0178
3	0.0247	0.0114	0.0133
4	0.0337	0.0114	0.0223
5	0.0337	0.0114	0.0223
6	0.0405	0.0114	0.0290
7	0.0337	0.0114	0.0223
8	0.0405	0.0114	0.0290
9	0.0405	0.0114	0.0290
10	0.0337	0.0114	0.0223
11	0.0360	0.0114	0.0245
12	0.0405	0.0114	0.0290
13	0.0495	0.0114	0.0380
14	0.0495	0.0114	0.0380
15	0.0495	0.0114	0.0380
16	0.0450	0.0114	0.0335
17	0.0585	0.0114	0.0470
18	0.0607	0.0114	0.0493
19	0.0540	0.0114	0.0425
20	0.0607	0.0114	0.0493
21	0.0742	0.0114	0.0628
22	0.0697	0.0114	0.0583
23	0.0652	0.0114	0.0538
24	0.0675	0.0114	0.0560
25	0.0697	0.0114	0.0583
26	0.0944	0.0114	0.0830
27	0.1124	0.0114	0.1010
28	0.0787	0.0114	0.0673
29	0.1529	0.0114	0.1415
30	0.1642	0.0114	0.1527
31	0.1844	0.0114	0.1730
32	0.1327	0.0114	0.1212
33	0.0450	0.0114	0.0335
34	0.0405	0.0114	0.0290
35	0.0405	0.0114	0.0290
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.41
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.84

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 4.9881
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 22.5655

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============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       75.0     150.0     225.0     300.0
----------------------------------------------------------------------------
   0.083     0.0096      1.40  Q         .         .         .         .
   0.167     0.0593      7.21  Q         .         .         .         .
   0.250     0.1670     15.65  V Q       .         .         .         .
   0.333     0.3058     20.15  V Q       .         .         .         .
   0.417     0.4680     23.55  V  Q      .         .         .         .
   0.500     0.6671     28.91  .V Q      .         .         .         .
   0.583     0.8999     33.79  .V  Q     .         .         .         .
   0.667     1.1568     37.31  . V Q     .         .         .         .
   0.750     1.4286     39.46  . V  Q    .         .         .         .
   0.833     1.7197     42.27  .  V Q    .         .         .         .
   0.917     2.0134     42.64  .  V Q    .         .         .         .
   1.000     2.3018     41.87  .   VQ    .         .         .         .
   1.083     2.6064     44.23  .   VQ    .         .         .         .
   1.167     2.9496     49.83  .    VQ   .         .         .         .
   1.250     3.3350     55.96  .    V Q  .         .         .         .
   1.333     3.7427     59.21  .     VQ  .         .         .         .
   1.417     4.1611     60.75  .      VQ .         .         .         .
   1.500     4.6051     64.47  .       Q .         .         .         .
   1.583     5.0942     71.01  .        Q.         .         .         .
   1.667     5.6076     74.55  .        Q.         .         .         .
   1.750     6.1404     77.36  .         Q         .         .         .
   1.833     6.7230     84.60  .         .Q        .         .         .
   1.917     7.3548     91.74  .         . QV      .         .         .
   2.000     7.9991     93.55  .         . Q V     .         .         .
   2.083     8.6461     93.95  .         . Q  V    .         .         .
   2.167     9.3196     97.79  .         .  Q  V   .         .         .
   2.250    10.0735    109.47  .         .   Q  V  .         .         .
   2.333    10.9433    126.29  .         .     Q  V.         .         .
   2.417    11.8955    138.27  .         .       Q .V        .         .
   2.500    12.9727    156.41  .         .         Q V       .         .
   2.583    14.3090    194.02  .         .         .    Q    .         .
   2.667    15.8440    222.89  .         .         .       VQ.         .
   2.750    17.3820    223.31  .         .         .        QV         .
   2.833    18.6458    183.51  .         .         .   Q     .  V      .
   2.917    19.5601    132.76  .         .       Q .         .   V     .
   3.000    20.2603    101.67  .         .  Q      .         .    V    .
   3.083    20.8073     79.42  .         Q         .         .     V   .
   3.167    21.2042     57.63  .      Q  .         .         .      V  .
   3.250    21.4919     41.78  .    Q    .         .         .       V .
   3.333    21.7129     32.08  .   Q     .         .         .       V .
   3.417    21.8898     25.69  .  Q      .         .         .       V .
   3.500    22.0318     20.62  . Q       .         .         .        V.
   3.583    22.1473     16.78  . Q       .         .         .        V.
   3.667    22.2402     13.49  .Q        .         .         .        V.
   3.750    22.3137     10.68  .Q        .         .         .        V.
   3.833    22.3717      8.42  .Q        .         .         .        V.
   3.917    22.4168      6.55  Q         .         .         .        V.
   4.000    22.4535      5.33  Q         .         .         .        V.
   4.083    22.4844      4.49  Q         .         .         .        V.
   4.167    22.5108      3.84  Q         .         .         .        V.
   4.250    22.5318      3.04  Q         .         .         .        V.
   4.333    22.5471      2.23  Q         .         .         .        V.
```

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    4.417     22.5564      1.35  Q         .         .         .        V.
    4.500     22.5609      0.65  Q         .         .         .        V.
    4.583     22.5635      0.38  Q         .         .         .        V.
    4.667     22.5650      0.22  Q         .         .         .        V.
    4.750     22.5655      0.07  Q         .         .         .        V.
    4.833     22.5655      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                             290.0
             10%                             185.0
             20%                             125.0
             30%                              95.0
             40%                              70.0
             50%                              40.0
             60%                              30.0
             70%                              25.0
             80%                              20.0
             90%                              10.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
 ----------------------------------------------------------------------------
   >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
 ============================================================================

             STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
         (Note: Time indicated is at END of Each Unit Intervals)
 ----------------------------------------------------------------------------
  TIME(HRS) VOLUME(AF)   Q(CFS) 0.       150.0     300.0     450.0     600.0
 ----------------------------------------------------------------------------
    0.083      0.0163      2.36  Q         .         .         .         .
    0.167      0.0973     11.76  Q         .         .         .         .
    0.250      0.2565     23.11  VQ        .         .         .         .
    0.333      0.4624     29.90  VQ        .         .         .         .
    0.417      0.7184     37.17  V Q       .         .         .         .
    0.500      1.0422     47.02  V  Q      .         .         .         .
    0.583      1.4341     56.91  V  Q      .         .         .         .
    0.667      1.8810     64.88  V   Q     .         .         .         .
    0.750      2.3807     72.57  V   Q     .         .         .         .
    0.833      2.9372     80.80  .V   Q    .         .         .         .
    0.917      3.5269     85.62  .V   Q    .         .         .         .
    1.000      4.1467     89.99  .V   Q    .         .         .         .
    1.083      4.8264     98.70  .V    Q   .         .         .         .
    1.167      5.5948    111.57  .V     Q  .         .         .         .
    1.250      6.4525    124.54  . V     Q .         .         .         .
    1.333      7.3767    134.20  . V     Q .         .         .         .
    1.417      8.3577    142.43  . V      Q.         .         .         .
    1.500      9.4258    155.09  .  V      Q         .         .         .
    1.583     10.5990    170.35  .  V      .Q        .         .         .
    1.667     11.8491    181.51  .   V     . Q       .         .         .
    1.750     13.1836    193.77  .   V     . Q       .         .         .
    1.833     14.6456    212.29  .    V    .   Q     .         .         .
    1.917     16.2250    229.33  .    V    .    Q    .         .         .
    2.000     17.8797    240.26  .     V   .     Q   .         .         .
    2.083     19.6261    253.58  .     V   .     Q   .         .         .
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    2.167     21.5468    278.88  .      V  .       Q .         .         .
    2.250     23.7343    317.63  .       V .         .Q        .         .
    2.333     26.1979    357.71  .        V.         .  Q      .         .
    2.417     28.8817    389.69  .        V.         .    Q    .         .
    2.500     31.9138    440.25  .         .V        .        Q.         .
    2.583     35.4546    514.14  .         . V       .         .   Q     .
    2.667     39.4333    577.70  .         .  V      .         .       Q .
    2.750     43.5493    597.65  .         .    V    .         .        Q.
    2.833     47.4190    561.88  .         .     V   .         .      Q  .
    2.917     50.9779    516.75  .         .      V  .         .   Q     .
    3.000     54.3586    490.88  .         .       V .         . Q       .
    3.083     57.5721    466.60  .         .        V.         .Q        .
    3.167     60.5964    439.13  .         .         V        Q.         .
    3.250     63.4645    416.44  .         .         .V     Q  .         .
    3.333     66.2092    398.54  .         .         . V   Q   .         .
    3.417     68.8449    382.70  .         .         .  V Q    .         .
    3.500     71.3743    367.27  .         .         .   Q     .         .
    3.583     73.8027    352.60  .         .         .  Q V    .         .
    3.667     76.1328    338.33  .         .         . Q   V   .         .
    3.750     78.3635    323.89  .         .         .Q     V  .         .
    3.833     80.4810    307.46  .         .         Q      V  .         .
    3.917     82.4709    288.94  .         .        Q.       V .         .
    4.000     84.3356    270.76  .         .       Q .        V.         .
    4.083     86.0820    253.57  .         .     Q   .        V.         .
    4.167     87.7161    237.28  .         .    Q    .         V         .
    4.250     89.2420    221.56  .         .   Q     .         V         .
    4.333     90.6644    206.53  .         .  Q      .         .V        .
    4.417     91.9874    192.10  .         . Q       .         .V        .
    4.500     93.2049    176.78  .         .Q        .         . V       .
    4.583     94.3033    159.48  .         Q         .         . V       .
    4.667     95.2901    143.29  .        Q.         .         . V       .
    4.750     96.2008    132.23  .       Q .         .         .  V      .
    4.833     97.0657    125.57  .       Q .         .         .  V      .
    4.917     97.8941    120.30  .       Q .         .         .  V      .
    5.000     98.6882    115.29  .      Q  .         .         .   V     .
    5.083     99.4487    110.43  .      Q  .         .         .   V     .
    5.167    100.1767    105.70  .      Q  .         .         .   V     .
    5.250    100.8728    101.07  .     Q   .         .         .   V     .
    5.333    101.5379     96.58  .     Q   .         .         .    V    .
    5.417    102.1733     92.25  .     Q   .         .         .    V    .
    5.500    102.7801     88.10  .    Q    .         .         .    V    .
    5.583    103.3594     84.12  .    Q    .         .         .    V    .
    5.667    103.9125     80.31  .    Q    .         .         .    V    .
    5.750    104.4405     76.67  .    Q    .         .         .     V   .
    5.833    104.9447     73.20  .   Q     .         .         .     V   .
    5.917    105.4260     69.88  .   Q     .         .         .     V   .
    6.000    105.8855     66.72  .   Q     .         .         .     V   .
    6.083    106.3241     63.70  .   Q     .         .         .     V   .
    6.167    106.7429     60.81  .   Q     .         .         .     V   .
    6.250    107.1428     58.05  .  Q      .         .         .      V  .
    6.333    107.5245     55.42  .  Q      .         .         .      V  .
    6.417    107.8889     52.91  .  Q      .         .         .      V  .
    6.500    108.2368     50.52  .  Q      .         .         .      V  .
    6.583    108.5690     48.23  .  Q      .         .         .      V  .
    6.667    108.8861     46.04  .  Q      .         .         .      V  .
    6.750    109.1888     43.96  . Q       .         .         .      V  .
    6.833    109.4778     41.97  . Q       .         .         .      V  .
    6.917    109.7538     40.07  . Q       .         .         .      V  .
    7.000    110.0172     38.25  . Q       .         .         .       V .
    7.083    110.2687     36.52  . Q       .         .         .       V .
    7.167    110.5088     34.86  . Q       .         .         .       V .
    7.250    110.7380     33.28  . Q       .         .         .       V .
    7.333    110.9569     31.78  . Q       .         .         .       V .
```

7.417	111.1658	30.34	. Q	.	.	.	V .
7.500	111.3653	28.96	.Q	.	.	.	V .
7.583	111.5557	27.65	.Q	.	.	.	V .
7.667	111.7375	26.40	.Q	.	.	.	V .
7.750	111.9110	25.20	.Q	.	.	.	V .
7.833	112.0768	24.06	.Q	.	.	.	V .
7.917	112.2349	22.97	.Q	.	.	.	V .
8.000	112.3860	21.93	.Q	.	.	.	V .
8.083	112.5302	20.94	.Q	.	.	.	V .
8.167	112.6678	19.99	.Q	.	.	.	V .
8.250	112.7992	19.08	.Q	.	.	.	V.
8.333	112.9247	18.22	.Q	.	.	.	V.
8.417	113.0445	17.39	.Q	.	.	.	V.
8.500	113.1588	16.60	.Q	.	.	.	V.
8.583	113.2680	15.85	.Q	.	.	.	V.
8.667	113.3722	15.13	.Q	.	.	.	V.
8.750	113.4718	14.45	Q	.	.	.	V.
8.833	113.5668	13.79	Q	.	.	.	V.
8.917	113.6575	13.17	Q	.	.	.	V.
9.000	113.7440	12.57	Q	.	.	.	V.
9.083	113.8267	12.00	Q	.	.	.	V.
9.167	113.9056	11.46	Q	.	.	.	V.
9.250	113.9810	10.94	Q	.	.	.	V.
9.333	114.0529	10.44	Q	.	.	.	V.
9.417	114.1216	9.97	Q	.	.	.	V.
9.500	114.1871	9.52	Q	.	.	.	V.
9.583	114.2497	9.09	Q	.	.	.	V.
9.667	114.3095	8.68	Q	.	.	.	V.
9.750	114.3665	8.28	Q	.	.	.	V.
9.833	114.4210	7.91	Q	.	.	.	V.
9.917	114.4730	7.55	Q	.	.	.	V.
10.000	114.5226	7.21	Q	.	.	.	V.
10.083	114.5700	6.88	Q	.	.	.	V.
10.167	114.6153	6.57	Q	.	.	.	V.
10.250	114.6585	6.27	Q	.	.	.	V.
10.333	114.6997	5.99	Q	.	.	.	V.
10.417	114.7391	5.72	Q	.	.	.	V.
10.500	114.7767	5.46	Q	.	.	.	V.
10.583	114.8125	5.21	Q	.	.	.	V.
10.667	114.8468	4.97	Q	.	.	.	V.
10.750	114.8795	4.75	Q	.	.	.	V.
10.833	114.9107	4.53	Q	.	.	.	V.
10.917	114.9405	4.33	Q	.	.	.	V.
11.000	114.9690	4.13	Q	.	.	.	V.
11.083	114.9962	3.95	Q	.	.	.	V.
11.167	115.0221	3.77	Q	.	.	.	V.
11.250	115.0469	3.60	Q	.	.	.	V.
11.333	115.0705	3.43	Q	.	.	.	V.
11.417	115.0931	3.28	Q	.	.	.	V.
11.500	115.1146	3.13	Q	.	.	.	V.
11.583	115.1352	2.99	Q	.	.	.	V.
11.667	115.1549	2.85	Q	.	.	.	V.
11.750	115.1736	2.72	Q	.	.	.	V.
11.833	115.1915	2.60	Q	.	.	.	V.
11.917	115.2086	2.48	Q	.	.	.	V.
12.000	115.2249	2.37	Q	.	.	.	V.
12.083	115.2405	2.26	Q	.	.	.	V.
12.167	115.2554	2.16	Q	.	.	.	V.
12.250	115.2696	2.06	Q	.	.	.	V.
12.333	115.2831	1.97	Q	.	.	.	V.
12.417	115.2961	1.88	Q	.	.	.	V.
12.500	115.3084	1.79	Q	.	.	.	V.
12.583	115.3202	1.71	Q	.	.	.	V.

12.667	115.3315	1.64	Q	.	.	.	V.
12.750	115.3422	1.56	Q	.	.	.	V.
12.833	115.3525	1.49	Q	.	.	.	V.
12.917	115.3623	1.42	Q	.	.	.	V.
13.000	115.3716	1.36	Q	.	.	.	V.
13.083	115.3806	1.30	Q	.	.	.	V.
13.167	115.3891	1.24	Q	.	.	.	V.
13.250	115.3972	1.18	Q	.	.	.	V.
13.333	115.4050	1.13	Q	.	.	.	V.
13.417	115.4124	1.08	Q	.	.	.	V.
13.500	115.4195	1.03	Q	.	.	.	V.
13.583	115.4263	0.98	Q	.	.	.	V.
13.667	115.4327	0.94	Q	.	.	.	V.
13.750	115.4389	0.89	Q	.	.	.	V.
13.833	115.4448	0.85	Q	.	.	.	V.
13.917	115.4504	0.82	Q	.	.	.	V.
14.000	115.4557	0.78	Q	.	.	.	V.
14.083	115.4609	0.74	Q	.	.	.	V.
14.167	115.4658	0.71	Q	.	.	.	V.
14.250	115.4704	0.68	Q	.	.	.	V.
14.333	115.4749	0.65	Q	.	.	.	V.
14.417	115.4791	0.62	Q	.	.	.	V.
14.500	115.4832	0.59	Q	.	.	.	V.
14.583	115.4871	0.56	Q	.	.	.	V.
14.667	115.4908	0.54	Q	.	.	.	V.
14.750	115.4943	0.51	Q	.	.	.	V.
14.833	115.4977	0.49	Q	.	.	.	V.
14.917	115.5009	0.47	Q	.	.	.	V.
15.000	115.5040	0.45	Q	.	.	.	V.
15.083	115.5069	0.43	Q	.	.	.	V.
15.167	115.5097	0.41	Q	.	.	.	V.
15.250	115.5124	0.39	Q	.	.	.	V.
15.333	115.5149	0.37	Q	.	.	.	V.
15.417	115.5174	0.35	Q	.	.	.	V.
15.500	115.5197	0.34	Q	.	.	.	V.
15.583	115.5219	0.32	Q	.	.	.	V.
15.667	115.5240	0.31	Q	.	.	.	V.
15.750	115.5261	0.29	Q	.	.	.	V.
15.833	115.5280	0.28	Q	.	.	.	V.
15.917	115.5299	0.27	Q	.	.	.	V.
16.000	115.5316	0.26	Q	.	.	.	V.
16.083	115.5333	0.24	Q	.	.	.	V.
16.167	115.5349	0.23	Q	.	.	.	V.
16.250	115.5364	0.22	Q	.	.	.	V.
16.333	115.5379	0.21	Q	.	.	.	V.
16.417	115.5393	0.20	Q	.	.	.	V.
16.500	115.5406	0.19	Q	.	.	.	V.
16.583	115.5419	0.19	Q	.	.	.	V.
16.667	115.5431	0.18	Q	.	.	.	V.
16.750	115.5443	0.17	Q	.	.	.	V.
16.833	115.5454	0.16	Q	.	.	.	V.
16.917	115.5465	0.15	Q	.	.	.	V.
17.000	115.5475	0.15	Q	.	.	.	V.
17.083	115.5484	0.14	Q	.	.	.	V.
17.167	115.5493	0.13	Q	.	.	.	V.
17.250	115.5502	0.13	Q	.	.	.	V.
17.333	115.5511	0.12	Q	.	.	.	V.
17.417	115.5519	0.12	Q	.	.	.	V.
17.500	115.5526	0.11	Q	.	.	.	V.
17.583	115.5534	0.11	Q	.	.	.	V.
17.667	115.5541	0.10	Q	.	.	.	V.
17.750	115.5547	0.10	Q	.	.	.	V.
17.833	115.5554	0.09	Q	.	.	.	V.

```
   17.917    115.5560      0.09  Q         .         .         .        V.
   18.000    115.5565      0.08  Q         .         .         .        V.
   18.083    115.5571      0.08  Q         .         .         .        V.
   18.167    115.5576      0.08  Q         .         .         .        V.
   18.250    115.5581      0.07  Q         .         .         .        V.
   18.333    115.5586      0.07  Q         .         .         .        V.
   18.417    115.5591      0.07  Q         .         .         .        V.
   18.500    115.5595      0.06  Q         .         .         .        V.
   18.583    115.5599      0.06  Q         .         .         .        V.
   18.667    115.5603      0.06  Q         .         .         .        V.
   18.750    115.5607      0.06  Q         .         .         .        V.
   18.833    115.5611      0.05  Q         .         .         .        V.
   18.917    115.5614      0.05  Q         .         .         .        V.
   19.000    115.5618      0.05  Q         .         .         .        V.
   19.083    115.5621      0.05  Q         .         .         .        V.
   19.167    115.5624      0.04  Q         .         .         .        V.
   19.250    115.5627      0.04  Q         .         .         .        V.
   19.333    115.5630      0.04  Q         .         .         .        V.
   19.417    115.5632      0.04  Q         .         .         .        V.
   19.500    115.5635      0.04  Q         .         .         .        V.
   19.583    115.5637      0.03  Q         .         .         .        V.
   19.667    115.5639      0.03  Q         .         .         .        V.
   19.750    115.5642      0.03  Q         .         .         .        V.
   19.833    115.5644      0.03  Q         .         .         .        V.
   19.917    115.5646      0.03  Q         .         .         .        V.
   20.000    115.5648      0.03  Q         .         .         .        V.
   20.083    115.5649      0.03  Q         .         .         .        V.
   20.167    115.5651      0.03  Q         .         .         .        V.
   20.250    115.5653      0.02  Q         .         .         .        V.
   20.333    115.5654      0.02  Q         .         .         .        V.
   20.417    115.5656      0.02  Q         .         .         .        V.
   20.500    115.5657      0.02  Q         .         .         .        V.
   20.583    115.5659      0.02  Q         .         .         .        V.
   20.667    115.5660      0.02  Q         .         .         .        V.
   20.750    115.5661      0.02  Q         .         .         .        V.
   20.833    115.5662      0.02  Q         .         .         .        V.
   20.917    115.5664      0.02  Q         .         .         .        V.
   21.000    115.5665      0.02  Q         .         .         .        V.
   21.083    115.5666      0.02  Q         .         .         .        V.
   21.167    115.5667      0.01  Q         .         .         .        V.
   21.250    115.5668      0.01  Q         .         .         .        V.
   21.333    115.5669      0.01  Q         .         .         .        V.
   21.417    115.5669      0.01  Q         .         .         .        V.
   21.500    115.5670      0.01  Q         .         .         .        V.
   21.583    115.5671      0.01  Q         .         .         .        V.
   21.667    115.5672      0.01  Q         .         .         .        V.
   21.750    115.5672      0.01  Q         .         .         .        V.
   21.833    115.5673      0.01  Q         .         .         .        V.
   21.917    115.5674      0.01  Q         .         .         .        V.
   22.000    115.5674      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1325.0
             10%                             335.0
             20%                             225.0
             30%                             170.0
```

```
          40%                              130.0
          50%                              100.0
          60%                               70.0
          70%                               45.0
          80%                               30.0
          90%                               15.0


****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =       7.100 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
  Warning: Watershed Area is less than 10 acres
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.150
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH         UNIT HYDROGRAPH
     NUMBER          MEAN VALUES         ORDINATES(CFS)
----------------------------------------------------------------------------
       1                13.994               12.016
       2                59.664               39.215
       3                78.792               16.425
       4                86.766                6.847
       5                91.428                4.003
       6                94.514                2.650
       7                96.650                1.834
       8                98.044                1.197
       9                98.699                0.562
      10                99.289                0.507
      11                99.716                0.366
      12                99.929                0.183
      13               100.000                0.061
```

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0125	0.0168
2	0.0292	0.0125	0.0168
3	0.0247	0.0124	0.0124
4	0.0337	0.0125	0.0213
5	0.0337	0.0125	0.0213
6	0.0405	0.0125	0.0280
7	0.0337	0.0125	0.0213
8	0.0405	0.0125	0.0280
9	0.0405	0.0125	0.0280
10	0.0337	0.0125	0.0213
11	0.0360	0.0125	0.0235
12	0.0405	0.0125	0.0280
13	0.0495	0.0125	0.0370
14	0.0495	0.0125	0.0370
15	0.0495	0.0125	0.0370
16	0.0450	0.0125	0.0325
17	0.0585	0.0125	0.0460
18	0.0607	0.0125	0.0483
19	0.0540	0.0125	0.0415
20	0.0607	0.0125	0.0483
21	0.0742	0.0125	0.0618
22	0.0697	0.0125	0.0573
23	0.0652	0.0125	0.0528
24	0.0675	0.0125	0.0550
25	0.0697	0.0125	0.0573
26	0.0945	0.0125	0.0820
27	0.1125	0.0125	0.1000
28	0.0787	0.0125	0.0663
29	0.1530	0.0125	0.1405
30	0.1642	0.0125	0.1518
31	0.1845	0.0125	0.1720
32	0.1327	0.0125	0.1203
33	0.0450	0.0125	0.0325
34	0.0405	0.0125	0.0280
35	0.0405	0.0125	0.0280
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.44
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.81

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.2626
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1.0681

```
============================================================================

                        3 - H O U R   S T O R M
                  R U N O F F   H Y D R O G R A P H

============================================================================
                HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        5.0      10.0      15.0      20.0
----------------------------------------------------------------------------
   0.083      0.0014      0.20  Q         .         .         .         .
   0.167      0.0073      0.86  VQ        .         .         .         .
   0.250      0.0147      1.08  V Q       .         .         .         .
   0.333      0.0225      1.13  V Q       .         .         .         .
   0.417      0.0327      1.47  .VQ       .         .         .         .
   0.500      0.0445      1.72  .V Q      .         .         .         .
   0.583      0.0581      1.97  . VQ      .         .         .         .
   0.667      0.0715      1.94  . VQ      .         .         .         .
   0.750      0.0864      2.17  .  VQ     .         .         .         .
   0.833      0.1016      2.20  .  VQ     .         .         .         .
   0.917      0.1154      2.01  .   Q     .         .         .         .
   1.000      0.1297      2.07  .   Q     .         .         .         .
   1.083      0.1460      2.36  .   QV    .         .         .         .
   1.167      0.1652      2.79  .    QV   .         .         .         .
   1.250      0.1857      2.97  .    QV   .         .         .         .
   1.333      0.2063      2.99  .    Q V  .         .         .         .
   1.417      0.2271      3.02  .     Q V .         .         .         .
   1.500      0.2515      3.54  .      Q V.         .         .         .
   1.583      0.2773      3.76  .      Q  V         .         .         .
   1.667      0.3028      3.70  .      Q  .V        .         .         .
   1.750      0.3309      4.08  .       Q . V       .         .         .
   1.833      0.3630      4.66  .        Q.  V      .         .         .
   1.917      0.3954      4.70  .        Q.   V     .         .         .
   2.000      0.4270      4.60  .        Q.    V    .         .         .
   2.083      0.4593      4.68  .        Q.      V  .         .         .
   2.167      0.4944      5.10  .         Q       V .         .         .
   2.250      0.5380      6.34  .         . Q       V         .         .
   2.333      0.5867      7.07  .         .   Q     .V        .         .
   2.417      0.6358      7.12  .         .   Q     .  V      .         .
   2.500      0.7035      9.84  .         .        Q.     V   .         .
   2.583      0.7838     11.66  .         .         .  Q     V.         .
   2.667      0.8698     12.49  .         .         .   Q     . V       .
   2.750      0.9393     10.08  .         .         Q         .    V    .
   2.833      0.9813      6.09  .         . Q       .         .     V   .
   2.917      1.0112      4.35  .       Q .         .         .      V  .
   3.000      1.0345      3.38  .     Q   .         .         .       V .
   3.083      1.0485      2.03  .   Q     .         .         .        V.
   3.167      1.0563      1.13  . Q       .         .         .        V.
   3.250      1.0609      0.68  .Q        .         .         .        V.
   3.333      1.0639      0.43  Q         .         .         .        V.
   3.417      1.0658      0.28  Q         .         .         .        V.
   3.500      1.0670      0.16  Q         .         .         .        V.
   3.583      1.0675      0.08  Q         .         .         .        V.
   3.667      1.0678      0.04  Q         .         .         .        V.
   3.750      1.0680      0.02  Q         .         .         .        V.
   3.833      1.0680      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	230.0
10%	165.0
20%	115.0
30%	80.0
40%	45.0
50%	35.0
60%	20.0
70%	20.0
80%	15.0
90%	10.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0177      2.57  Q         .         .         .         .
   0.167      0.1046     12.62  Q         .         .         .         .
   0.250      0.2712     24.20  VQ        .         .         .         .
   0.333      0.4849     31.03  VQ        .         .         .         .
   0.417      0.7510     38.64  V Q       .         .         .         .
   0.500      1.0867     48.73  V Q       .         .         .         .
   0.583      1.4922     58.89  V  Q      .         .         .         .
   0.667      1.9525     66.83  V  Q      .         .         .         .
   0.750      2.4672     74.73  V   Q     .         .         .         .
   0.833      3.0388     83.00  .V  Q     .         .         .         .
   0.917      3.6423     87.63  .V   Q    .         .         .         .
   1.000      4.2764     92.06  .V   Q    .         .         .         .
   1.083      4.9724    101.06  .V   Q    .         .         .         .
   1.167      5.7600    114.36  .V    Q   .         .         .         .
   1.250      6.6382    127.51  . V    Q  .         .         .         .
   1.333      7.5830    137.19  . V    Q  .         .         .         .
   1.417      8.5848    145.46  . V     Q .         .         .         .
   1.500      9.6772    158.63  .  V     Q.         .         .         .
   1.583     10.8763    174.11  .  V     Q.         .         .         .
   1.667     12.1519    185.21  .   V     Q         .         .         .
   1.750     13.5145    197.84  .   V     .Q        .         .         .
   1.833     15.0086    216.95  .    V    . Q       .         .         .
   1.917     16.6204    234.03  .    V    .  Q      .         .         .
   2.000     18.3068    244.86  .     V   .  Q      .         .         .
   2.083     20.0854    258.26  .     V   .   Q     .         .         .
   2.167     22.0411    283.97  .      V  .     Q   .         .         .
   2.250     24.2724    323.98  .       V .       Q .         .         .
   2.333     26.7846    364.78  .        V.         Q         .         .
   2.417     29.5175    396.81  .         V         . Q       .         .
   2.500     32.6173    450.09  .         .V        .    Q    .         .
   2.583     36.2385    525.80  .         . V       .         Q         .
   2.667     40.3031    590.19  .         .  V      .         .  Q      .
   2.750     44.4886    607.73  .         .    V    .         .   Q     .
   2.833     48.4002    567.97  .         .     V   .         . Q       .
   2.917     51.9891    521.10  .         .      V  .        Q.         .
   3.000     55.3931    494.26  .         .       V .       Q .         .
   3.083     58.6205    468.63  .         .         V     Q   .         .
```

```
      3.167     61.6527    440.27  .         .         .V   Q    .         .
      3.250     64.5254    417.12  .         .         . VQ      .         .
      3.333     67.2732    398.97  .         .         . QV      .         .
      3.417     69.9108    382.98  .         .         .Q V      .         .
      3.500     72.4413    367.43  .         .         Q   V     .         .
      3.583     74.8702    352.68  .         .         Q    V    .         .
      3.667     77.2006    338.38  .         .        Q.     V   .         .
      3.750     79.4314    323.91  .         .       Q .      V  .         .
      3.833     81.5490    307.47  .         .      Q  .      V  .         .
      3.917     83.5390    288.94  .         .     Q   .       V .         .
      4.000     85.4037    270.76  .         .    Q    .        V.         .
      4.083     87.1500    253.57  .         .   Q     .        V.         .
      4.167     88.7842    237.28  .         .  Q      .         V         .
      4.250     90.3101    221.56  .         . Q       .         V         .
      4.333     91.7325    206.53  .         .Q        .         .V        .
      4.417     93.0555    192.10  .         Q         .         .V        .
      4.500     94.2730    176.78  .         Q         .         . V       .
      4.583     95.3714    159.48  .        Q.         .         . V       .
      4.667     96.3582    143.29  .       Q .         .         .  V      .
      4.750     97.2689    132.23  .      Q  .         .         .  V      .
      4.833     98.1337    125.57  .      Q  .         .         .  V      .
      4.917     98.9622    120.30  .     Q   .         .         .  V      .
      5.000     99.7562    115.29  .     Q   .         .         .   V     .
      5.083    100.5168    110.43  .     Q   .         .         .   V     .
      5.167    101.2447    105.70  .     Q   .         .         .   V     .
      5.250    101.9408    101.07  .    Q    .         .         .   V     .
      5.333    102.6060     96.58  .    Q    .         .         .    V    .
      5.417    103.2414     92.25  .    Q    .         .         .    V    .
      5.500    103.8481     88.10  .    Q    .         .         .    V    .
      5.583    104.4274     84.12  .   Q     .         .         .    V    .
      5.667    104.9805     80.31  .   Q     .         .         .     V   .
      5.750    105.5086     76.67  .   Q     .         .         .     V   .
      5.833    106.0127     73.20  .   Q     .         .         .     V   .
      5.917    106.4940     69.88  .  Q      .         .         .     V   .
      6.000    106.9535     66.72  .  Q      .         .         .     V   .
      6.083    107.3922     63.70  .  Q      .         .         .     V   .
      6.167    107.8110     60.81  .  Q      .         .         .     V   .
      6.250    108.2108     58.05  .  Q      .         .         .      V  .
      6.333    108.5925     55.42  .  Q      .         .         .      V  .
      6.417    108.9569     52.91  .  Q      .         .         .      V  .
      6.500    109.3049     50.52  . Q       .         .         .      V  .
      6.583    109.6370     48.23  . Q       .         .         .      V  .
      6.667    109.9541     46.04  . Q       .         .         .      V  .
      6.750    110.2569     43.96  . Q       .         .         .      V  .
      6.833    110.5459     41.97  . Q       .         .         .      V  .
      6.917    110.8218     40.07  . Q       .         .         .       V .
      7.000    111.0853     38.25  . Q       .         .         .       V .
      7.083    111.3367     36.52  . Q       .         .         .       V .
      7.167    111.5769     34.86  .Q        .         .         .       V .
      7.250    111.8061     33.28  .Q        .         .         .       V .
      7.333    112.0249     31.78  .Q        .         .         .       V .
      7.417    112.2338     30.34  .Q        .         .         .       V .
      7.500    112.4333     28.96  .Q        .         .         .       V .
      7.583    112.6237     27.65  .Q        .         .         .       V .
      7.667    112.8055     26.40  .Q        .         .         .       V .
      7.750    112.9791     25.20  .Q        .         .         .       V .
      7.833    113.1448     24.06  .Q        .         .         .       V .
      7.917    113.3030     22.97  .Q        .         .         .       V .
      8.000    113.4540     21.93  .Q        .         .         .       V .
      8.083    113.5982     20.94  .Q        .         .         .       V .
      8.167    113.7359     19.99  .Q        .         .         .        V.
      8.250    113.8673     19.08  .Q        .         .         .        V.
      8.333    113.9928     18.22  .Q        .         .         .        V.
```

8.417	114.1125	17.39	Q	.	.	.	V.
8.500	114.2269	16.60	Q	.	.	.	V.
8.583	114.3361	15.85	Q	.	.	.	V.
8.667	114.4403	15.13	Q	.	.	.	V.
8.750	114.5398	14.45	Q	.	.	.	V.
8.833	114.6348	13.79	Q	.	.	.	V.
8.917	114.7255	13.17	Q	.	.	.	V.
9.000	114.8121	12.57	Q	.	.	.	V.
9.083	114.8948	12.00	Q	.	.	.	V.
9.167	114.9737	11.46	Q	.	.	.	V.
9.250	115.0490	10.94	Q	.	.	.	V.
9.333	115.1210	10.44	Q	.	.	.	V.
9.417	115.1896	9.97	Q	.	.	.	V.
9.500	115.2552	9.52	Q	.	.	.	V.
9.583	115.3178	9.09	Q	.	.	.	V.
9.667	115.3775	8.68	Q	.	.	.	V.
9.750	115.4346	8.28	Q	.	.	.	V.
9.833	115.4890	7.91	Q	.	.	.	V.
9.917	115.5410	7.55	Q	.	.	.	V.
10.000	115.5907	7.21	Q	.	.	.	V.
10.083	115.6381	6.88	Q	.	.	.	V.
10.167	115.6833	6.57	Q	.	.	.	V.
10.250	115.7265	6.27	Q	.	.	.	V.
10.333	115.7678	5.99	Q	.	.	.	V.
10.417	115.8071	5.72	Q	.	.	.	V.
10.500	115.8447	5.46	Q	.	.	.	V.
10.583	115.8806	5.21	Q	.	.	.	V.
10.667	115.9148	4.97	Q	.	.	.	V.
10.750	115.9476	4.75	Q	.	.	.	V.
10.833	115.9788	4.53	Q	.	.	.	V.
10.917	116.0086	4.33	Q	.	.	.	V.
11.000	116.0370	4.13	Q	.	.	.	V.
11.083	116.0642	3.95	Q	.	.	.	V.
11.167	116.0902	3.77	Q	.	.	.	V.
11.250	116.1149	3.60	Q	.	.	.	V.
11.333	116.1386	3.43	Q	.	.	.	V.
11.417	116.1611	3.28	Q	.	.	.	V.
11.500	116.1827	3.13	Q	.	.	.	V.
11.583	116.2033	2.99	Q	.	.	.	V.
11.667	116.2229	2.85	Q	.	.	.	V.
11.750	116.2417	2.72	Q	.	.	.	V.
11.833	116.2596	2.60	Q	.	.	.	V.
11.917	116.2766	2.48	Q	.	.	.	V.
12.000	116.2930	2.37	Q	.	.	.	V.
12.083	116.3085	2.26	Q	.	.	.	V.
12.167	116.3234	2.16	Q	.	.	.	V.
12.250	116.3376	2.06	Q	.	.	.	V.
12.333	116.3512	1.97	Q	.	.	.	V.
12.417	116.3641	1.88	Q	.	.	.	V.
12.500	116.3765	1.79	Q	.	.	.	V.
12.583	116.3883	1.71	Q	.	.	.	V.
12.667	116.3995	1.64	Q	.	.	.	V.
12.750	116.4103	1.56	Q	.	.	.	V.
12.833	116.4205	1.49	Q	.	.	.	V.
12.917	116.4303	1.42	Q	.	.	.	V.
13.000	116.4397	1.36	Q	.	.	.	V.
13.083	116.4486	1.30	Q	.	.	.	V.
13.167	116.4571	1.24	Q	.	.	.	V.
13.250	116.4653	1.18	Q	.	.	.	V.
13.333	116.4731	1.13	Q	.	.	.	V.
13.417	116.4805	1.08	Q	.	.	.	V.
13.500	116.4876	1.03	Q	.	.	.	V.
13.583	116.4943	0.98	Q	.	.	.	V.

13.667	116.5008	0.94	Q	.	.	.	V.
13.750	116.5069	0.89	Q	.	.	.	V.
13.833	116.5128	0.85	Q	.	.	.	V.
13.917	116.5184	0.82	Q	.	.	.	V.
14.000	116.5238	0.78	Q	.	.	.	V.
14.083	116.5289	0.74	Q	.	.	.	V.
14.167	116.5338	0.71	Q	.	.	.	V.
14.250	116.5385	0.68	Q	.	.	.	V.
14.333	116.5429	0.65	Q	.	.	.	V.
14.417	116.5472	0.62	Q	.	.	.	V.
14.500	116.5512	0.59	Q	.	.	.	V.
14.583	116.5551	0.56	Q	.	.	.	V.
14.667	116.5588	0.54	Q	.	.	.	V.
14.750	116.5624	0.51	Q	.	.	.	V.
14.833	116.5657	0.49	Q	.	.	.	V.
14.917	116.5689	0.47	Q	.	.	.	V.
15.000	116.5720	0.45	Q	.	.	.	V.
15.083	116.5750	0.43	Q	.	.	.	V.
15.167	116.5778	0.41	Q	.	.	.	V.
15.250	116.5804	0.39	Q	.	.	.	V.
15.333	116.5830	0.37	Q	.	.	.	V.
15.417	116.5854	0.35	Q	.	.	.	V.
15.500	116.5878	0.34	Q	.	.	.	V.
15.583	116.5900	0.32	Q	.	.	.	V.
15.667	116.5921	0.31	Q	.	.	.	V.
15.750	116.5941	0.29	Q	.	.	.	V.
15.833	116.5961	0.28	Q	.	.	.	V.
15.917	116.5979	0.27	Q	.	.	.	V.
16.000	116.5997	0.26	Q	.	.	.	V.
16.083	116.6014	0.24	Q	.	.	.	V.
16.167	116.6030	0.23	Q	.	.	.	V.
16.250	116.6045	0.22	Q	.	.	.	V.
16.333	116.6060	0.21	Q	.	.	.	V.
16.417	116.6074	0.20	Q	.	.	.	V.
16.500	116.6087	0.19	Q	.	.	.	V.
16.583	116.6100	0.19	Q	.	.	.	V.
16.667	116.6112	0.18	Q	.	.	.	V.
16.750	116.6123	0.17	Q	.	.	.	V.
16.833	116.6134	0.16	Q	.	.	.	V.
16.917	116.6145	0.15	Q	.	.	.	V.
17.000	116.6155	0.15	Q	.	.	.	V.
17.083	116.6165	0.14	Q	.	.	.	V.
17.167	116.6174	0.13	Q	.	.	.	V.
17.250	116.6183	0.13	Q	.	.	.	V.
17.333	116.6191	0.12	Q	.	.	.	V.
17.417	116.6199	0.12	Q	.	.	.	V.
17.500	116.6207	0.11	Q	.	.	.	V.
17.583	116.6214	0.11	Q	.	.	.	V.
17.667	116.6221	0.10	Q	.	.	.	V.
17.750	116.6228	0.10	Q	.	.	.	V.
17.833	116.6234	0.09	Q	.	.	.	V.
17.917	116.6240	0.09	Q	.	.	.	V.
18.000	116.6246	0.08	Q	.	.	.	V.
18.083	116.6252	0.08	Q	.	.	.	V.
18.167	116.6257	0.08	Q	.	.	.	V.
18.250	116.6262	0.07	Q	.	.	.	V.
18.333	116.6267	0.07	Q	.	.	.	V.
18.417	116.6271	0.07	Q	.	.	.	V.
18.500	116.6276	0.06	Q	.	.	.	V.
18.583	116.6280	0.06	Q	.	.	.	V.
18.667	116.6284	0.06	Q	.	.	.	V.
18.750	116.6288	0.06	Q	.	.	.	V.
18.833	116.6291	0.05	Q	.	.	.	V.

```
  18.917    116.6295      0.05  Q         .         .         .        V.
  19.000    116.6298      0.05  Q         .         .         .        V.
  19.083    116.6301      0.05  Q         .         .         .        V.
  19.167    116.6304      0.04  Q         .         .         .        V.
  19.250    116.6307      0.04  Q         .         .         .        V.
  19.333    116.6310      0.04  Q         .         .         .        V.
  19.417    116.6313      0.04  Q         .         .         .        V.
  19.500    116.6315      0.04  Q         .         .         .        V.
  19.583    116.6318      0.03  Q         .         .         .        V.
  19.667    116.6320      0.03  Q         .         .         .        V.
  19.750    116.6322      0.03  Q         .         .         .        V.
  19.833    116.6324      0.03  Q         .         .         .        V.
  19.917    116.6326      0.03  Q         .         .         .        V.
  20.000    116.6328      0.03  Q         .         .         .        V.
  20.083    116.6330      0.03  Q         .         .         .        V.
  20.167    116.6332      0.03  Q         .         .         .        V.
  20.250    116.6333      0.02  Q         .         .         .        V.
  20.333    116.6335      0.02  Q         .         .         .        V.
  20.417    116.6336      0.02  Q         .         .         .        V.
  20.500    116.6338      0.02  Q         .         .         .        V.
  20.583    116.6339      0.02  Q         .         .         .        V.
  20.667    116.6341      0.02  Q         .         .         .        V.
  20.750    116.6342      0.02  Q         .         .         .        V.
  20.833    116.6343      0.02  Q         .         .         .        V.
  20.917    116.6344      0.02  Q         .         .         .        V.
  21.000    116.6345      0.02  Q         .         .         .        V.
  21.083    116.6346      0.02  Q         .         .         .        V.
  21.167    116.6347      0.01  Q         .         .         .        V.
  21.250    116.6348      0.01  Q         .         .         .        V.
  21.333    116.6349      0.01  Q         .         .         .        V.
  21.417    116.6350      0.01  Q         .         .         .        V.
  21.500    116.6351      0.01  Q         .         .         .        V.
  21.583    116.6352      0.01  Q         .         .         .        V.
  21.667    116.6352      0.01  Q         .         .         .        V.
  21.750    116.6353      0.01  Q         .         .         .        V.
  21.833    116.6354      0.01  Q         .         .         .        V.
  21.917    116.6354      0.01  Q         .         .         .        V.
  22.000    116.6355      0.01  Q         .         .         .        V.
------------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1325.0
             10%                             335.0
             20%                             220.0
             30%                             170.0
             40%                             130.0
             50%                             100.0
             60%                              75.0
             70%                              45.0
             80%                              30.0
             90%                              15.0


 ****************************************************************************
   FLOW PROCESS FROM NODE    105.00 TO NODE    104.00 IS CODE = 5.2
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   >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE INTERVALS(Reference: the National Engineering Handbook, Hydrology, Chapter 17, page 17-52, August,1972, U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2422.00
DOWNSTREAM ELEVATION(FT) = 2421.00
CHANNEL LENGTH(FT) = 50.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.73
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.03
CHANNEL NORMAL VELOCITY FOR Q = 432.03 CFS = 19.29 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.919

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.57	2.55	2.55
0.167	12.62	12.54	12.54
0.250	24.20	24.10	24.10
0.333	31.03	30.98	30.98
0.417	38.64	38.58	38.58
0.500	48.73	48.65	48.65
0.583	58.89	58.81	58.81
0.667	66.83	66.77	66.77
0.750	74.73	74.67	74.67
0.833	83.00	82.93	82.93
0.917	87.63	87.60	87.60
1.000	92.06	92.03	92.03
1.083	101.06	100.99	100.99
1.167	114.36	114.26	114.26
1.250	127.51	127.40	127.40
1.333	137.19	137.11	137.11
1.417	145.46	145.39	145.39
1.500	158.63	158.52	158.52
1.583	174.11	173.99	173.99
1.667	185.21	185.12	185.12
1.750	197.84	197.74	197.74
1.833	216.95	216.80	216.80
1.917	234.03	233.89	233.89
2.000	244.86	244.78	244.78
2.083	258.26	258.15	258.15
2.167	283.97	283.77	283.77
2.250	323.98	323.66	323.66
2.333	364.78	364.46	364.46
2.417	396.81	396.55	396.55
2.500	450.09	449.67	449.67
2.583	525.80	525.19	525.19

2.667	590.19	589.68	589.68
2.750	607.73	607.59	607.59
2.833	567.97	568.29	568.29
2.917	521.10	521.48	521.48
3.000	494.26	494.47	494.47
3.083	468.63	468.83	468.83
3.167	440.27	440.49	440.49
3.250	417.12	417.30	417.30
3.333	398.97	399.12	399.12
3.417	382.98	383.11	383.11
3.500	367.43	367.55	367.55
3.583	352.68	352.80	352.80
3.667	338.38	338.49	338.49
3.750	323.91	324.03	324.03
3.833	307.47	307.60	307.60
3.917	288.94	289.09	289.09
4.000	270.76	270.90	270.90
4.083	253.57	253.71	253.71
4.167	237.28	237.41	237.41
4.250	221.56	221.69	221.69
4.333	206.53	206.65	206.65
4.417	192.10	192.22	192.22
4.500	176.78	176.90	176.90
4.583	159.48	159.62	159.62
4.667	143.29	143.42	143.42
4.750	132.23	132.32	132.32
4.833	125.57	125.62	125.62
4.917	120.30	120.34	120.34
5.000	115.29	115.33	115.33
5.083	110.43	110.47	110.47
5.167	105.70	105.73	105.73
5.250	101.07	101.11	101.11
5.333	96.58	96.62	96.62
5.417	92.25	92.29	92.29
5.500	88.10	88.13	88.13
5.583	84.12	84.15	84.15
5.667	80.31	80.34	80.34
5.750	76.67	76.70	76.70
5.833	73.20	73.23	73.23
5.917	69.88	69.91	69.91
6.000	66.72	66.74	66.74
6.083	63.70	63.72	63.72
6.167	60.81	60.83	60.83
6.250	58.05	58.08	58.08
6.333	55.42	55.45	55.45
6.417	52.91	52.93	52.93
6.500	50.52	50.54	50.54
6.583	48.23	48.25	48.25
6.667	46.04	46.06	46.06
6.750	43.96	43.97	43.97
6.833	41.97	41.98	41.98
6.917	40.07	40.08	40.08
7.000	38.25	38.26	38.26
7.083	36.52	36.53	36.53
7.167	34.86	34.88	34.88
7.250	33.28	33.30	33.30
7.333	31.78	31.79	31.79
7.417	30.34	30.35	30.35
7.500	28.96	28.97	28.97
7.583	27.65	27.66	27.66
7.667	26.40	26.41	26.41
7.750	25.20	25.21	25.21
7.833	24.06	24.07	24.07

7.917	22.97	22.98	22.98
8.000	21.93	21.94	21.94
8.083	20.94	20.94	20.94
8.167	19.99	20.00	20.00
8.250	19.08	19.09	19.09
8.333	18.22	18.22	18.22
8.417	17.39	17.40	17.40
8.500	16.60	16.61	16.61
8.583	15.85	15.86	15.86
8.667	15.13	15.14	15.14
8.750	14.45	14.45	14.45
8.833	13.79	13.80	13.80
8.917	13.17	13.17	13.17
9.000	12.57	12.58	12.58
9.083	12.00	12.01	12.01
9.167	11.46	11.46	11.46
9.250	10.94	10.94	10.94
9.333	10.44	10.45	10.45
9.417	9.97	9.97	9.97
9.500	9.52	9.52	9.52
9.583	9.09	9.09	9.09
9.667	8.68	8.68	8.68
9.750	8.28	8.29	8.29
9.833	7.91	7.91	7.91
9.917	7.55	7.55	7.55
10.000	7.21	7.21	7.21
10.083	6.88	6.88	6.88
10.167	6.57	6.57	6.57
10.250	6.27	6.27	6.27
10.333	5.99	5.99	5.99
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.21	5.21
10.667	4.97	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.53	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.13	4.13	4.13
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.43	3.43	3.43
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.85	2.85
11.750	2.72	2.72	2.72
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.79	1.79	1.79
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30

13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.89	0.90	0.90
13.833	0.85	0.85	0.85
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62
14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07

```
         18.417        0.07        0.07        0.07
         18.500        0.06        0.06        0.06
         18.583        0.06        0.06        0.06
         18.667        0.06        0.06        0.06
         18.750        0.06        0.06        0.06
         18.833        0.05        0.05        0.05
         18.917        0.05        0.05        0.05
         19.000        0.05        0.05        0.05
         19.083        0.05        0.05        0.05
         19.167        0.04        0.04        0.04
         19.250        0.04        0.04        0.04
         19.333        0.04        0.04        0.04
         19.417        0.04        0.04        0.04
         19.500        0.04        0.04        0.04
         19.583        0.03        0.03        0.03
         19.667        0.03        0.03        0.03
         19.750        0.03        0.03        0.03
         19.833        0.03        0.03        0.03
         19.917        0.03        0.03        0.03
         20.000        0.03        0.03        0.03
         20.083        0.03        0.03        0.03
         20.167        0.03        0.03        0.03
         20.250        0.02        0.02        0.02
         20.333        0.02        0.02        0.02
         20.417        0.02        0.02        0.02
         20.500        0.02        0.02        0.02
         20.583        0.02        0.02        0.02
         20.667        0.02        0.02        0.02
         20.750        0.02        0.02        0.02
         20.833        0.02        0.02        0.02
         20.917        0.02        0.02        0.02
         21.000        0.02        0.02        0.02
         21.083        0.02        0.02        0.02
         21.167        0.01        0.01        0.01
         21.250        0.01        0.01        0.01
         21.333        0.01        0.01        0.01
         21.417        0.01        0.01        0.01
         21.500        0.01        0.01        0.01
         21.583        0.01        0.01        0.01
         21.667        0.01        0.01        0.01
         21.750        0.01        0.01        0.01
         21.833        0.01        0.01        0.01
         21.917        0.01        0.01        0.01
         22.000        0.01        0.01        0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    995.00 IS CODE = 5.2
----------------------------------------------------------------------------
  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).
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ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 4.00 CHANNEL Z = 1.50
UPSTREAM ELEVATION(FT) = 2421.00
DOWNSTREAM ELEVATION(FT) = 2417.00
CHANNEL LENGTH(FT) = 60.00 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.59
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.02
CHANNEL NORMAL VELOCITY FOR Q = 432.02 CFS = 30.06 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.946

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.55	2.53	2.53
0.167	12.54	12.47	12.47
0.250	24.10	24.03	24.03
0.333	30.98	30.93	30.93
0.417	38.58	38.53	38.53
0.500	48.65	48.59	48.59
0.583	58.81	58.74	58.74
0.667	66.77	66.72	66.72
0.750	74.67	74.62	74.62
0.833	82.93	82.88	82.88
0.917	87.60	87.57	87.57
1.000	92.03	92.00	92.00
1.083	100.99	100.94	100.94
1.167	114.26	114.17	114.17
1.250	127.40	127.32	127.32
1.333	137.11	137.05	137.05
1.417	145.39	145.34	145.34
1.500	158.52	158.44	158.44
1.583	173.99	173.89	173.89
1.667	185.12	185.05	185.05
1.750	197.74	197.66	197.66
1.833	216.80	216.68	216.68
1.917	233.89	233.78	233.78
2.000	244.78	244.71	244.71
2.083	258.15	258.07	258.07
2.167	283.77	283.61	283.61
2.250	323.66	323.41	323.41
2.333	364.46	364.20	364.20
2.417	396.55	396.35	396.35
2.500	449.67	449.34	449.34
2.583	525.19	524.72	524.72
2.667	589.68	589.27	589.27
2.750	607.59	607.48	607.48
2.833	568.29	568.53	568.53
2.917	521.48	521.77	521.77
3.000	494.47	494.64	494.64
3.083	468.83	469.00	469.00
3.167	440.49	440.67	440.67
3.250	417.30	417.45	417.45

3.333	399.12	399.23	399.23
3.417	383.11	383.21	383.21
3.500	367.55	367.65	367.65
3.583	352.80	352.89	352.89
3.667	338.49	338.58	338.58
3.750	324.03	324.12	324.12
3.833	307.60	307.70	307.70
3.917	289.09	289.21	289.21
4.000	270.90	271.01	271.01
4.083	253.71	253.81	253.81
4.167	237.41	237.51	237.51
4.250	221.69	221.78	221.78
4.333	206.65	206.75	206.75
4.417	192.22	192.31	192.31
4.500	176.90	177.00	177.00
4.583	159.62	159.73	159.73
4.667	143.42	143.52	143.52
4.750	132.32	132.39	132.39
4.833	125.62	125.67	125.67
4.917	120.34	120.37	120.37
5.000	115.33	115.36	115.36
5.083	110.47	110.50	110.50
5.167	105.73	105.76	105.76
5.250	101.11	101.14	101.14
5.333	96.62	96.65	96.65
5.417	92.29	92.32	92.32
5.500	88.13	88.16	88.16
5.583	84.15	84.18	84.18
5.667	80.34	80.37	80.37
5.750	76.70	76.72	76.72
5.833	73.23	73.25	73.25
5.917	69.91	69.93	69.93
6.000	66.74	66.76	66.76
6.083	63.72	63.74	63.74
6.167	60.83	60.85	60.85
6.250	58.08	58.09	58.09
6.333	55.45	55.46	55.46
6.417	52.93	52.95	52.95
6.500	50.54	50.55	50.55
6.583	48.25	48.26	48.26
6.667	46.06	46.07	46.07
6.750	43.97	43.99	43.99
6.833	41.98	41.99	41.99
6.917	40.08	40.09	40.09
7.000	38.26	38.28	38.28
7.083	36.53	36.54	36.54
7.167	34.88	34.89	34.89
7.250	33.30	33.31	33.31
7.333	31.79	31.80	31.80
7.417	30.35	30.36	30.36
7.500	28.97	28.98	28.98
7.583	27.66	27.67	27.67
7.667	26.41	26.42	26.42
7.750	25.21	25.22	25.22
7.833	24.07	24.08	24.08
7.917	22.98	22.99	22.99
8.000	21.94	21.94	21.94
8.083	20.94	20.95	20.95
8.167	20.00	20.00	20.00
8.250	19.09	19.09	19.09
8.333	18.22	18.23	18.23
8.417	17.40	17.40	17.40
8.500	16.61	16.62	16.62

8.583	15.86	15.86	15.86
8.667	15.14	15.14	15.14
8.750	14.45	14.46	14.46
8.833	13.80	13.80	13.80
8.917	13.17	13.18	13.18
9.000	12.58	12.58	12.58
9.083	12.01	12.01	12.01
9.167	11.46	11.47	11.47
9.250	10.94	10.95	10.95
9.333	10.45	10.45	10.45
9.417	9.97	9.98	9.98
9.500	9.52	9.53	9.53
9.583	9.09	9.09	9.09
9.667	8.68	8.68	8.68
9.750	8.29	8.29	8.29
9.833	7.91	7.91	7.91
9.917	7.55	7.56	7.56
10.000	7.21	7.21	7.21
10.083	6.88	6.89	6.89
10.167	6.57	6.57	6.57
10.250	6.27	6.28	6.28
10.333	5.99	5.99	5.99
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.21	5.21
10.667	4.98	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.54	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.13	4.14	4.14
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.43	3.44	3.44
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.85	2.85
11.750	2.72	2.72	2.72
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.79	1.80	1.80
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30
13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.90	0.90	0.90

13.833	0.85	0.85	0.85
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62
14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05

```
          19.083         0.05         0.05         0.05
          19.167         0.04         0.04         0.04
          19.250         0.04         0.04         0.04
          19.333         0.04         0.04         0.04
          19.417         0.04         0.04         0.04
          19.500         0.04         0.04         0.04
          19.583         0.03         0.03         0.03
          19.667         0.03         0.03         0.03
          19.750         0.03         0.03         0.03
          19.833         0.03         0.03         0.03
          19.917         0.03         0.03         0.03
          20.000         0.03         0.03         0.03
          20.083         0.03         0.03         0.03
          20.167         0.03         0.03         0.03
          20.250         0.02         0.02         0.02
          20.333         0.02         0.02         0.02
          20.417         0.02         0.02         0.02
          20.500         0.02         0.02         0.02
          20.583         0.02         0.02         0.02
          20.667         0.02         0.02         0.02
          20.750         0.02         0.02         0.02
          20.833         0.02         0.02         0.02
          20.917         0.02         0.02         0.02
          21.000         0.02         0.02         0.02
          21.083         0.02         0.02         0.02
          21.167         0.01         0.01         0.01
          21.250         0.01         0.01         0.01
          21.333         0.01         0.01         0.01
          21.417         0.01         0.01         0.01
          21.500         0.01         0.01         0.01
          21.583         0.01         0.01         0.01
          21.667         0.01         0.01         0.01
          21.750         0.01         0.01         0.01
          21.833         0.01         0.01         0.01
          21.917         0.01         0.01         0.01
          22.000         0.01         0.01         0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    995.00 TO NODE    994.00 IS CODE = 5.2
----------------------------------------------------------------------------
  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    6.00     CHANNEL Z =  0.00
           UPSTREAM ELEVATION(FT) =    2417.00
           DOWNSTREAM ELEVATION(FT) =    2415.00
           CHANNEL LENGTH(FT) =      83.00     MANNING'S FACTOR = 0.015
           CONSTANT LOSS RATE(CFS) =    0.00
```

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 607.48
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 432.01
CHANNEL NORMAL VELOCITY FOR Q = 432.01 CFS = 21.02 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.925

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.53	2.50	2.50
0.167	12.47	12.35	12.35
0.250	24.03	23.89	23.89
0.333	30.93	30.85	30.85
0.417	38.53	38.44	38.44
0.500	48.59	48.47	48.47
0.583	58.74	58.62	58.62
0.667	66.72	66.62	66.62
0.750	74.62	74.53	74.53
0.833	82.88	82.78	82.78
0.917	87.57	87.51	87.51
1.000	92.00	91.95	91.95
1.083	100.94	100.83	100.83
1.167	114.17	114.01	114.01
1.250	127.32	127.16	127.16
1.333	137.05	136.93	136.93
1.417	145.34	145.24	145.24
1.500	158.44	158.28	158.28
1.583	173.89	173.70	173.70
1.667	185.05	184.92	184.92
1.750	197.66	197.51	197.51
1.833	216.68	216.45	216.45
1.917	233.78	233.58	233.58
2.000	244.71	244.58	244.58
2.083	258.07	257.90	257.90
2.167	283.61	283.30	283.30
2.250	323.41	322.92	322.92
2.333	364.20	363.70	363.70
2.417	396.35	395.96	395.96
2.500	449.34	448.69	448.69
2.583	524.72	523.80	523.80
2.667	589.27	588.48	588.48
2.750	607.48	607.26	607.26
2.833	568.53	569.01	569.01
2.917	521.77	522.34	522.34
3.000	494.64	494.97	494.97
3.083	469.00	469.31	469.31
3.167	440.67	441.01	441.01
3.250	417.45	417.73	417.73
3.333	399.23	399.45	399.45
3.417	383.21	383.41	383.41
3.500	367.65	367.84	367.84
3.583	352.89	353.07	353.07
3.667	338.58	338.75	338.75
3.750	324.12	324.29	324.29
3.833	307.70	307.90	307.90
3.917	289.21	289.43	289.43

4.000	271.01	271.24	271.24
4.083	253.81	254.02	254.02
4.167	237.51	237.71	237.71
4.250	221.78	221.98	221.98
4.333	206.75	206.93	206.93
4.417	192.31	192.48	192.48
4.500	177.00	177.19	177.19
4.583	159.73	159.94	159.94
4.667	143.52	143.72	143.72
4.750	132.39	132.53	132.53
4.833	125.67	125.75	125.75
4.917	120.37	120.44	120.44
5.000	115.36	115.43	115.43
5.083	110.50	110.56	110.56
5.167	105.76	105.82	105.82
5.250	101.14	101.19	101.19
5.333	96.65	96.70	96.70
5.417	92.32	92.37	92.37
5.500	88.16	88.21	88.21
5.583	84.18	84.22	84.22
5.667	80.37	80.41	80.41
5.750	76.72	76.77	76.77
5.833	73.25	73.29	73.29
5.917	69.93	69.97	69.97
6.000	66.76	66.80	66.80
6.083	63.74	63.78	63.78
6.167	60.85	60.89	60.89
6.250	58.09	58.13	58.13
6.333	55.46	55.49	55.49
6.417	52.95	52.98	52.98
6.500	50.55	50.58	50.58
6.583	48.26	48.29	48.29
6.667	46.07	46.10	46.10
6.750	43.99	44.01	44.01
6.833	41.99	42.02	42.02
6.917	40.09	40.12	40.12
7.000	38.28	38.30	38.30
7.083	36.54	36.56	36.56
7.167	34.89	34.91	34.91
7.250	33.31	33.33	33.33
7.333	31.80	31.82	31.82
7.417	30.36	30.37	30.37
7.500	28.98	29.00	29.00
7.583	27.67	27.68	27.68
7.667	26.42	26.43	26.43
7.750	25.22	25.23	25.23
7.833	24.08	24.09	24.09
7.917	22.99	23.00	23.00
8.000	21.94	21.96	21.96
8.083	20.95	20.96	20.96
8.167	20.00	20.01	20.01
8.250	19.09	19.11	19.11
8.333	18.23	18.24	18.24
8.417	17.40	17.41	17.41
8.500	16.62	16.63	16.63
8.583	15.86	15.87	15.87
8.667	15.14	15.15	15.15
8.750	14.46	14.47	14.47
8.833	13.80	13.81	13.81
8.917	13.18	13.19	13.19
9.000	12.58	12.59	12.59
9.083	12.01	12.02	12.02
9.167	11.47	11.47	11.47

9.250	10.95	10.95	10.95
9.333	10.45	10.46	10.46
9.417	9.98	9.98	9.98
9.500	9.53	9.53	9.53
9.583	9.09	9.10	9.10
9.667	8.68	8.69	8.69
9.750	8.29	8.29	8.29
9.833	7.91	7.92	7.92
9.917	7.56	7.56	7.56
10.000	7.21	7.22	7.22
10.083	6.89	6.89	6.89
10.167	6.57	6.58	6.58
10.250	6.28	6.28	6.28
10.333	5.99	6.00	6.00
10.417	5.72	5.72	5.72
10.500	5.46	5.46	5.46
10.583	5.21	5.22	5.22
10.667	4.98	4.98	4.98
10.750	4.75	4.75	4.75
10.833	4.54	4.54	4.54
10.917	4.33	4.33	4.33
11.000	4.14	4.14	4.14
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.44	3.44	3.44
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.85	2.86	2.86
11.750	2.72	2.73	2.73
11.833	2.60	2.60	2.60
11.917	2.48	2.48	2.48
12.000	2.37	2.37	2.37
12.083	2.26	2.26	2.26
12.167	2.16	2.16	2.16
12.250	2.06	2.06	2.06
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.80	1.80	1.80
12.583	1.71	1.71	1.71
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.42	1.42
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30
13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.90	0.90	0.90
13.833	0.85	0.86	0.86
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62

14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43
15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03

```
        19.750        0.03        0.03        0.03
        19.833        0.03        0.03        0.03
        19.917        0.03        0.03        0.03
        20.000        0.03        0.03        0.03
        20.083        0.03        0.03        0.03
        20.167        0.03        0.03        0.03
        20.250        0.02        0.02        0.02
        20.333        0.02        0.02        0.02
        20.417        0.02        0.02        0.02
        20.500        0.02        0.02        0.02
        20.583        0.02        0.02        0.02
        20.667        0.02        0.02        0.02
        20.750        0.02        0.02        0.02
        20.833        0.02        0.02        0.02
        20.917        0.02        0.02        0.02
        21.000        0.02        0.02        0.02
        21.083        0.02        0.02        0.02
        21.167        0.01        0.01        0.01
        21.250        0.01        0.01        0.01
        21.333        0.01        0.01        0.01
        21.417        0.01        0.01        0.01
        21.500        0.01        0.01        0.01
        21.583        0.01        0.01        0.01
        21.667        0.01        0.01        0.01
        21.750        0.01        0.01        0.01
        21.833        0.01        0.01        0.01
        21.917        0.01        0.01        0.01
        22.000        0.01        0.01        0.01
============================================================================
  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    994.00 TO NODE    993.00 IS CODE = 5.2
----------------------------------------------------------------------------
  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
============================================================================

         THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
         TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
         INTERVALS(Reference: the National Engineering Handbook,
         Hydrology, Chapter 17, page 17-52, August,1972,
         U.S. Department of Commerce).


         ASSUMED REGULAR CHANNEL INFORMATION:
           BASEWIDTH(FT) =    6.00     CHANNEL Z =  0.00
           UPSTREAM ELEVATION(FT) =    2415.00
           DOWNSTREAM ELEVATION(FT) =    2412.00
           CHANNEL LENGTH(FT) =      97.00     MANNING'S FACTOR = 0.015
           CONSTANT LOSS RATE(CFS) =    0.00


         CHANNEL ROUTING COEFFICIENT ESTIMATED:
           MAXIMUM INFLOW(CFS) =   607.26
           AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW =   432.00
           CHANNEL NORMAL VELOCITY FOR Q =   432.00 CFS =  23.07 FPS
           ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.931

         MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
```

UNIT INTERVALS IS CSTAR = 1.000

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
0.083	2.50	2.47	2.47
0.167	12.35	12.22	12.22
0.250	23.89	23.74	23.74
0.333	30.85	30.76	30.76
0.417	38.44	38.34	38.34
0.500	48.47	48.33	48.33
0.583	58.62	58.49	58.49
0.667	66.62	66.51	66.51
0.750	74.53	74.42	74.42
0.833	82.78	82.67	82.67
0.917	87.51	87.45	87.45
1.000	91.95	91.89	91.89
1.083	100.83	100.71	100.71
1.167	114.01	113.84	113.84
1.250	127.16	126.99	126.99
1.333	136.93	136.80	136.80
1.417	145.24	145.13	145.13
1.500	158.28	158.11	158.11
1.583	173.70	173.50	173.50
1.667	184.92	184.77	184.77
1.750	197.51	197.35	197.35
1.833	216.45	216.20	216.20
1.917	233.58	233.35	233.35
2.000	244.58	244.43	244.43
2.083	257.90	257.73	257.73
2.167	283.30	282.97	282.97
2.250	322.92	322.41	322.41
2.333	363.70	363.17	363.17
2.417	395.96	395.54	395.54
2.500	448.69	448.00	448.00
2.583	523.80	522.82	522.82
2.667	588.48	587.64	587.64
2.750	607.26	607.01	607.01
2.833	569.01	569.51	569.51
2.917	522.34	522.95	522.95
3.000	494.97	495.33	495.33
3.083	469.31	469.64	469.64
3.167	441.01	441.38	441.38
3.250	417.73	418.04	418.04
3.333	399.45	399.69	399.69
3.417	383.41	383.61	383.61
3.500	367.84	368.04	368.04
3.583	353.07	353.26	353.26
3.667	338.75	338.94	338.94
3.750	324.29	324.48	324.48
3.833	307.90	308.12	308.12
3.917	289.43	289.67	289.67
4.000	271.24	271.47	271.47
4.083	254.02	254.25	254.25
4.167	237.71	237.92	237.92
4.250	221.98	222.18	222.18
4.333	206.93	207.13	207.13
4.417	192.48	192.67	192.67
4.500	177.19	177.39	177.39
4.583	159.94	160.16	160.16

4.667	143.72	143.93	143.93
4.750	132.53	132.67	132.67
4.833	125.75	125.84	125.84
4.917	120.44	120.51	120.51
5.000	115.43	115.49	115.49
5.083	110.56	110.63	110.63
5.167	105.82	105.88	105.88
5.250	101.19	101.25	101.25
5.333	96.70	96.76	96.76
5.417	92.37	92.43	92.43
5.500	88.21	88.26	88.26
5.583	84.22	84.28	84.28
5.667	80.41	80.46	80.46
5.750	76.77	76.82	76.82
5.833	73.29	73.34	73.34
5.917	69.97	70.01	70.01
6.000	66.80	66.84	66.84
6.083	63.78	63.81	63.81
6.167	60.89	60.92	60.92
6.250	58.13	58.16	58.16
6.333	55.49	55.53	55.53
6.417	52.98	53.01	53.01
6.500	50.58	50.61	50.61
6.583	48.29	48.32	48.32
6.667	46.10	46.13	46.13
6.750	44.01	44.04	44.04
6.833	42.02	42.05	42.05
6.917	40.12	40.14	40.14
7.000	38.30	38.32	38.32
7.083	36.56	36.59	36.59
7.167	34.91	34.93	34.93
7.250	33.33	33.35	33.35
7.333	31.82	31.84	31.84
7.417	30.37	30.39	30.39
7.500	29.00	29.02	29.02
7.583	27.68	27.70	27.70
7.667	26.43	26.45	26.45
7.750	25.23	25.25	25.25
7.833	24.09	24.10	24.10
7.917	23.00	23.01	23.01
8.000	21.96	21.97	21.97
8.083	20.96	20.98	20.98
8.167	20.01	20.02	20.02
8.250	19.11	19.12	19.12
8.333	18.24	18.25	18.25
8.417	17.41	17.42	17.42
8.500	16.63	16.64	16.64
8.583	15.87	15.88	15.88
8.667	15.15	15.16	15.16
8.750	14.47	14.48	14.48
8.833	13.81	13.82	13.82
8.917	13.19	13.19	13.19
9.000	12.59	12.60	12.60
9.083	12.02	12.03	12.03
9.167	11.47	11.48	11.48
9.250	10.95	10.96	10.96
9.333	10.46	10.46	10.46
9.417	9.98	9.99	9.99
9.500	9.53	9.54	9.54
9.583	9.10	9.11	9.11
9.667	8.69	8.69	8.69
9.750	8.29	8.30	8.30
9.833	7.92	7.92	7.92

9.917	7.56	7.56	7.56
10.000	7.22	7.22	7.22
10.083	6.89	6.89	6.89
10.167	6.58	6.58	6.58
10.250	6.28	6.28	6.28
10.333	6.00	6.00	6.00
10.417	5.72	5.73	5.73
10.500	5.46	5.47	5.47
10.583	5.22	5.22	5.22
10.667	4.98	4.98	4.98
10.750	4.75	4.76	4.76
10.833	4.54	4.54	4.54
10.917	4.33	4.34	4.34
11.000	4.14	4.14	4.14
11.083	3.95	3.95	3.95
11.167	3.77	3.77	3.77
11.250	3.60	3.60	3.60
11.333	3.44	3.44	3.44
11.417	3.28	3.28	3.28
11.500	3.13	3.13	3.13
11.583	2.99	2.99	2.99
11.667	2.86	2.86	2.86
11.750	2.73	2.73	2.73
11.833	2.60	2.60	2.60
11.917	2.48	2.49	2.49
12.000	2.37	2.37	2.37
12.083	2.26	2.27	2.27
12.167	2.16	2.16	2.16
12.250	2.06	2.07	2.07
12.333	1.97	1.97	1.97
12.417	1.88	1.88	1.88
12.500	1.80	1.80	1.80
12.583	1.71	1.72	1.72
12.667	1.64	1.64	1.64
12.750	1.56	1.56	1.56
12.833	1.49	1.49	1.49
12.917	1.42	1.43	1.43
13.000	1.36	1.36	1.36
13.083	1.30	1.30	1.30
13.167	1.24	1.24	1.24
13.250	1.18	1.18	1.18
13.333	1.13	1.13	1.13
13.417	1.08	1.08	1.08
13.500	1.03	1.03	1.03
13.583	0.98	0.98	0.98
13.667	0.94	0.94	0.94
13.750	0.90	0.90	0.90
13.833	0.86	0.86	0.86
13.917	0.82	0.82	0.82
14.000	0.78	0.78	0.78
14.083	0.74	0.74	0.74
14.167	0.71	0.71	0.71
14.250	0.68	0.68	0.68
14.333	0.65	0.65	0.65
14.417	0.62	0.62	0.62
14.500	0.59	0.59	0.59
14.583	0.56	0.56	0.56
14.667	0.54	0.54	0.54
14.750	0.51	0.51	0.51
14.833	0.49	0.49	0.49
14.917	0.47	0.47	0.47
15.000	0.45	0.45	0.45
15.083	0.43	0.43	0.43

15.167	0.41	0.41	0.41
15.250	0.39	0.39	0.39
15.333	0.37	0.37	0.37
15.417	0.35	0.35	0.35
15.500	0.34	0.34	0.34
15.583	0.32	0.32	0.32
15.667	0.31	0.31	0.31
15.750	0.29	0.29	0.29
15.833	0.28	0.28	0.28
15.917	0.27	0.27	0.27
16.000	0.26	0.26	0.26
16.083	0.24	0.24	0.24
16.167	0.23	0.23	0.23
16.250	0.22	0.22	0.22
16.333	0.21	0.21	0.21
16.417	0.20	0.20	0.20
16.500	0.19	0.19	0.19
16.583	0.19	0.19	0.19
16.667	0.18	0.18	0.18
16.750	0.17	0.17	0.17
16.833	0.16	0.16	0.16
16.917	0.15	0.15	0.15
17.000	0.15	0.15	0.15
17.083	0.14	0.14	0.14
17.167	0.13	0.13	0.13
17.250	0.13	0.13	0.13
17.333	0.12	0.12	0.12
17.417	0.12	0.12	0.12
17.500	0.11	0.11	0.11
17.583	0.11	0.11	0.11
17.667	0.10	0.10	0.10
17.750	0.10	0.10	0.10
17.833	0.09	0.09	0.09
17.917	0.09	0.09	0.09
18.000	0.08	0.08	0.08
18.083	0.08	0.08	0.08
18.167	0.08	0.08	0.08
18.250	0.07	0.07	0.07
18.333	0.07	0.07	0.07
18.417	0.07	0.07	0.07
18.500	0.06	0.06	0.06
18.583	0.06	0.06	0.06
18.667	0.06	0.06	0.06
18.750	0.06	0.06	0.06
18.833	0.05	0.05	0.05
18.917	0.05	0.05	0.05
19.000	0.05	0.05	0.05
19.083	0.05	0.05	0.05
19.167	0.04	0.04	0.04
19.250	0.04	0.04	0.04
19.333	0.04	0.04	0.04
19.417	0.04	0.04	0.04
19.500	0.04	0.04	0.04
19.583	0.03	0.03	0.03
19.667	0.03	0.03	0.03
19.750	0.03	0.03	0.03
19.833	0.03	0.03	0.03
19.917	0.03	0.03	0.03
20.000	0.03	0.03	0.03
20.083	0.03	0.03	0.03
20.167	0.03	0.03	0.03
20.250	0.02	0.02	0.02
20.333	0.02	0.02	0.02

20.417	0.02	0.02	0.02
20.500	0.02	0.02	0.02
20.583	0.02	0.02	0.02
20.667	0.02	0.02	0.02
20.750	0.02	0.02	0.02
20.833	0.02	0.02	0.02
20.917	0.02	0.02	0.02
21.000	0.02	0.02	0.02
21.083	0.02	0.02	0.02
21.167	0.01	0.01	0.01
21.250	0.01	0.01	0.01
21.333	0.01	0.01	0.01
21.417	0.01	0.01	0.01
21.500	0.01	0.01	0.01
21.583	0.01	0.01	0.01
21.667	0.01	0.01	0.01
21.750	0.01	0.01	0.01
21.833	0.01	0.01	0.01
21.917	0.01	0.01	0.01
22.000	0.01	0.01	0.01

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  PROCESS SUMMARY OF STORAGE:
    INFLOW  VOLUME =    116.637 AF
    OUTFLOW VOLUME =    116.637 AF
    LOSS    VOLUME =      0.000 AF


****************************************************************************
  FLOW PROCESS FROM NODE    993.00 TO NODE    992.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 1545.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 2412.00
DOWNSTREAM ELEVATION(FT) = 2379.00
PIPE DIAMETER(FT) = 6.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	2.47	0.91	0.00	0.000
0.167	12.22	4.50	0.00	0.000
0.250	23.74	8.73	20.19	0.000
0.333	30.76	11.31	32.53	0.000
0.417	38.34	11.96	35.83	0.000
0.500	48.33	12.74	46.10	0.000
0.583	58.49	13.53	57.43	0.000
0.667	66.51	14.07	64.43	0.000
0.750	74.42	14.55	72.42	0.000

0.833	82.67	15.04	80.72	0.000
0.917	87.45	15.33	86.38	0.000
1.000	91.89	15.60	90.93	0.000
1.083	100.71	16.01	98.67	0.000
1.167	113.84	16.62	110.95	0.000
1.250	126.99	17.19	124.23	0.000
1.333	136.80	17.55	134.71	0.000
1.417	145.13	17.86	143.42	0.000
1.500	158.11	18.33	155.53	0.000
1.583	173.50	18.85	170.53	0.000
1.667	184.77	19.23	182.70	0.000
1.750	197.35	19.53	194.78	0.000
1.833	216.20	19.96	212.45	0.000
1.917	233.35	20.36	230.11	0.000
2.000	244.43	20.61	242.41	0.000
2.083	257.73	20.87	255.19	0.000
2.167	282.97	21.33	278.25	0.000
2.250	322.41	22.12	315.67	0.000
2.333	363.17	22.76	356.06	0.000
2.417	395.54	23.13	389.66	0.000
2.500	448.00	23.80	439.11	0.000
2.583	522.82	24.50	509.85	0.000
2.667	587.64	24.87	575.86	0.000
2.750	607.01	24.92	603.28	0.000
2.833	569.51	24.79	576.63	0.000
2.917	522.95	24.50	531.32	0.000
3.000	495.33	24.30	500.30	0.000
3.083	469.64	24.03	473.96	0.000
3.167	441.38	23.73	446.25	0.000
3.250	418.04	23.43	421.94	0.000
3.333	399.69	23.18	402.78	0.000
3.417	383.61	23.01	386.56	0.000
3.500	368.04	22.83	370.89	0.000
3.583	353.26	22.62	355.86	0.000
3.667	338.94	22.41	341.49	0.000
3.750	324.48	22.16	326.94	0.000
3.833	308.12	21.86	310.96	0.000
3.917	289.67	21.47	292.77	0.000
4.000	271.47	21.11	274.72	0.000
4.083	254.25	20.81	257.54	0.000
4.167	237.92	20.46	240.97	0.000
4.250	222.18	20.09	225.12	0.000
4.333	207.13	19.75	210.06	0.000
4.417	192.67	19.42	195.60	0.000
4.500	177.39	18.98	180.35	0.000
4.583	160.16	18.40	163.45	0.000
4.667	143.93	17.82	147.16	0.000
4.750	132.67	17.40	135.01	0.000
4.833	125.84	17.15	127.31	0.000
4.917	120.51	16.92	121.62	0.000
5.000	115.49	16.69	116.53	0.000
5.083	110.63	16.47	111.66	0.000
5.167	105.88	16.25	106.92	0.000
5.250	101.25	16.04	102.30	0.000
5.333	96.76	15.83	97.80	0.000
5.417	92.43	15.63	93.44	0.000
5.500	88.26	15.38	89.16	0.000
5.583	84.28	15.14	85.16	0.000
5.667	80.46	14.91	81.34	0.000
5.750	76.82	14.69	77.68	0.000
5.833	73.34	14.48	74.19	0.000
5.917	70.01	14.28	70.85	0.000
6.000	66.84	14.09	67.66	0.000

6.083	63.81	13.91	64.62	0.000
6.167	60.92	13.72	61.68	0.000
6.250	58.16	13.50	58.85	0.000
6.333	55.53	13.30	56.21	0.000
6.417	53.01	13.10	53.68	0.000
6.500	50.61	12.91	51.27	0.000
6.583	48.32	12.74	48.96	0.000
6.667	46.13	12.57	46.76	0.000
6.750	44.04	12.40	44.66	0.000
6.833	42.05	12.25	42.65	0.000
6.917	40.14	12.10	40.73	0.000
7.000	38.32	11.96	38.90	0.000
7.083	36.59	11.82	37.15	0.000
7.167	34.93	11.69	35.48	0.000
7.250	33.35	11.57	33.89	0.000
7.333	31.84	11.45	32.36	0.000
7.417	30.39	11.18	30.71	0.000
7.500	29.02	10.67	29.02	0.000
7.583	27.70	10.19	27.70	0.000
7.667	26.45	9.73	26.45	0.000
7.750	25.25	9.29	25.25	0.000
7.833	24.10	8.87	24.10	0.000
7.917	23.01	8.46	23.01	0.000
8.000	21.97	8.08	21.97	0.000
8.083	20.98	7.72	20.98	0.000
8.167	20.02	7.37	20.02	0.000
8.250	19.12	7.03	19.12	0.000
8.333	18.25	6.71	18.25	0.000
8.417	17.42	6.41	17.42	0.000
8.500	16.64	6.12	16.64	0.000
8.583	15.88	5.84	15.88	0.000
8.667	15.16	5.58	15.16	0.000
8.750	14.48	5.32	14.48	0.000
8.833	13.82	5.08	14.00	0.000
8.917	13.19	4.85	13.64	0.000
9.000	12.60	4.63	12.57	0.000
9.083	12.03	4.42	12.00	0.000
9.167	11.48	4.22	11.45	0.000
9.250	10.96	4.03	10.94	0.000
9.333	10.46	3.85	10.44	0.000
9.417	9.99	3.67	9.97	0.000
9.500	9.54	3.51	9.52	0.000
9.583	9.11	3.35	9.08	0.000
9.667	8.69	3.20	8.67	0.000
9.750	8.30	3.05	8.28	0.000
9.833	7.92	2.91	7.91	0.000
9.917	7.56	2.78	7.55	0.000
10.000	7.22	2.66	7.21	0.000
10.083	6.89	2.54	6.88	0.000
10.167	6.58	2.42	6.78	0.000
10.250	6.28	2.31	6.68	0.000
10.333	6.00	2.21	5.96	0.000
10.417	5.73	2.11	5.69	0.000
10.500	5.47	2.01	5.43	0.000
10.583	5.22	1.92	5.18	0.000
10.667	4.98	1.83	4.95	0.000
10.750	4.76	1.75	4.72	0.000
10.833	4.54	1.67	4.51	0.000
10.917	4.34	1.60	4.31	0.000
11.000	4.14	1.52	4.49	0.000
11.083	3.95	1.45	4.17	0.000
11.167	3.77	1.39	3.72	0.000
11.250	3.60	1.33	3.55	0.000

11.333	3.44	1.27	3.39	0.000
11.417	3.28	1.21	3.24	0.000
11.500	3.13	1.15	3.09	0.000
11.583	2.99	1.10	3.19	0.000
11.667	2.86	1.05	3.20	0.000
11.750	2.73	1.00	2.66	0.000
11.833	2.60	0.96	2.54	0.000
11.917	2.49	0.91	2.42	0.000
12.000	2.37	0.87	2.31	0.000
12.083	2.27	0.83	2.57	0.000
12.167	2.16	0.80	2.37	0.000
12.250	2.07	0.76	1.99	0.000
12.333	1.97	0.73	1.90	0.000
12.417	1.88	0.69	1.81	0.000
12.500	1.80	0.66	2.13	0.000
12.583	1.72	0.63	1.86	0.000
12.667	1.64	0.60	1.55	0.000
12.750	1.56	0.58	1.48	0.000
12.833	1.49	0.55	1.61	0.000
12.917	1.43	0.52	1.77	0.000
13.000	1.36	0.50	1.26	0.000
13.083	1.30	0.50	1.20	0.000
13.167	1.24	0.50	1.42	0.000
13.250	1.18	0.50	1.44	0.000
13.333	1.13	0.50	1.02	0.000
13.417	1.08	0.50	0.97	0.000
13.500	1.03	0.50	1.49	0.000
13.583	0.98	0.50	0.93	0.000
13.667	0.94	0.50	0.82	0.000
13.750	0.90	0.50	1.17	0.000
13.833	0.86	0.50	0.97	0.000
13.917	0.82	0.50	1.30	0.000
14.000	0.78	0.50	1.26	0.000
14.083	0.74	0.50	1.20	0.000
14.167	0.71	0.50	1.15	0.000
14.250	0.68	0.50	1.09	0.000
14.333	0.65	0.50	1.05	0.000
14.417	0.62	0.50	1.00	0.000
14.500	0.59	0.50	0.95	0.000
14.583	0.56	0.50	0.91	0.000
14.667	0.54	0.50	0.87	0.000
14.750	0.51	0.50	0.83	0.000
14.833	0.49	0.50	0.79	0.000
14.917	0.47	0.50	0.76	0.000
15.000	0.45	0.50	0.72	0.000
15.083	0.43	0.50	0.69	0.000
15.167	0.41	0.50	0.66	0.000
15.250	0.39	0.50	0.63	0.000
15.333	0.37	0.50	0.60	0.000
15.417	0.35	0.50	0.57	0.000
15.500	0.34	0.50	0.55	0.000
15.583	0.32	0.50	0.52	0.000
15.667	0.31	0.50	0.50	0.000
15.750	0.29	0.50	0.48	0.000
15.833	0.28	0.50	0.45	0.000
15.917	0.27	0.50	0.43	0.000
16.000	0.26	0.50	0.41	0.000
16.083	0.24	0.50	0.39	0.000
16.167	0.23	0.50	0.38	0.000
16.250	0.22	0.50	0.36	0.000
16.333	0.21	0.50	0.34	0.000
16.417	0.20	0.50	0.33	0.000
16.500	0.19	0.50	0.31	0.000

16.583	0.19	0.50	0.30	0.000
16.667	0.18	0.50	0.29	0.000
16.750	0.17	0.50	0.27	0.000
16.833	0.16	0.50	0.26	0.000
16.917	0.15	0.50	0.25	0.000
17.000	0.15	0.50	0.24	0.000
17.083	0.14	0.50	0.23	0.000
17.167	0.13	0.50	0.22	0.000
17.250	0.13	0.50	0.21	0.000
17.333	0.12	0.50	0.20	0.000
17.417	0.12	0.50	0.19	0.000
17.500	0.11	0.50	0.18	0.000
17.583	0.11	0.50	0.17	0.000
17.667	0.10	0.50	0.16	0.000
17.750	0.10	0.50	0.16	0.000
17.833	0.09	0.50	0.15	0.000
17.917	0.09	0.50	0.14	0.000
18.000	0.08	0.50	0.14	0.000
18.083	0.08	0.50	0.13	0.000
18.167	0.08	0.50	0.12	0.000
18.250	0.07	0.50	0.12	0.000
18.333	0.07	0.50	0.11	0.000
18.417	0.07	0.50	0.11	0.000
18.500	0.06	0.50	0.10	0.000
18.583	0.06	0.50	0.10	0.000
18.667	0.06	0.50	0.09	0.000
18.750	0.06	0.50	0.09	0.000
18.833	0.05	0.50	0.09	0.000
18.917	0.05	0.50	0.08	0.000
19.000	0.05	0.50	0.08	0.000
19.083	0.05	0.50	0.07	0.000
19.167	0.04	0.50	0.07	0.000
19.250	0.04	0.50	0.07	0.000
19.333	0.04	0.50	0.06	0.000
19.417	0.04	0.50	0.06	0.000
19.500	0.04	0.50	0.06	0.000
19.583	0.03	0.50	0.06	0.000
19.667	0.03	0.50	0.05	0.000
19.750	0.03	0.50	0.05	0.000
19.833	0.03	0.50	0.05	0.000
19.917	0.03	0.50	0.05	0.000
20.000	0.03	0.50	0.04	0.000
20.083	0.03	0.50	0.04	0.000
20.167	0.03	0.50	0.04	0.000
20.250	0.02	0.50	0.04	0.000
20.333	0.02	0.50	0.04	0.000
20.417	0.02	0.50	0.04	0.000
20.500	0.02	0.50	0.03	0.000
20.583	0.02	0.50	0.03	0.000
20.667	0.02	0.50	0.03	0.000
20.750	0.02	0.50	0.03	0.000
20.833	0.02	0.50	0.03	0.000
20.917	0.02	0.50	0.03	0.000
21.000	0.02	0.50	0.03	0.000
21.083	0.02	0.50	0.02	0.000
21.167	0.01	0.50	0.02	0.000
21.250	0.01	0.50	0.02	0.000
21.333	0.01	0.50	0.02	0.000
21.417	0.01	0.50	0.02	0.000
21.500	0.01	0.50	0.02	0.000
21.583	0.01	0.50	0.02	0.000
21.667	0.01	0.50	0.02	0.000
21.750	0.01	0.50	0.02	0.000

21.833	0.01	0.50	0.02	0.000
21.917	0.01	0.50	0.02	0.000
22.000	0.01	0.50	0.01	0.000
22.083	0.01	0.50	0.01	0.000
22.167	0.01	0.50	0.01	0.000
22.250	0.01	0.50	0.01	0.000
22.333	0.01	0.50	0.01	0.000
22.417	0.01	0.50	0.01	0.000
22.500	0.01	0.50	0.01	0.000
22.583	0.01	0.50	0.01	0.000
22.667	0.01	0.50	0.01	0.000
22.750	0.01	0.50	0.01	0.000
22.833	0.01	0.50	0.01	0.000
22.917	0.01	0.50	0.01	0.000
23.000	0.01	0.50	0.01	0.000
23.083	0.00	0.50	0.01	0.000
23.167	0.00	0.50	0.01	0.000
23.250	0.00	0.50	0.01	0.000
23.333	0.00	0.50	0.01	0.000
23.417	0.00	0.50	0.01	0.000
23.500	0.00	0.50	0.01	0.000
23.583	0.00	0.50	0.01	0.000
23.667	0.00	0.50	0.01	0.000
23.750	0.00	0.50	0.01	0.000
23.833	0.00	0.50	0.01	0.000
23.917	0.00	0.50	0.01	0.000
24.000	0.00	0.50	0.00	0.000

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****************************************************************************
  FLOW PROCESS FROM NODE    992.00 TO NODE    992.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      13.100 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.100 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.080
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
         USER-ENTERED RAINFALL =  2.25 INCHES
         RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  83.333



============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

1	13.994	22.170
2	59.664	72.355
3	78.792	30.305
4	86.766	12.632
5	91.428	7.386
6	94.514	4.890
7	96.650	3.383
8	98.044	2.209
9	98.699	1.037
10	99.289	0.935
11	99.716	0.676
12	99.929	0.338
13	100.000	0.113

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0066	0.0226
2	0.0292	0.0066	0.0226
3	0.0247	0.0066	0.0181
4	0.0337	0.0066	0.0271
5	0.0337	0.0066	0.0271
6	0.0405	0.0066	0.0339
7	0.0337	0.0066	0.0271
8	0.0405	0.0066	0.0339
9	0.0405	0.0066	0.0339
10	0.0337	0.0066	0.0271
11	0.0360	0.0066	0.0294
12	0.0405	0.0066	0.0339
13	0.0495	0.0066	0.0429
14	0.0495	0.0066	0.0429
15	0.0495	0.0066	0.0429
16	0.0450	0.0066	0.0384
17	0.0585	0.0066	0.0519
18	0.0607	0.0066	0.0541
19	0.0540	0.0066	0.0474
20	0.0607	0.0066	0.0541
21	0.0742	0.0066	0.0676
22	0.0697	0.0066	0.0631
23	0.0652	0.0066	0.0586
24	0.0675	0.0066	0.0609
25	0.0697	0.0066	0.0631
26	0.0945	0.0066	0.0879
27	0.1125	0.0066	0.1059
28	0.0787	0.0066	0.0721
29	0.1530	0.0066	0.1464
30	0.1642	0.0066	0.1576
31	0.1845	0.0066	0.1778
32	0.1327	0.0066	0.1261
33	0.0450	0.0066	0.0384
34	0.0405	0.0066	0.0339
35	0.0405	0.0066	0.0339
36	0.0135	0.0066	0.0069

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.24
TOTAL EFFECTIVE RAINFALL(INCHES) = 2.01

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.2610
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2.1940

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============================================================================

                          3 - H O U R   S T O R M
                    R U N O F F   H Y D R O G R A P H

============================================================================
               HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        7.5      15.0      22.5      30.0
----------------------------------------------------------------------------
   0.083      0.0035      0.50  Q         .         .         .         .
   0.167      0.0182      2.14  V Q       .         .         .         .
   0.250      0.0369      2.72  V  Q      .         .         .         .
   0.333      0.0568      2.88  .V Q      .         .         .         .
   0.417      0.0813      3.56  .V  Q     .         .         .         .
   0.500      0.1091      4.04  .V   Q    .         .         .         .
   0.583      0.1404      4.54  . V   Q   .         .         .         .
   0.667      0.1713      4.50  .  V Q    .         .         .         .
   0.750      0.2052      4.92  .  V  Q   .         .         .         .
   0.833      0.2395      4.98  .   V Q   .         .         .         .
   0.917      0.2714      4.64  .   V Q   .         .         .         .
   1.000      0.3041      4.75  .    VQ   .         .         .         .
   1.083      0.3405      5.29  .     VQ  .         .         .         .
   1.167      0.3824      6.08  .     V Q .         .         .         .
   1.250      0.4265      6.41  .      VQ .         .         .         .
   1.333      0.4709      6.45  .       Q .         .         .         .
   1.417      0.5157      6.51  .       QV.         .         .         .
   1.500      0.5671      7.46  .        QV         .         .         .
   1.583      0.6212      7.86  .         QV        .         .         .
   1.667      0.6746      7.75  .         Q V       .         .         .
   1.750      0.7328      8.45  .         .Q V      .         .         .
   1.833      0.7984      9.53  .         . Q V     .         .         .
   1.917      0.8645      9.60  .         . Q  V    .         .         .
   2.000      0.9293      9.41  .         . Q   V   .         .         .
   2.083      0.9951      9.56  .         . Q     V .         .         .
   2.167      1.0663     10.33  .         .  Q     V.         .         .
   2.250      1.1532     12.63  .         .     Q   .V        .         .
   2.333      1.2495     13.97  .         .       Q . V       .         .
   2.417      1.3463     14.06  .         .       Q .   V     .         .
   2.500      1.4777     19.09  .         .         .    QV   .         .
   2.583      1.6323     22.44  .         .         .        Q.         .
   2.667      1.7973     23.96  .         .         .         .QV       .
   2.750      1.9319     19.53  .         .         .     Q   .    V    .
   2.833      2.0157     12.17  .         .     Q   .         .     V   .
   2.917      2.0774      8.96  .         .Q        .         .      V  .
   3.000      2.1258      7.03  .        Q.         .         .       V .
   3.083      2.1542      4.13  .    Q    .         .         .        V.
   3.167      2.1700      2.29  .  Q      .         .         .        V.
   3.250      2.1794      1.38  .Q        .         .         .        V.
   3.333      2.1855      0.88  .Q        .         .         .        V.
   3.417      2.1894      0.57  Q         .         .         .        V.
   3.500      2.1917      0.33  Q         .         .         .        V.
   3.583      2.1929      0.17  Q         .         .         .        V.
   3.667      2.1935      0.09  Q         .         .         .        V.
   3.750      2.1938      0.05  Q         .         .         .        V.
   3.833      2.1939      0.02  Q         .         .         .        V.
   3.917      2.1940      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)
```

```
   Percentile of Estimated              Duration
       Peak Flow Rate                   (minutes)
   =======================              =========
             0%                           235.0
            10%                           175.0
            20%                           130.0
            30%                            90.0
            40%                            50.0
            50%                            40.0
            60%                            20.0
            70%                            20.0
            80%                            15.0
            90%                            10.0


****************************************************************************
  FLOW PROCESS FROM NODE    992.00 TO NODE    992.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0035      0.50  Q         .         .         .         .
   0.167      0.0182      2.14  Q         .         .         .         .
   0.250      0.1759     22.91  VQ        .         .         .         .
   0.333      0.4198     35.42  V Q       .         .         .         .
   0.417      0.6912     39.40  V Q       .         .         .         .
   0.500      1.0365     50.13  V Q       .         .         .         .
   0.583      1.4632     61.97  V  Q      .         .         .         .
   0.667      1.9380     68.93  V  Q      .         .         .         .
   0.750      2.4706     77.34  V   Q     .         .         .         .
   0.833      3.0608     85.70  .V  Q     .         .         .         .
   0.917      3.6876     91.01  .V   Q    .         .         .         .
   1.000      4.3465     95.67  .V   Q    .         .         .         .
   1.083      5.0625    103.96  .V   Q    .         .         .         .
   1.167      5.8684    117.02  .V    Q   .         .         .         .
   1.250      6.7681    130.63  . V    Q  .         .         .         .
   1.333      7.7402    141.15  . V     Q .         .         .         .
   1.417      8.7728    149.92  . V     Q .         .         .         .
   1.500      9.8953    162.99  .  V     Q.         .         .         .
   1.583     11.1238    178.39  .  V      Q         .         .         .
   1.667     12.4354    190.44  .   V     Q         .         .         .
   1.750     13.8351    203.23  .   V     .Q        .         .         .
   1.833     15.3638    221.97  .    V    . Q       .         .         .
   1.917     17.0147    239.71  .    V    .  Q      .         .         .
   2.000     18.7490    251.82  .     V   .   Q     .         .         .
   2.083     20.5723    264.75  .     V   .    Q    .         .         .
   2.167     22.5598    288.58  .      V  .     Q   .         .         .
   2.250     24.8208    328.29  .       V .       Q .         .         .
   2.333     27.3692    370.03  .        V.         .Q        .         .
   2.417     30.1496    403.71  .         V         .  Q      .         .
   2.500     33.3053    458.20  .         .V        .     Q   .         .
   2.583     36.9711    532.29  .         . V       .         Q         .
   2.667     41.1022    599.83  .         .  V      .         .   Q     .
   2.750     45.3915    622.81  .         .    V    .         .    Q    .
   2.833     49.4466    588.80  .         .     V   .         .  Q      .
   2.917     53.1675    540.27  .         .      V  .         Q         .
   3.000     56.6614    507.33  .         .        V.       Q .         .
```

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3.083     59.9541    478.09  .         .         V      Q  .         .
3.167     63.0431    448.53  .         .         .V   Q    .         .
3.250     65.9585    423.31  .         .         . V Q     .         .
3.333     68.7385    403.65  .         .         .  Q      .         .
3.417     71.4046    387.13  .         .         . Q V     .         .
3.500     73.9613    371.22  .         .         .Q  V     .         .
3.583     76.4133    356.03  .         .         Q    V    .         .
3.667     78.7657    341.57  .         .        Q.     V   .         .
3.750     81.0177    326.99  .         .       Q .      V  .         .
3.833     83.1594    310.98  .         .      Q  .      V  .         .
3.917     85.1758    292.78  .         .     Q   .       V .         .
4.000     87.0679    274.73  .         .    Q    .        V.         .
4.083     88.8416    257.54  .         .   Q     .        V.         .
4.167     90.5012    240.97  .         .  Q      .         V         .
4.250     92.0516    225.12  .         . Q       .         V         .
4.333     93.4983    210.06  .         . Q       .         .V        .
4.417     94.8454    195.60  .         .Q        .         .V        .
4.500     96.0874    180.35  .         Q         .         . V       .
4.583     97.2132    163.45  .        Q.         .         . V       .
4.667     98.2266    147.16  .       Q .         .         .  V      .
4.750     99.1565    135.01  .      Q  .         .         .  V      .
4.833    100.0333    127.31  .      Q  .         .         .  V      .
4.917    100.8709    121.62  .     Q   .         .         .  V      .
5.000    101.6735    116.53  .     Q   .         .         .   V     .
5.083    102.4425    111.66  .     Q   .         .         .   V     .
5.167    103.1789    106.92  .     Q   .         .         .   V     .
5.250    103.8834    102.30  .    Q    .         .         .   V     .
5.333    104.5569     97.80  .    Q    .         .         .    V    .
5.417    105.2005     93.44  .    Q    .         .         .    V    .
5.500    105.8145     89.16  .    Q    .         .         .    V    .
5.583    106.4011     85.16  .   Q     .         .         .    V    .
5.667    106.9612     81.34  .   Q     .         .         .     V   .
5.750    107.4962     77.68  .   Q     .         .         .     V   .
5.833    108.0071     74.19  .   Q     .         .         .     V   .
5.917    108.4951     70.85  .   Q     .         .         .     V   .
6.000    108.9611     67.66  .  Q      .         .         .     V   .
6.083    109.4061     64.62  .  Q      .         .         .     V   .
6.167    109.8309     61.68  .  Q      .         .         .     V   .
6.250    110.2362     58.85  .  Q      .         .         .      V  .
6.333    110.6233     56.21  .  Q      .         .         .      V  .
6.417    110.9930     53.68  .  Q      .         .         .      V  .
6.500    111.3461     51.27  . Q       .         .         .      V  .
6.583    111.6833     48.96  . Q       .         .         .      V  .
6.667    112.0053     46.76  . Q       .         .         .      V  .
6.750    112.3129     44.66  . Q       .         .         .      V  .
6.833    112.6067     42.65  . Q       .         .         .      V  .
6.917    112.8872     40.73  . Q       .         .         .      V  .
7.000    113.1551     38.90  . Q       .         .         .       V .
7.083    113.4110     37.15  . Q       .         .         .       V .
7.167    113.6554     35.48  . Q       .         .         .       V .
7.250    113.8888     33.89  .Q        .         .         .       V .
7.333    114.1116     32.36  .Q        .         .         .       V .
7.417    114.3231     30.71  .Q        .         .         .       V .
7.500    114.5230     29.02  .Q        .         .         .       V .
7.583    114.7138     27.70  .Q        .         .         .       V .
7.667    114.8959     26.45  .Q        .         .         .       V .
7.750    115.0698     25.25  .Q        .         .         .       V .
7.833    115.2358     24.10  .Q        .         .         .       V .
7.917    115.3943     23.01  .Q        .         .         .       V .
8.000    115.5456     21.97  .Q        .         .         .       V .
8.083    115.6901     20.98  .Q        .         .         .       V .
8.167    115.8280     20.02  .Q        .         .         .       V .
8.250    115.9596     19.12  .Q        .         .         .        V.
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8.333	116.0854	18.25	.Q	.	.	.	V.
8.417	116.2054	17.42	Q	.	.	.	V.
8.500	116.3199	16.64	Q	.	.	.	V.
8.583	116.4293	15.88	Q	.	.	.	V.
8.667	116.5337	15.16	Q	.	.	.	V.
8.750	116.6334	14.48	Q	.	.	.	V.
8.833	116.7299	14.00	Q	.	.	.	V.
8.917	116.8238	13.64	Q	.	.	.	V.
9.000	116.9103	12.57	Q	.	.	.	V.
9.083	116.9930	12.00	Q	.	.	.	V.
9.167	117.0719	11.45	Q	.	.	.	V.
9.250	117.1472	10.94	Q	.	.	.	V.
9.333	117.2191	10.44	Q	.	.	.	V.
9.417	117.2877	9.97	Q	.	.	.	V.
9.500	117.3533	9.52	Q	.	.	.	V.
9.583	117.4158	9.08	Q	.	.	.	V.
9.667	117.4756	8.67	Q	.	.	.	V.
9.750	117.5326	8.28	Q	.	.	.	V.
9.833	117.5870	7.91	Q	.	.	.	V.
9.917	117.6390	7.55	Q	.	.	.	V.
10.000	117.6886	7.21	Q	.	.	.	V.
10.083	117.7360	6.88	Q	.	.	.	V.
10.167	117.7827	6.78	Q	.	.	.	V.
10.250	117.8287	6.68	Q	.	.	.	V.
10.333	117.8697	5.96	Q	.	.	.	V.
10.417	117.9089	5.69	Q	.	.	.	V.
10.500	117.9463	5.43	Q	.	.	.	V.
10.583	117.9820	5.18	Q	.	.	.	V.
10.667	118.0161	4.95	Q	.	.	.	V.
10.750	118.0486	4.72	Q	.	.	.	V.
10.833	118.0797	4.51	Q	.	.	.	V.
10.917	118.1093	4.31	Q	.	.	.	V.
11.000	118.1402	4.49	Q	.	.	.	V.
11.083	118.1689	4.17	Q	.	.	.	V.
11.167	118.1946	3.72	Q	.	.	.	V.
11.250	118.2190	3.55	Q	.	.	.	V.
11.333	118.2424	3.39	Q	.	.	.	V.
11.417	118.2646	3.24	Q	.	.	.	V.
11.500	118.2859	3.09	Q	.	.	.	V.
11.583	118.3079	3.19	Q	.	.	.	V.
11.667	118.3299	3.20	Q	.	.	.	V.
11.750	118.3482	2.66	Q	.	.	.	V.
11.833	118.3657	2.54	Q	.	.	.	V.
11.917	118.3824	2.42	Q	.	.	.	V.
12.000	118.3984	2.31	Q	.	.	.	V.
12.083	118.4161	2.57	Q	.	.	.	V.
12.167	118.4324	2.37	Q	.	.	.	V.
12.250	118.4461	1.99	Q	.	.	.	V.
12.333	118.4591	1.90	Q	.	.	.	V.
12.417	118.4716	1.81	Q	.	.	.	V.
12.500	118.4863	2.13	Q	.	.	.	V.
12.583	118.4991	1.86	Q	.	.	.	V.
12.667	118.5098	1.55	Q	.	.	.	V.
12.750	118.5199	1.48	Q	.	.	.	V.
12.833	118.5310	1.61	Q	.	.	.	V.
12.917	118.5432	1.77	Q	.	.	.	V.
13.000	118.5519	1.26	Q	.	.	.	V.
13.083	118.5602	1.20	Q	.	.	.	V.
13.167	118.5699	1.42	Q	.	.	.	V.
13.250	118.5799	1.44	Q	.	.	.	V.
13.333	118.5869	1.02	Q	.	.	.	V.
13.417	118.5935	0.97	Q	.	.	.	V.
13.500	118.6038	1.49	Q	.	.	.	V.

13.583	118.6102	0.93	Q	.	.	.	V.
13.667	118.6158	0.82	Q	.	.	.	V.
13.750	118.6239	1.17	Q	.	.	.	V.
13.833	118.6306	0.97	Q	.	.	.	V.
13.917	118.6395	1.30	Q	.	.	.	V.
14.000	118.6482	1.26	Q	.	.	.	V.
14.083	118.6565	1.20	Q	.	.	.	V.
14.167	118.6644	1.15	Q	.	.	.	V.
14.250	118.6719	1.09	Q	.	.	.	V.
14.333	118.6791	1.05	Q	.	.	.	V.
14.417	118.6860	1.00	Q	.	.	.	V.
14.500	118.6926	0.95	Q	.	.	.	V.
14.583	118.6988	0.91	Q	.	.	.	V.
14.667	118.7048	0.87	Q	.	.	.	V.
14.750	118.7105	0.83	Q	.	.	.	V.
14.833	118.7160	0.79	Q	.	.	.	V.
14.917	118.7212	0.76	Q	.	.	.	V.
15.000	118.7261	0.72	Q	.	.	.	V.
15.083	118.7309	0.69	Q	.	.	.	V.
15.167	118.7354	0.66	Q	.	.	.	V.
15.250	118.7397	0.63	Q	.	.	.	V.
15.333	118.7438	0.60	Q	.	.	.	V.
15.417	118.7478	0.57	Q	.	.	.	V.
15.500	118.7515	0.55	Q	.	.	.	V.
15.583	118.7551	0.52	Q	.	.	.	V.
15.667	118.7586	0.50	Q	.	.	.	V.
15.750	118.7618	0.48	Q	.	.	.	V.
15.833	118.7650	0.45	Q	.	.	.	V.
15.917	118.7679	0.43	Q	.	.	.	V.
16.000	118.7708	0.41	Q	.	.	.	V.
16.083	118.7735	0.39	Q	.	.	.	V.
16.167	118.7761	0.38	Q	.	.	.	V.
16.250	118.7786	0.36	Q	.	.	.	V.
16.333	118.7809	0.34	Q	.	.	.	V.
16.417	118.7832	0.33	Q	.	.	.	V.
16.500	118.7854	0.31	Q	.	.	.	V.
16.583	118.7874	0.30	Q	.	.	.	V.
16.667	118.7894	0.29	Q	.	.	.	V.
16.750	118.7913	0.27	Q	.	.	.	V.
16.833	118.7931	0.26	Q	.	.	.	V.
16.917	118.7948	0.25	Q	.	.	.	V.
17.000	118.7964	0.24	Q	.	.	.	V.
17.083	118.7980	0.23	Q	.	.	.	V.
17.167	118.7994	0.22	Q	.	.	.	V.
17.250	118.8009	0.21	Q	.	.	.	V.
17.333	118.8022	0.20	Q	.	.	.	V.
17.417	118.8035	0.19	Q	.	.	.	V.
17.500	118.8048	0.18	Q	.	.	.	V.
17.583	118.8059	0.17	Q	.	.	.	V.
17.667	118.8071	0.16	Q	.	.	.	V.
17.750	118.8081	0.16	Q	.	.	.	V.
17.833	118.8092	0.15	Q	.	.	.	V.
17.917	118.8102	0.14	Q	.	.	.	V.
18.000	118.8111	0.14	Q	.	.	.	V.
18.083	118.8120	0.13	Q	.	.	.	V.
18.167	118.8128	0.12	Q	.	.	.	V.
18.250	118.8137	0.12	Q	.	.	.	V.
18.333	118.8144	0.11	Q	.	.	.	V.
18.417	118.8152	0.11	Q	.	.	.	V.
18.500	118.8159	0.10	Q	.	.	.	V.
18.583	118.8166	0.10	Q	.	.	.	V.
18.667	118.8172	0.09	Q	.	.	.	V.
18.750	118.8178	0.09	Q	.	.	.	V.

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   18.833    118.8184      0.09  Q         .         .         .        V.
   18.917    118.8190      0.08  Q         .         .         .        V.
   19.000    118.8195      0.08  Q         .         .         .        V.
   19.083    118.8200      0.07  Q         .         .         .        V.
   19.167    118.8205      0.07  Q         .         .         .        V.
   19.250    118.8210      0.07  Q         .         .         .        V.
   19.333    118.8214      0.06  Q         .         .         .        V.
   19.417    118.8219      0.06  Q         .         .         .        V.
   19.500    118.8223      0.06  Q         .         .         .        V.
   19.583    118.8226      0.06  Q         .         .         .        V.
   19.667    118.8230      0.05  Q         .         .         .        V.
   19.750    118.8234      0.05  Q         .         .         .        V.
   19.833    118.8237      0.05  Q         .         .         .        V.
   19.917    118.8240      0.05  Q         .         .         .        V.
   20.000    118.8243      0.04  Q         .         .         .        V.
   20.083    118.8246      0.04  Q         .         .         .        V.
   20.167    118.8249      0.04  Q         .         .         .        V.
   20.250    118.8252      0.04  Q         .         .         .        V.
   20.333    118.8254      0.04  Q         .         .         .        V.
   20.417    118.8257      0.04  Q         .         .         .        V.
   20.500    118.8259      0.03  Q         .         .         .        V.
   20.583    118.8261      0.03  Q         .         .         .        V.
   20.667    118.8263      0.03  Q         .         .         .        V.
   20.750    118.8265      0.03  Q         .         .         .        V.
   20.833    118.8267      0.03  Q         .         .         .        V.
   20.917    118.8269      0.03  Q         .         .         .        V.
   21.000    118.8271      0.03  Q         .         .         .        V.
   21.083    118.8273      0.02  Q         .         .         .        V.
   21.167    118.8274      0.02  Q         .         .         .        V.
   21.250    118.8276      0.02  Q         .         .         .        V.
   21.333    118.8277      0.02  Q         .         .         .        V.
   21.417    118.8279      0.02  Q         .         .         .        V.
   21.500    118.8280      0.02  Q         .         .         .        V.
   21.583    118.8281      0.02  Q         .         .         .        V.
   21.667    118.8282      0.02  Q         .         .         .        V.
   21.750    118.8284      0.02  Q         .         .         .        V.
   21.833    118.8285      0.02  Q         .         .         .        V.
   21.917    118.8286      0.02  Q         .         .         .        V.
   22.000    118.8287      0.01  Q         .         .         .        V.
   22.083    118.8288      0.01  Q         .         .         .        V.
   22.167    118.8289      0.01  Q         .         .         .        V.
   22.250    118.8290      0.01  Q         .         .         .        V.
   22.333    118.8290      0.01  Q         .         .         .        V.
   22.417    118.8291      0.01  Q         .         .         .        V.
   22.500    118.8292      0.01  Q         .         .         .        V.
   22.583    118.8293      0.01  Q         .         .         .        V.
   22.667    118.8294      0.01  Q         .         .         .        V.
   22.750    118.8294      0.01  Q         .         .         .        V.
   22.833    118.8295      0.01  Q         .         .         .        V.
   22.917    118.8295      0.01  Q         .         .         .        V.
   23.000    118.8296      0.01  Q         .         .         .        V.
   23.083    118.8297      0.01  Q         .         .         .        V.
   23.167    118.8297      0.01  Q         .         .         .        V.
-----------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                             1390.0
```

10%	330.0
20%	220.0
30%	170.0
40%	130.0
50%	95.0
60%	65.0
70%	45.0
80%	30.0
90%	15.0

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****************************************************************************
  FLOW PROCESS FROM NODE    992.00 TO NODE    991.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
============================================================================
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MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 87.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 2379.00
DOWNSTREAM ELEVATION(FT) = 2375.00
PIPE DIAMETER(FT) = 6.00

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	0.50	0.50	0.21	0.000
0.167	2.14	0.79	1.64	0.000
0.250	22.91	8.43	22.91	0.000
0.333	35.42	13.03	35.42	0.000
0.417	39.40	14.49	39.40	0.000
0.500	50.13	17.07	50.07	0.000
0.583	61.97	17.99	61.82	0.000
0.667	68.93	18.53	68.85	0.000
0.750	77.34	19.19	77.24	0.000
0.833	85.70	19.84	85.61	0.000
0.917	91.01	20.25	90.96	0.000
1.000	95.67	20.53	95.63	0.000
1.083	103.96	21.03	103.88	0.000
1.167	117.02	21.81	116.90	0.000
1.250	130.63	22.63	130.52	0.000
1.333	141.15	23.19	141.06	0.000
1.417	149.92	23.60	149.85	0.000
1.500	162.99	24.20	162.88	0.000
1.583	178.39	24.90	178.26	0.000
1.667	190.44	25.38	190.35	0.000
1.750	203.23	25.85	203.12	0.000
1.833	221.97	26.54	221.83	0.000
1.917	239.71	27.15	239.58	0.000
2.000	251.82	27.56	251.73	0.000
2.083	264.75	28.00	264.65	0.000

2.167	288.58	28.63	288.40	0.000
2.250	328.29	29.54	327.99	0.000
2.333	370.03	30.47	369.74	0.000
2.417	403.71	31.07	403.47	0.000
2.500	458.20	32.19	457.84	0.000
2.583	532.29	33.39	531.79	0.000
2.667	599.83	34.18	599.36	0.000
2.750	622.81	34.51	622.66	0.000
2.833	588.80	34.03	589.01	0.000
2.917	540.27	33.50	540.61	0.000
3.000	507.33	33.03	507.55	0.000
3.083	478.09	32.54	478.28	0.000
3.167	448.53	32.00	448.73	0.000
3.250	423.31	31.47	423.48	0.000
3.333	403.65	31.07	403.79	0.000
3.417	387.13	30.77	387.25	0.000
3.500	371.22	30.49	371.34	0.000
3.583	356.03	30.18	356.14	0.000
3.667	341.57	29.85	341.68	0.000
3.750	326.99	29.51	327.09	0.000
3.833	310.98	29.14	311.10	0.000
3.917	292.78	28.73	292.92	0.000
4.000	274.73	28.32	274.87	0.000
4.083	257.54	27.76	257.67	0.000
4.167	240.97	27.20	241.09	0.000
4.250	225.12	26.65	225.24	0.000
4.333	210.06	26.10	210.17	0.000
4.417	195.60	25.57	195.71	0.000
4.500	180.35	24.99	180.48	0.000
4.583	163.45	24.22	163.59	0.000
4.667	147.16	23.47	147.30	0.000
4.750	135.01	22.89	135.12	0.000
4.833	127.31	22.43	127.38	0.000
4.917	121.62	22.09	121.67	0.000
5.000	116.53	21.78	116.58	0.000
5.083	111.66	21.49	111.71	0.000
5.167	106.92	21.20	106.97	0.000
5.250	102.30	20.93	102.34	0.000
5.333	97.80	20.65	97.84	0.000
5.417	93.44	20.39	93.48	0.000
5.500	89.16	20.11	89.21	0.000
5.583	85.16	19.80	85.20	0.000
5.667	81.34	19.50	81.38	0.000
5.750	77.68	19.21	77.72	0.000
5.833	74.19	18.94	74.22	0.000
5.917	70.85	18.68	70.88	0.000
6.000	67.66	18.43	67.70	0.000
6.083	64.62	18.20	64.65	0.000
6.167	61.68	17.97	61.71	0.000
6.250	58.85	17.75	58.89	0.000
6.333	56.21	17.54	56.24	0.000
6.417	53.68	17.35	53.71	0.000
6.500	51.27	17.16	51.30	0.000
6.583	48.96	16.98	48.99	0.000
6.667	46.76	16.81	46.79	0.000
6.750	44.66	16.43	44.68	0.000
6.833	42.65	15.69	42.65	0.000
6.917	40.73	14.98	40.73	0.000
7.000	38.90	14.31	38.90	0.000
7.083	37.15	13.67	37.15	0.000
7.167	35.48	13.05	35.48	0.000
7.250	33.89	12.46	33.89	0.000
7.333	32.36	11.90	32.36	0.000

7.417	30.71	11.29	30.71	0.000
7.500	29.02	10.67	29.02	0.000
7.583	27.70	10.19	27.70	0.000
7.667	26.45	9.73	26.45	0.000
7.750	25.25	9.29	25.25	0.000
7.833	24.10	8.87	24.10	0.000
7.917	23.01	8.46	23.01	0.000
8.000	21.97	8.08	21.97	0.000
8.083	20.98	7.72	20.98	0.000
8.167	20.02	7.37	20.02	0.000
8.250	19.12	7.03	19.12	0.000
8.333	18.25	6.71	18.25	0.000
8.417	17.42	6.41	17.42	0.000
8.500	16.64	6.12	16.64	0.000
8.583	15.88	5.84	15.88	0.000
8.667	15.16	5.58	15.16	0.000
8.750	14.48	5.32	14.48	0.000
8.833	14.00	5.15	14.00	0.000
8.917	13.64	5.02	13.64	0.000
9.000	12.57	4.62	12.57	0.000
9.083	12.00	4.41	12.00	0.000
9.167	11.45	4.21	11.45	0.000
9.250	10.94	4.02	10.94	0.000
9.333	10.44	3.84	10.44	0.000
9.417	9.97	3.67	9.97	0.000
9.500	9.52	3.50	9.52	0.000
9.583	9.08	3.34	9.08	0.000
9.667	8.67	3.19	8.67	0.000
9.750	8.28	3.05	8.28	0.000
9.833	7.91	2.91	7.91	0.000
9.917	7.55	2.78	7.55	0.000
10.000	7.21	2.65	7.21	0.000
10.083	6.88	2.53	6.88	0.000
10.167	6.78	2.49	6.78	0.000
10.250	6.68	2.46	6.68	0.000
10.333	5.96	2.19	5.96	0.000
10.417	5.69	2.09	5.69	0.000
10.500	5.43	2.00	5.43	0.000
10.583	5.18	1.91	5.18	0.000
10.667	4.95	1.82	4.95	0.000
10.750	4.72	1.74	4.72	0.000
10.833	4.51	1.66	4.51	0.000
10.917	4.31	1.58	4.31	0.000
11.000	4.49	1.65	4.49	0.000
11.083	4.17	1.53	4.17	0.000
11.167	3.72	1.37	3.72	0.000
11.250	3.55	1.31	3.55	0.000
11.333	3.39	1.25	3.39	0.000
11.417	3.24	1.19	3.24	0.000
11.500	3.09	1.14	3.09	0.000
11.583	3.19	1.17	3.19	0.000
11.667	3.20	1.18	3.20	0.000
11.750	2.66	0.98	2.66	0.000
11.833	2.54	0.93	2.54	0.000
11.917	2.42	0.89	2.42	0.000
12.000	2.31	0.85	2.31	0.000
12.083	2.57	0.95	2.57	0.000
12.167	2.37	0.87	2.37	0.000
12.250	1.99	0.73	1.99	0.000
12.333	1.90	0.70	1.90	0.000
12.417	1.81	0.67	1.81	0.000
12.500	2.13	0.78	2.13	0.000
12.583	1.86	0.68	1.86	0.000

12.667	1.55	0.57	1.55	0.000
12.750	1.48	0.54	1.48	0.000
12.833	1.61	0.59	1.61	0.000
12.917	1.77	0.65	1.77	0.000
13.000	1.26	0.50	1.32	0.000
13.083	1.20	0.50	1.23	0.000
13.167	1.42	0.52	1.33	0.000
13.250	1.44	0.53	1.44	0.000
13.333	1.02	0.50	1.22	0.000
13.417	0.97	0.50	1.00	0.000
13.500	1.49	0.55	1.26	0.000
13.583	0.93	0.50	1.18	0.000
13.667	0.82	0.50	0.88	0.000
13.750	1.17	0.50	0.97	0.000
13.833	0.97	0.50	1.09	0.000
13.917	1.30	0.50	1.11	0.000
14.000	1.26	0.50	1.28	0.000
14.083	1.20	0.50	1.23	0.000
14.167	1.15	0.50	1.18	0.000
14.250	1.09	0.50	1.12	0.000
14.333	1.05	0.50	1.07	0.000
14.417	1.00	0.50	1.03	0.000
14.500	0.95	0.50	0.98	0.000
14.583	0.91	0.50	0.93	0.000
14.667	0.87	0.50	0.89	0.000
14.750	0.83	0.50	0.85	0.000
14.833	0.79	0.50	0.81	0.000
14.917	0.76	0.50	0.78	0.000
15.000	0.72	0.50	0.74	0.000
15.083	0.69	0.50	0.71	0.000
15.167	0.66	0.50	0.68	0.000
15.250	0.63	0.50	0.64	0.000
15.333	0.60	0.50	0.62	0.000
15.417	0.57	0.50	0.59	0.000
15.500	0.55	0.50	0.56	0.000
15.583	0.52	0.50	0.54	0.000
15.667	0.50	0.50	0.51	0.000
15.750	0.48	0.50	0.49	0.000
15.833	0.45	0.50	0.47	0.000
15.917	0.43	0.50	0.45	0.000
16.000	0.41	0.50	0.42	0.000
16.083	0.39	0.50	0.41	0.000
16.167	0.38	0.50	0.39	0.000
16.250	0.36	0.50	0.37	0.000
16.333	0.34	0.50	0.35	0.000
16.417	0.33	0.50	0.34	0.000
16.500	0.31	0.50	0.32	0.000
16.583	0.30	0.50	0.31	0.000
16.667	0.29	0.50	0.29	0.000
16.750	0.27	0.50	0.28	0.000
16.833	0.26	0.50	0.27	0.000
16.917	0.25	0.50	0.26	0.000
17.000	0.24	0.50	0.24	0.000
17.083	0.23	0.50	0.23	0.000
17.167	0.22	0.50	0.22	0.000
17.250	0.21	0.50	0.21	0.000
17.333	0.20	0.50	0.20	0.000
17.417	0.19	0.50	0.19	0.000
17.500	0.18	0.50	0.18	0.000
17.583	0.17	0.50	0.18	0.000
17.667	0.16	0.50	0.17	0.000
17.750	0.16	0.50	0.16	0.000
17.833	0.15	0.50	0.15	0.000

17.917	0.14	0.50	0.15	0.000
18.000	0.14	0.50	0.14	0.000
18.083	0.13	0.50	0.13	0.000
18.167	0.12	0.50	0.13	0.000
18.250	0.12	0.50	0.12	0.000
18.333	0.11	0.50	0.12	0.000
18.417	0.11	0.50	0.11	0.000
18.500	0.10	0.50	0.11	0.000
18.583	0.10	0.50	0.10	0.000
18.667	0.09	0.50	0.10	0.000
18.750	0.09	0.50	0.09	0.000
18.833	0.09	0.50	0.09	0.000
18.917	0.08	0.50	0.08	0.000
19.000	0.08	0.50	0.08	0.000
19.083	0.07	0.50	0.08	0.000
19.167	0.07	0.50	0.07	0.000
19.250	0.07	0.50	0.07	0.000
19.333	0.06	0.50	0.07	0.000
19.417	0.06	0.50	0.06	0.000
19.500	0.06	0.50	0.06	0.000
19.583	0.06	0.50	0.06	0.000
19.667	0.05	0.50	0.06	0.000
19.750	0.05	0.50	0.05	0.000
19.833	0.05	0.50	0.05	0.000
19.917	0.05	0.50	0.05	0.000
20.000	0.04	0.50	0.05	0.000
20.083	0.04	0.50	0.04	0.000
20.167	0.04	0.50	0.04	0.000
20.250	0.04	0.50	0.04	0.000
20.333	0.04	0.50	0.04	0.000
20.417	0.04	0.50	0.04	0.000
20.500	0.03	0.50	0.03	0.000
20.583	0.03	0.50	0.03	0.000
20.667	0.03	0.50	0.03	0.000
20.750	0.03	0.50	0.03	0.000
20.833	0.03	0.50	0.03	0.000
20.917	0.03	0.50	0.03	0.000
21.000	0.03	0.50	0.03	0.000
21.083	0.02	0.50	0.03	0.000
21.167	0.02	0.50	0.02	0.000
21.250	0.02	0.50	0.02	0.000
21.333	0.02	0.50	0.02	0.000
21.417	0.02	0.50	0.02	0.000
21.500	0.02	0.50	0.02	0.000
21.583	0.02	0.50	0.02	0.000
21.667	0.02	0.50	0.02	0.000
21.750	0.02	0.50	0.02	0.000
21.833	0.02	0.50	0.02	0.000
21.917	0.02	0.50	0.02	0.000
22.000	0.01	0.50	0.02	0.000
22.083	0.01	0.50	0.01	0.000
22.167	0.01	0.50	0.01	0.000
22.250	0.01	0.50	0.01	0.000
22.333	0.01	0.50	0.01	0.000
22.417	0.01	0.50	0.01	0.000
22.500	0.01	0.50	0.01	0.000
22.583	0.01	0.50	0.01	0.000
22.667	0.01	0.50	0.01	0.000
22.750	0.01	0.50	0.01	0.000
22.833	0.01	0.50	0.01	0.000
22.917	0.01	0.50	0.01	0.000
23.000	0.01	0.50	0.01	0.000
23.083	0.01	0.50	0.01	0.000

23.167	0.01	0.50	0.01	0.000
23.250	0.01	0.50	0.01	0.000
23.333	0.01	0.50	0.01	0.000
23.417	0.01	0.50	0.01	0.000
23.500	0.01	0.50	0.01	0.000
23.583	0.01	0.50	0.01	0.000
23.667	0.01	0.50	0.01	0.000
23.750	0.01	0.50	0.01	0.000
23.833	0.01	0.50	0.01	0.000
23.917	0.01	0.50	0.01	0.000
24.000	0.00	0.50	0.00	0.000

****
FLOW PROCESS FROM NODE 991.00 TO NODE 991.00 IS CODE = 1

>>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 26.500 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
*USER ENTERED "LAG" TIME = 0.100 HOURS
CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
VALLEY S-GRAPH SELECTED
UNIFORM MEAN SOIL-LOSS(INCH/HOUR) = 0.088
LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.500
USER-ENTERED RAINFALL = 2.25 INCHES
RCFC&WCD 3-Hour Storm (5-Minute period) SELECTED
RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 83.333

==
UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	13.994	44.848
2	59.664	146.366
3	78.792	61.303
4	86.766	25.554
5	91.428	14.941
6	94.514	9.891
7	96.650	6.844
8	98.044	4.469
9	98.699	2.097
10	99.289	1.892
11	99.716	1.367
12	99.929	0.684
13	100.000	0.228

****

UNIT PERIOD (NUMBER)	UNIT RAINFALL (INCHES)	UNIT SOIL-LOSS (INCHES)	EFFECTIVE RAINFALL (INCHES)
1	0.0292	0.0073	0.0219
2	0.0292	0.0073	0.0219
3	0.0247	0.0073	0.0174
4	0.0337	0.0073	0.0264
5	0.0337	0.0073	0.0264
6	0.0405	0.0073	0.0332
7	0.0337	0.0073	0.0264
8	0.0405	0.0073	0.0332
9	0.0405	0.0073	0.0332
10	0.0337	0.0073	0.0264
11	0.0360	0.0073	0.0287
12	0.0405	0.0073	0.0332
13	0.0495	0.0073	0.0422
14	0.0495	0.0073	0.0422
15	0.0495	0.0073	0.0422
16	0.0450	0.0073	0.0377
17	0.0585	0.0073	0.0512
18	0.0607	0.0073	0.0534
19	0.0540	0.0073	0.0467
20	0.0607	0.0073	0.0534
21	0.0742	0.0073	0.0669
22	0.0697	0.0073	0.0624
23	0.0652	0.0073	0.0579
24	0.0675	0.0073	0.0602
25	0.0697	0.0073	0.0624
26	0.0945	0.0073	0.0871
27	0.1125	0.0073	0.1051
28	0.0787	0.0073	0.0714
29	0.1530	0.0073	0.1456
30	0.1642	0.0073	0.1569
31	0.1845	0.0073	0.1771
32	0.1327	0.0073	0.1254
33	0.0450	0.0073	0.0377
34	0.0405	0.0073	0.0332
35	0.0405	0.0073	0.0332
36	0.0135	0.0067	0.0067

TOTAL STORM RAINFALL(INCHES) = 2.25
TOTAL SOIL-LOSS(INCHES) = 0.26
TOTAL EFFECTIVE RAINFALL(INCHES) = 1.99

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 0.5824
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 4.3836

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==============================================================================

                        3 - H O U R   S T O R M
                   R U N O F F   H Y D R O G R A P H

==============================================================================
             HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
      (Note: Time indicated is at END of Each Unit Intervals)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        12.5      25.0      37.5      50.0
------------------------------------------------------------------------------
   0.083      0.0068      0.98  Q         .         .         .         .
   0.167      0.0356      4.19  V  Q      .         .         .         .
   0.250      0.0723      5.33  V   Q     .         .         .         .
   0.333      0.1111      5.63  .V  Q     .         .         .         .
   0.417      0.1594      7.00  .V   Q    .         .         .         .
   0.500      0.2142      7.96  .V    Q   .         .         .         .
   0.583      0.2759      8.96  . V    Q  .         .         .         .
   0.667      0.3370      8.87  .  V   Q  .         .         .         .
   0.750      0.4039      9.72  .  V   Q  .         .         .         .
   0.833      0.4718      9.85  .   V  Q  .         .         .         .
   0.917      0.5348      9.16  .   V  Q  .         .         .         .
   1.000      0.5994      9.38  .    V Q  .         .         .         .
   1.083      0.6716     10.48  .     V Q .         .         .         .
   1.167      0.7547     12.06  .     V  Q.         .         .         .
   1.250      0.8424     12.73  .      V  Q         .         .         .
   1.333      0.9306     12.82  .       V Q         .         .         .
   1.417      1.0197     12.94  .        VQ         .         .         .
   1.500      1.1220     14.86  .         VQ        .         .         .
   1.583      1.2300     15.67  .         .VQ       .         .         .
   1.667      1.3364     15.45  .         . Q       .         .         .
   1.750      1.4526     16.87  .         .  Q      .         .         .
   1.833      1.5838     19.05  .         .   VQ    .         .         .
   1.917      1.7160     19.19  .         .    Q    .         .         .
   2.000      1.8455     18.81  .         .    QV   .         .         .
   2.083      1.9771     19.11  .         .    Q  V .         .         .
   2.167      2.1195     20.68  .         .     Q  V.         .         .
   2.250      2.2939     25.32  .         .         Q         .         .
   2.333      2.4870     28.04  .         .         . Q       .         .
   2.417      2.6813     28.21  .         .         . Q V     .         .
   2.500      2.9456     38.38  .         .         .     V   Q         .
   2.583      3.2567     45.17  .         .         .        V.      Q  .
   2.667      3.5890     48.25  .         .         .         . V      Q .
   2.750      3.8596     39.28  .         .         .         .Q   V    .
   2.833      4.0276     24.39  .         .        Q.         .     V   .
   2.917      4.1508     17.89  .         .   Q     .         .      V  .
   3.000      4.2474     14.02  .         .Q        .         .       V .
   3.083      4.3041      8.24  .     Q   .         .         .        V.
   3.167      4.3356      4.57  .  Q      .         .         .        V.
   3.250      4.3546      2.75  . Q       .         .         .        V.
   3.333      4.3666      1.75  .Q        .         .         .        V.
   3.417      4.3745      1.14  Q         .         .         .        V.
   3.500      4.3791      0.66  Q         .         .         .        V.
   3.583      4.3814      0.34  Q         .         .         .        V.
   3.667      4.3826      0.18  Q         .         .         .        V.
   3.750      4.3832      0.09  Q         .         .         .        V.
   3.833      4.3835      0.04  Q         .         .         .        V.
   3.917      4.3836      0.01  Q         .         .         .        V.
   4.000      4.3836      0.00  Q         .         .         .         V
-------------------------------------------------------------------------------
---
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
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```
   an instantaneous time duration)

   Percentile of Estimated                 Duration
       Peak Flow Rate                      (minutes)
   =======================                 =========
              0%                             240.0
             10%                             175.0
             20%                             130.0
             30%                              90.0
             40%                              45.0
             50%                              40.0
             60%                              20.0
             70%                              20.0
             80%                              15.0
             90%                              10.0


****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE    991.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0082      1.19  Q         .         .         .         .
   0.167      0.0484      5.83  Q         .         .         .         .
   0.250      0.2428     28.24  VQ        .         .         .         .
   0.333      0.5255     41.05  V Q       .         .         .         .
   0.417      0.8451     46.40  V Q       .         .         .         .
   0.500      1.2448     58.03  V  Q      .         .         .         .
   0.583      1.7322     70.78  V   Q     .         .         .         .
   0.667      2.2675     77.72  V   Q     .         .         .         .
   0.750      2.8665     86.97  V   Q     .         .         .         .
   0.833      3.5239     95.46  .V   Q    .         .         .         .
   0.917      4.2134    100.12  .V   Q    .         .         .         .
   1.000      4.9366    105.01  .V    Q   .         .         .         .
   1.083      5.7242    114.35  .V    Q   .         .         .         .
   1.167      6.6124    128.97  . V    Q  .         .         .         .
   1.250      7.5989    143.25  . V     Q .         .         .         .
   1.333      8.6587    153.88  . V     Q .         .         .         .
   1.417      9.7798    162.78  .  V     Q.         .         .         .
   1.500     11.0039    177.74  .  V      Q         .         .         .
   1.583     12.3395    193.94  .   V     .Q        .         .         .
   1.667     13.7568    205.80  .   V     .Q        .         .         .
   1.750     15.2720    220.00  .   V     . Q       .         .         .
   1.833     16.9309    240.87  .    V    .  Q      .         .         .
   1.917     18.7130    258.77  .     V   .   Q     .         .         .
   2.000     20.5763    270.54  .     V   .    Q    .         .         .
   2.083     22.5305    283.76  .      V  .     Q   .         .         .
   2.167     24.6592    309.08  .       V .      Q  .         .         .
   2.250     27.0924    353.31  .       V .         Q         .         .
   2.333     29.8320    397.78  .        V.         . Q       .         .
   2.417     32.8050    431.68  .         V         .   Q     .         .
   2.500     36.2225    496.22  .         .V        .       Q .         .
   2.583     40.1960    576.96  .         .  V      .         . Q       .
   2.667     44.6561    647.61  .         .   V     .         .      Q  .
   2.750     49.2150    661.95  .         .    V    .         .      Q  .
   2.833     53.4396    613.41  .         .      V  .         .    Q    .
   2.917     57.2860    558.50  .         .       V .         .Q        .
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   3.000     60.8781    521.57  .         .        V.        Q.         .
   3.083     64.2288    486.52  .         .         V      Q  .         .
   3.167     67.3507    453.30  .         .         .V   Q    .         .
   3.250     70.2862    426.23  .         .         . V Q     .         .
   3.333     73.0792    405.54  .         .         .  Q      .         .
   3.417     75.7540    388.39  .         .         . Q V     .         .
   3.500     78.3160    372.00  .         .         .Q   V    .         .
   3.583     80.7711    356.48  .         .         Q     V   .         .
   3.667     83.1255    341.85  .         .        Q.     V   .         .
   3.750     85.3788    327.18  .         .       Q .      V  .         .
   3.833     87.5216    311.14  .         .      Q  .       V .         .
   3.917     89.5391    292.93  .         .     Q   .        V.         .
   4.000     91.4321    274.87  .         .    Q    .        V.         .
   4.083     93.2067    257.67  .         .   Q     .         V         .
   4.167     94.8671    241.09  .         .  Q      .         V         .
   4.250     96.4183    225.24  .         . Q       .         .V        .
   4.333     97.8658    210.17  .         . Q       .         .V        .
   4.417     99.2137    195.71  .         .Q        .         . V       .
   4.500    100.4566    180.48  .         Q         .         . V       .
   4.583    101.5833    163.59  .        Q.         .         . V       .
   4.667    102.5977    147.30  .       Q .         .         .  V      .
   4.750    103.5283    135.12  .      Q  .         .         .  V      .
   4.833    104.4056    127.38  .      Q  .         .         .  V      .
   4.917    105.2435    121.67  .     Q   .         .         .   V     .
   5.000    106.0464    116.58  .     Q   .         .         .   V     .
   5.083    106.8157    111.71  .     Q   .         .         .   V     .
   5.167    107.5524    106.97  .     Q   .         .         .   V     .
   5.250    108.2573    102.34  .    Q    .         .         .    V    .
   5.333    108.9311     97.84  .    Q    .         .         .    V    .
   5.417    109.5749     93.48  .    Q    .         .         .    V    .
   5.500    110.1893     89.21  .    Q    .         .         .    V    .
   5.583    110.7761     85.20  .   Q     .         .         .    V    .
   5.667    111.3365     81.38  .   Q     .         .         .     V   .
   5.750    111.8718     77.72  .   Q     .         .         .     V   .
   5.833    112.3829     74.22  .   Q     .         .         .     V   .
   5.917    112.8711     70.88  .   Q     .         .         .     V   .
   6.000    113.3373     67.70  .  Q      .         .         .     V   .
   6.083    113.7826     64.65  .  Q      .         .         .     V   .
   6.167    114.2076     61.71  .  Q      .         .         .      V  .
   6.250    114.6132     58.89  .  Q      .         .         .      V  .
   6.333    115.0005     56.24  .  Q      .         .         .      V  .
   6.417    115.3704     53.71  .  Q      .         .         .      V  .
   6.500    115.7237     51.30  . Q       .         .         .      V  .
   6.583    116.0611     48.99  . Q       .         .         .      V  .
   6.667    116.3834     46.79  . Q       .         .         .      V  .
   6.750    116.6911     44.68  . Q       .         .         .      V  .
   6.833    116.9848     42.65  . Q       .         .         .      V  .
   6.917    117.2654     40.73  . Q       .         .         .       V .
   7.000    117.5333     38.90  . Q       .         .         .       V .
   7.083    117.7892     37.15  . Q       .         .         .       V .
   7.167    118.0335     35.48  . Q       .         .         .       V .
   7.250    118.2669     33.89  .Q        .         .         .       V .
   7.333    118.4898     32.36  .Q        .         .         .       V .
   7.417    118.7013     30.71  .Q        .         .         .       V .
   7.500    118.9011     29.02  .Q        .         .         .       V .
   7.583    119.0919     27.70  .Q        .         .         .       V .
   7.667    119.2741     26.45  .Q        .         .         .       V .
   7.750    119.4480     25.25  .Q        .         .         .       V .
   7.833    119.6140     24.10  .Q        .         .         .       V .
   7.917    119.7725     23.01  .Q        .         .         .       V .
   8.000    119.9238     21.97  .Q        .         .         .       V .
   8.083    120.0682     20.98  .Q        .         .         .       V .
   8.167    120.2061     20.02  .Q        .         .         .        V.
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8.250	120.3378	19.12	.Q	.	.	.	V.
8.333	120.4635	18.25	.Q	.	.	.	V.
8.417	120.5835	17.42	Q	.	.	.	V.
8.500	120.6981	16.64	Q	.	.	.	V.
8.583	120.8075	15.88	Q	.	.	.	V.
8.667	120.9119	15.16	Q	.	.	.	V.
8.750	121.0116	14.48	Q	.	.	.	V.
8.833	121.1080	14.00	Q	.	.	.	V.
8.917	121.2019	13.64	Q	.	.	.	V.
9.000	121.2885	12.57	Q	.	.	.	V.
9.083	121.3711	12.00	Q	.	.	.	V.
9.167	121.4500	11.45	Q	.	.	.	V.
9.250	121.5253	10.94	Q	.	.	.	V.
9.333	121.5972	10.44	Q	.	.	.	V.
9.417	121.6659	9.97	Q	.	.	.	V.
9.500	121.7314	9.52	Q	.	.	.	V.
9.583	121.7940	9.08	Q	.	.	.	V.
9.667	121.8537	8.67	Q	.	.	.	V.
9.750	121.9108	8.28	Q	.	.	.	V.
9.833	121.9652	7.91	Q	.	.	.	V.
9.917	122.0172	7.55	Q	.	.	.	V.
10.000	122.0668	7.21	Q	.	.	.	V.
10.083	122.1142	6.88	Q	.	.	.	V.
10.167	122.1609	6.78	Q	.	.	.	V.
10.250	122.2069	6.68	Q	.	.	.	V.
10.333	122.2479	5.96	Q	.	.	.	V.
10.417	122.2871	5.69	Q	.	.	.	V.
10.500	122.3245	5.43	Q	.	.	.	V.
10.583	122.3602	5.18	Q	.	.	.	V.
10.667	122.3942	4.95	Q	.	.	.	V.
10.750	122.4268	4.72	Q	.	.	.	V.
10.833	122.4579	4.51	Q	.	.	.	V.
10.917	122.4875	4.31	Q	.	.	.	V.
11.000	122.5184	4.49	Q	.	.	.	V.
11.083	122.5471	4.17	Q	.	.	.	V.
11.167	122.5727	3.72	Q	.	.	.	V.
11.250	122.5972	3.55	Q	.	.	.	V.
11.333	122.6205	3.39	Q	.	.	.	V.
11.417	122.6428	3.24	Q	.	.	.	V.
11.500	122.6641	3.09	Q	.	.	.	V.
11.583	122.6861	3.19	Q	.	.	.	V.
11.667	122.7081	3.20	Q	.	.	.	V.
11.750	122.7264	2.66	Q	.	.	.	V.
11.833	122.7439	2.54	Q	.	.	.	V.
11.917	122.7606	2.42	Q	.	.	.	V.
12.000	122.7766	2.31	Q	.	.	.	V.
12.083	122.7943	2.57	Q	.	.	.	V.
12.167	122.8106	2.37	Q	.	.	.	V.
12.250	122.8242	1.99	Q	.	.	.	V.
12.333	122.8373	1.90	Q	.	.	.	V.
12.417	122.8498	1.81	Q	.	.	.	V.
12.500	122.8645	2.13	Q	.	.	.	V.
12.583	122.8773	1.86	Q	.	.	.	V.
12.667	122.8879	1.55	Q	.	.	.	V.
12.750	122.8981	1.48	Q	.	.	.	V.
12.833	122.9092	1.61	Q	.	.	.	V.
12.917	122.9214	1.77	Q	.	.	.	V.
13.000	122.9305	1.32	Q	.	.	.	V.
13.083	122.9390	1.23	Q	.	.	.	V.
13.167	122.9481	1.33	Q	.	.	.	V.
13.250	122.9580	1.44	Q	.	.	.	V.
13.333	122.9664	1.22	Q	.	.	.	V.
13.417	122.9733	1.00	Q	.	.	.	V.

13.500	122.9820	1.26	Q	.	.	.	V.
13.583	122.9901	1.18	Q	.	.	.	V.
13.667	122.9962	0.88	Q	.	.	.	V.
13.750	123.0028	0.97	Q	.	.	.	V.
13.833	123.0103	1.09	Q	.	.	.	V.
13.917	123.0179	1.11	Q	.	.	.	V.
14.000	123.0268	1.28	Q	.	.	.	V.
14.083	123.0353	1.23	Q	.	.	.	V.
14.167	123.0434	1.18	Q	.	.	.	V.
14.250	123.0511	1.12	Q	.	.	.	V.
14.333	123.0585	1.07	Q	.	.	.	V.
14.417	123.0656	1.03	Q	.	.	.	V.
14.500	123.0723	0.98	Q	.	.	.	V.
14.583	123.0788	0.93	Q	.	.	.	V.
14.667	123.0849	0.89	Q	.	.	.	V.
14.750	123.0908	0.85	Q	.	.	.	V.
14.833	123.0964	0.81	Q	.	.	.	V.
14.917	123.1017	0.78	Q	.	.	.	V.
15.000	123.1068	0.74	Q	.	.	.	V.
15.083	123.1117	0.71	Q	.	.	.	V.
15.167	123.1164	0.68	Q	.	.	.	V.
15.250	123.1208	0.64	Q	.	.	.	V.
15.333	123.1250	0.62	Q	.	.	.	V.
15.417	123.1291	0.59	Q	.	.	.	V.
15.500	123.1330	0.56	Q	.	.	.	V.
15.583	123.1367	0.54	Q	.	.	.	V.
15.667	123.1402	0.51	Q	.	.	.	V.
15.750	123.1435	0.49	Q	.	.	.	V.
15.833	123.1468	0.47	Q	.	.	.	V.
15.917	123.1498	0.45	Q	.	.	.	V.
16.000	123.1527	0.42	Q	.	.	.	V.
16.083	123.1555	0.41	Q	.	.	.	V.
16.167	123.1582	0.39	Q	.	.	.	V.
16.250	123.1608	0.37	Q	.	.	.	V.
16.333	123.1632	0.35	Q	.	.	.	V.
16.417	123.1655	0.34	Q	.	.	.	V.
16.500	123.1677	0.32	Q	.	.	.	V.
16.583	123.1698	0.31	Q	.	.	.	V.
16.667	123.1719	0.29	Q	.	.	.	V.
16.750	123.1738	0.28	Q	.	.	.	V.
16.833	123.1756	0.27	Q	.	.	.	V.
16.917	123.1774	0.26	Q	.	.	.	V.
17.000	123.1791	0.24	Q	.	.	.	V.
17.083	123.1807	0.23	Q	.	.	.	V.
17.167	123.1822	0.22	Q	.	.	.	V.
17.250	123.1836	0.21	Q	.	.	.	V.
17.333	123.1850	0.20	Q	.	.	.	V.
17.417	123.1864	0.19	Q	.	.	.	V.
17.500	123.1876	0.18	Q	.	.	.	V.
17.583	123.1889	0.18	Q	.	.	.	V.
17.667	123.1900	0.17	Q	.	.	.	V.
17.750	123.1911	0.16	Q	.	.	.	V.
17.833	123.1922	0.15	Q	.	.	.	V.
17.917	123.1932	0.15	Q	.	.	.	V.
18.000	123.1941	0.14	Q	.	.	.	V.
18.083	123.1951	0.13	Q	.	.	.	V.
18.167	123.1959	0.13	Q	.	.	.	V.
18.250	123.1968	0.12	Q	.	.	.	V.
18.333	123.1976	0.12	Q	.	.	.	V.
18.417	123.1983	0.11	Q	.	.	.	V.
18.500	123.1991	0.11	Q	.	.	.	V.
18.583	123.1998	0.10	Q	.	.	.	V.
18.667	123.2004	0.10	Q	.	.	.	V.

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   18.750    123.2010      0.09  Q          .         .         .        V.
   18.833    123.2017      0.09  Q          .         .         .        V.
   18.917    123.2022      0.08  Q          .         .         .        V.
   19.000    123.2028      0.08  Q          .         .         .        V.
   19.083    123.2033      0.08  Q          .         .         .        V.
   19.167    123.2038      0.07  Q          .         .         .        V.
   19.250    123.2043      0.07  Q          .         .         .        V.
   19.333    123.2048      0.07  Q          .         .         .        V.
   19.417    123.2052      0.06  Q          .         .         .        V.
   19.500    123.2056      0.06  Q          .         .         .        V.
   19.583    123.2060      0.06  Q          .         .         .        V.
   19.667    123.2064      0.06  Q          .         .         .        V.
   19.750    123.2067      0.05  Q          .         .         .        V.
   19.833    123.2071      0.05  Q          .         .         .        V.
   19.917    123.2074      0.05  Q          .         .         .        V.
   20.000    123.2077      0.05  Q          .         .         .        V.
   20.083    123.2080      0.04  Q          .         .         .        V.
   20.167    123.2083      0.04  Q          .         .         .        V.
   20.250    123.2086      0.04  Q          .         .         .        V.
   20.333    123.2089      0.04  Q          .         .         .        V.
   20.417    123.2091      0.04  Q          .         .         .        V.
   20.500    123.2094      0.03  Q          .         .         .        V.
   20.583    123.2096      0.03  Q          .         .         .        V.
   20.667    123.2098      0.03  Q          .         .         .        V.
   20.750    123.2100      0.03  Q          .         .         .        V.
   20.833    123.2102      0.03  Q          .         .         .        V.
   20.917    123.2104      0.03  Q          .         .         .        V.
   21.000    123.2106      0.03  Q          .         .         .        V.
   21.083    123.2108      0.03  Q          .         .         .        V.
   21.167    123.2109      0.02  Q          .         .         .        V.
   21.250    123.2111      0.02  Q          .         .         .        V.
   21.333    123.2112      0.02  Q          .         .         .        V.
   21.417    123.2114      0.02  Q          .         .         .        V.
   21.500    123.2115      0.02  Q          .         .         .        V.
   21.583    123.2116      0.02  Q          .         .         .        V.
   21.667    123.2118      0.02  Q          .         .         .        V.
   21.750    123.2119      0.02  Q          .         .         .        V.
   21.833    123.2120      0.02  Q          .         .         .        V.
   21.917    123.2121      0.02  Q          .         .         .        V.
   22.000    123.2122      0.02  Q          .         .         .        V.
   22.083    123.2123      0.01  Q          .         .         .        V.
   22.167    123.2124      0.01  Q          .         .         .        V.
   22.250    123.2125      0.01  Q          .         .         .        V.
   22.333    123.2126      0.01  Q          .         .         .        V.
   22.417    123.2127      0.01  Q          .         .         .        V.
   22.500    123.2127      0.01  Q          .         .         .        V.
   22.583    123.2128      0.01  Q          .         .         .        V.
   22.667    123.2129      0.01  Q          .         .         .        V.
   22.750    123.2130      0.01  Q          .         .         .        V.
   22.833    123.2130      0.01  Q          .         .         .        V.
   22.917    123.2131      0.01  Q          .         .         .        V.
   23.000    123.2132      0.01  Q          .         .         .        V.
   23.083    123.2132      0.01  Q          .         .         .        V.
   23.167    123.2133      0.01  Q          .         .         .        V.
------------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
```

0%	1390.0
10%	330.0
20%	215.0
30%	165.0
40%	125.0
50%	90.0
60%	65.0
70%	40.0
80%	25.0
90%	15.0

```
****************************************************************************
  FLOW PROCESS FROM NODE    991.00 TO NODE     99.00 IS CODE =   4
----------------------------------------------------------------------------
  >>>>>MODEL PIPEFLOW ROUTING OF STREAM #1<<<<<
============================================================================
```

MODEL PIPEFLOW ROUTING OF STREAM 1 WHERE
STORAGE EFFECTS ARE NEGLECTED WITHIN THE PIPE, FLOW
VELOCITIES ARE ESTIMATED BY ASSUMING STEADY FLOW FOR
EACH UNIT INTERVAL(NORMAL DEPTH, Dn), AND FLOWS IN EXCESS
OF (.82)(DIAMETER) ARE PONDED AT THE UPSTREAM INLET:
UNIT INTERVAL FLOW VELOCITY COMPUTED USING Dn UP TO
(0.938)(DIAMETER):

PIPELENGTH(FT) = 312.00 MANNINGS FACTOR = 0.013
UPSTREAM ELEVATION(FT) = 2375.00
DOWNSTREAM ELEVATION(FT) = 2366.00
PIPE DIAMETER(FT) = 6.50

NORMAL DEPTH VELOCITY PIPE ROUTING RESULTS:

TIME (HRS)	INFLOW (CFS)	VELOCITY (FPS)	OUTFLOW (CFS)	UPSTREAM PONDING(AF)
0.083	1.19	0.50	0.00	0.000
0.167	5.83	1.83	2.51	0.000
0.250	28.24	8.85	29.33	0.000
0.333	41.05	12.87	41.15	0.000
0.417	46.40	14.08	46.29	0.000
0.500	58.03	14.85	57.39	0.000
0.583	70.78	15.70	70.15	0.000
0.667	77.72	16.16	77.41	0.000
0.750	86.97	16.77	86.58	0.000
0.833	95.46	17.23	95.09	0.000
0.917	100.12	17.47	99.92	0.000
1.000	105.01	17.72	104.81	0.000
1.083	114.35	18.20	113.98	0.000
1.167	128.97	18.95	128.42	0.000
1.250	143.25	19.57	142.71	0.000
1.333	153.88	19.98	153.48	0.000
1.417	162.78	20.33	162.46	0.000
1.500	177.74	20.92	177.23	0.000
1.583	193.94	21.43	193.36	0.000
1.667	205.80	21.80	205.39	0.000
1.750	220.00	22.24	219.53	0.000
1.833	240.87	22.86	240.20	0.000
1.917	258.77	23.37	258.22	0.000
2.000	270.54	23.68	270.17	0.000

2.083	283.76	23.94	283.31	0.000
2.167	309.08	24.42	308.25	0.000
2.250	353.31	25.30	351.95	0.000
2.333	397.78	25.99	396.38	0.000
2.417	431.68	26.59	430.71	0.000
2.500	496.22	27.58	494.40	0.000
2.583	576.96	28.43	574.56	0.000
2.667	647.61	29.20	645.65	0.000
2.750	661.95	29.33	661.54	0.000
2.833	613.41	28.86	614.77	0.000
2.917	558.50	28.26	560.05	0.000
3.000	521.57	27.89	522.68	0.000
3.083	486.52	27.46	487.54	0.000
3.167	453.30	26.96	454.24	0.000
3.250	426.23	26.49	426.99	0.000
3.333	405.54	26.12	406.12	0.000
3.417	388.39	25.84	388.91	0.000
3.500	372.00	25.60	372.52	0.000
3.583	356.48	25.36	356.98	0.000
3.667	341.85	25.07	342.29	0.000
3.750	327.18	24.78	327.63	0.000
3.833	311.14	24.46	311.64	0.000
3.917	292.93	24.11	293.52	0.000
4.000	274.87	23.76	275.47	0.000
4.083	257.67	23.34	258.21	0.000
4.167	241.09	22.86	241.61	0.000
4.250	225.24	22.40	225.75	0.000
4.333	210.17	21.94	210.67	0.000
4.417	195.71	21.48	196.20	0.000
4.500	180.48	21.01	181.01	0.000
4.583	163.59	20.36	164.17	0.000
4.667	147.30	19.73	147.89	0.000
4.750	135.12	19.25	135.59	0.000
4.833	127.38	18.87	127.66	0.000
4.917	121.67	18.58	121.88	0.000
5.000	116.58	18.32	116.77	0.000
5.083	111.71	18.07	111.90	0.000
5.167	106.97	17.82	107.16	0.000
5.250	102.34	17.59	102.53	0.000
5.333	97.84	17.36	98.03	0.000
5.417	93.48	17.13	93.67	0.000
5.500	89.21	16.91	89.39	0.000
5.583	85.20	16.65	85.37	0.000
5.667	81.38	16.40	81.54	0.000
5.750	77.72	16.16	77.88	0.000
5.833	74.22	15.92	74.38	0.000
5.917	70.88	15.70	71.04	0.000
6.000	67.70	15.49	67.85	0.000
6.083	64.65	15.29	64.80	0.000
6.167	61.71	15.09	61.86	0.000
6.250	58.89	14.91	59.03	0.000
6.333	56.24	14.73	56.38	0.000
6.417	53.71	14.56	53.85	0.000
6.500	51.30	14.40	51.43	0.000
6.583	48.99	14.25	49.12	0.000
6.667	46.79	14.10	46.92	0.000
6.750	44.68	13.96	44.80	0.000
6.833	42.65	13.37	42.66	0.000
6.917	40.73	12.77	40.73	0.000
7.000	38.90	12.19	38.90	0.000
7.083	37.15	11.64	37.15	0.000
7.167	35.48	11.12	35.48	0.000
7.250	33.89	10.62	33.89	0.000

7.333	32.36	10.14	32.36	0.000
7.417	30.71	9.62	30.71	0.000
7.500	29.02	9.09	29.02	0.000
7.583	27.70	8.68	27.70	0.000
7.667	26.45	8.29	26.45	0.000
7.750	25.25	7.91	25.25	0.000
7.833	24.10	7.55	24.10	0.000
7.917	23.01	7.21	23.01	0.000
8.000	21.97	6.89	21.97	0.000
8.083	20.98	6.57	20.98	0.000
8.167	20.02	6.28	20.02	0.000
8.250	19.12	5.99	19.12	0.000
8.333	18.25	5.72	18.25	0.000
8.417	17.42	5.46	17.42	0.000
8.500	16.64	5.21	16.64	0.000
8.583	15.88	4.98	15.88	0.000
8.667	15.16	4.75	15.16	0.000
8.750	14.48	4.54	14.48	0.000
8.833	14.00	4.39	14.00	0.000
8.917	13.64	4.27	13.64	0.000
9.000	12.57	3.94	12.57	0.000
9.083	12.00	3.76	12.00	0.000
9.167	11.45	3.59	11.45	0.000
9.250	10.94	3.43	10.94	0.000
9.333	10.44	3.27	10.44	0.000
9.417	9.97	3.12	9.97	0.000
9.500	9.52	2.98	9.52	0.000
9.583	9.08	2.85	9.08	0.000
9.667	8.67	2.72	8.67	0.000
9.750	8.28	2.60	8.28	0.000
9.833	7.91	2.48	7.91	0.000
9.917	7.55	2.37	7.55	0.000
10.000	7.21	2.26	7.21	0.000
10.083	6.88	2.16	6.88	0.000
10.167	6.78	2.12	6.78	0.000
10.250	6.68	2.09	6.68	0.000
10.333	5.96	1.87	5.96	0.000
10.417	5.69	1.78	5.69	0.000
10.500	5.43	1.70	5.43	0.000
10.583	5.18	1.62	5.18	0.000
10.667	4.95	1.55	4.95	0.000
10.750	4.72	1.48	4.72	0.000
10.833	4.51	1.41	4.51	0.000
10.917	4.31	1.35	4.31	0.000
11.000	4.49	1.41	4.49	0.000
11.083	4.17	1.31	4.17	0.000
11.167	3.72	1.17	3.72	0.000
11.250	3.55	1.11	3.55	0.000
11.333	3.39	1.06	3.39	0.000
11.417	3.24	1.01	3.32	0.000
11.500	3.09	0.97	3.15	0.000
11.583	3.19	1.00	2.94	0.000
11.667	3.20	1.00	3.30	0.000
11.750	2.66	0.83	3.20	0.000
11.833	2.54	0.80	2.13	0.000
11.917	2.42	0.76	2.42	0.000
12.000	2.31	0.73	2.31	0.000
12.083	2.57	0.81	2.21	0.000
12.167	2.37	0.74	2.83	0.000
12.250	1.99	0.62	2.16	0.000
12.333	1.90	0.59	1.61	0.000
12.417	1.81	0.57	1.81	0.000
12.500	2.13	0.67	1.72	0.000

12.583	1.86	0.58	2.46	0.000
12.667	1.55	0.50	1.59	0.000
12.750	1.48	0.50	1.46	0.000
12.833	1.61	0.50	1.42	0.000
12.917	1.77	0.56	1.48	0.000
13.000	1.32	0.50	1.85	0.000
13.083	1.23	0.50	1.65	0.000
13.167	1.33	0.50	1.21	0.000
13.250	1.44	0.50	1.24	0.000
13.333	1.22	0.50	1.32	0.000
13.417	1.00	0.50	1.43	0.000
13.500	1.26	0.50	1.23	0.000
13.583	1.18	0.50	1.01	0.000
13.667	0.88	0.50	1.24	0.000
13.750	0.97	0.50	1.19	0.000
13.833	1.09	0.50	0.91	0.000
13.917	1.11	0.50	0.96	0.000
14.000	1.28	0.50	1.08	0.000
14.083	1.23	0.50	1.11	0.000
14.167	1.18	0.50	1.27	0.000
14.250	1.12	0.50	1.24	0.000
14.333	1.07	0.50	1.18	0.000
14.417	1.03	0.50	1.13	0.000
14.500	0.98	0.50	1.08	0.000
14.583	0.93	0.50	1.03	0.000
14.667	0.89	0.50	0.98	0.000
14.750	0.85	0.50	0.94	0.000
14.833	0.81	0.50	0.90	0.000
14.917	0.78	0.50	0.85	0.000
15.000	0.74	0.50	0.82	0.000
15.083	0.71	0.50	0.78	0.000
15.167	0.68	0.50	0.74	0.000
15.250	0.64	0.50	0.71	0.000
15.333	0.62	0.50	0.68	0.000
15.417	0.59	0.50	0.65	0.000
15.500	0.56	0.50	0.62	0.000
15.583	0.54	0.50	0.59	0.000
15.667	0.51	0.50	0.56	0.000
15.750	0.49	0.50	0.54	0.000
15.833	0.47	0.50	0.51	0.000
15.917	0.45	0.50	0.49	0.000
16.000	0.42	0.50	0.47	0.000
16.083	0.41	0.50	0.45	0.000
16.167	0.39	0.50	0.43	0.000
16.250	0.37	0.50	0.41	0.000
16.333	0.35	0.50	0.39	0.000
16.417	0.34	0.50	0.37	0.000
16.500	0.32	0.50	0.35	0.000
16.583	0.31	0.50	0.34	0.000
16.667	0.29	0.50	0.32	0.000
16.750	0.28	0.50	0.31	0.000
16.833	0.27	0.50	0.29	0.000
16.917	0.26	0.50	0.28	0.000
17.000	0.24	0.50	0.27	0.000
17.083	0.23	0.50	0.26	0.000
17.167	0.22	0.50	0.24	0.000
17.250	0.21	0.50	0.23	0.000
17.333	0.20	0.50	0.22	0.000
17.417	0.19	0.50	0.21	0.000
17.500	0.18	0.50	0.20	0.000
17.583	0.18	0.50	0.19	0.000
17.667	0.17	0.50	0.19	0.000
17.750	0.16	0.50	0.18	0.000

17.833	0.15	0.50	0.17	0.000
17.917	0.15	0.50	0.16	0.000
18.000	0.14	0.50	0.15	0.000
18.083	0.13	0.50	0.15	0.000
18.167	0.13	0.50	0.14	0.000
18.250	0.12	0.50	0.13	0.000
18.333	0.12	0.50	0.13	0.000
18.417	0.11	0.50	0.12	0.000
18.500	0.11	0.50	0.12	0.000
18.583	0.10	0.50	0.11	0.000
18.667	0.10	0.50	0.11	0.000
18.750	0.09	0.50	0.10	0.000
18.833	0.09	0.50	0.10	0.000
18.917	0.08	0.50	0.09	0.000
19.000	0.08	0.50	0.09	0.000
19.083	0.08	0.50	0.08	0.000
19.167	0.07	0.50	0.08	0.000
19.250	0.07	0.50	0.08	0.000
19.333	0.07	0.50	0.07	0.000
19.417	0.06	0.50	0.07	0.000
19.500	0.06	0.50	0.07	0.000
19.583	0.06	0.50	0.06	0.000
19.667	0.06	0.50	0.06	0.000
19.750	0.05	0.50	0.06	0.000
19.833	0.05	0.50	0.06	0.000
19.917	0.05	0.50	0.05	0.000
20.000	0.05	0.50	0.05	0.000
20.083	0.04	0.50	0.05	0.000
20.167	0.04	0.50	0.05	0.000
20.250	0.04	0.50	0.04	0.000
20.333	0.04	0.50	0.04	0.000
20.417	0.04	0.50	0.04	0.000
20.500	0.03	0.50	0.04	0.000
20.583	0.03	0.50	0.04	0.000
20.667	0.03	0.50	0.03	0.000
20.750	0.03	0.50	0.03	0.000
20.833	0.03	0.50	0.03	0.000
20.917	0.03	0.50	0.03	0.000
21.000	0.03	0.50	0.03	0.000
21.083	0.03	0.50	0.03	0.000
21.167	0.02	0.50	0.03	0.000
21.250	0.02	0.50	0.03	0.000
21.333	0.02	0.50	0.02	0.000
21.417	0.02	0.50	0.02	0.000
21.500	0.02	0.50	0.02	0.000
21.583	0.02	0.50	0.02	0.000
21.667	0.02	0.50	0.02	0.000
21.750	0.02	0.50	0.02	0.000
21.833	0.02	0.50	0.02	0.000
21.917	0.02	0.50	0.02	0.000
22.000	0.02	0.50	0.02	0.000
22.083	0.01	0.50	0.02	0.000
22.167	0.01	0.50	0.02	0.000
22.250	0.01	0.50	0.01	0.000
22.333	0.01	0.50	0.01	0.000
22.417	0.01	0.50	0.01	0.000
22.500	0.01	0.50	0.01	0.000
22.583	0.01	0.50	0.01	0.000
22.667	0.01	0.50	0.01	0.000
22.750	0.01	0.50	0.01	0.000
22.833	0.01	0.50	0.01	0.000
22.917	0.01	0.50	0.01	0.000
23.000	0.01	0.50	0.01	0.000

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          23.083      0.01      0.50      0.01        0.000
          23.167      0.01      0.50      0.01        0.000
          23.250      0.01      0.50      0.01        0.000
          23.333      0.01      0.50      0.01        0.000
          23.417      0.01      0.50      0.01        0.000
          23.500      0.01      0.50      0.01        0.000
          23.583      0.01      0.50      0.01        0.000
          23.667      0.01      0.50      0.01        0.000
          23.750      0.01      0.50      0.01        0.000
          23.833      0.01      0.50      0.01        0.000
          23.917      0.01      0.50      0.01        0.000
          24.000      0.00      0.50      0.01        0.000


****************************************************************************
  FLOW PROCESS FROM NODE     99.00 TO NODE     99.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
============================================================================

            STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
        (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      175.0     350.0     525.0     700.0
----------------------------------------------------------------------------
   0.083      0.0000      0.00  Q         .         .         .         .
   0.167      0.0173      2.51  Q         .         .         .         .
   0.250      0.2193     29.33  VQ        .         .         .         .
   0.333      0.5027     41.15  V Q       .         .         .         .
   0.417      0.8215     46.29  V Q       .         .         .         .
   0.500      1.2168     57.39  V  Q      .         .         .         .
   0.583      1.6999     70.15  V   Q     .         .         .         .
   0.667      2.2330     77.41  V   Q     .         .         .         .
   0.750      2.8293     86.58  V   Q     .         .         .         .
   0.833      3.4842     95.09  .V   Q    .         .         .         .
   0.917      4.1724     99.92  .V   Q    .         .         .         .
   1.000      4.8942    104.81  .V   Q    .         .         .         .
   1.083      5.6792    113.98  .V    Q   .         .         .         .
   1.167      6.5636    128.42  . V    Q  .         .         .         .
   1.250      7.5465    142.71  . V     Q .         .         .         .
   1.333      8.6036    153.48  . V     Q .         .         .         .
   1.417      9.7224    162.46  .  V     Q.         .         .         .
   1.500     10.9430    177.23  .  V      Q         .         .         .
   1.583     12.2747    193.36  .  V      .Q        .         .         .
   1.667     13.6892    205.39  .   V     .Q        .         .         .
   1.750     15.2011    219.53  .   V     . Q       .         .         .
   1.833     16.8554    240.20  .    V    .  Q      .         .         .
   1.917     18.6337    258.22  .     V   .   Q     .         .         .
   2.000     20.4944    270.17  .     V   .    Q    .         .         .
   2.083     22.4456    283.31  .      V  .     Q   .         .         .
   2.167     24.5685    308.25  .      V  .      Q  .         .         .
   2.250     26.9924    351.95  .       V .         Q         .         .
   2.333     29.7223    396.38  .        V.         . Q       .         .
   2.417     32.6887    430.71  .         V         .   Q     .         .
   2.500     36.0936    494.40  .         .V        .       Q .         .
   2.583     40.0506    574.56  .         .  V      .         . Q       .
   2.667     44.4973    645.65  .         .   V     .         .     Q   .
   2.750     49.0534    661.54  .         .    V    .         .      Q  .
   2.833     53.2874    614.77  .         .      V  .         .    Q    .
   2.917     57.1445    560.05  .         .       V .         . Q       .
   3.000     60.7442    522.68  .         .        V.        Q.         .
   3.083     64.1019    487.54  .         .         V      Q  .         .
   3.167     67.2303    454.24  .         .         .V   Q    .         .
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3.250     70.1710    426.99  .         .         . V Q     .         .
3.333     72.9680    406.12  .         .         .  Q      .         .
3.417     75.6464    388.91  .         .         . Q V     .         .
3.500     78.2119    372.52  .         .         .Q   V    .         .
3.583     80.6705    356.98  .         .         Q     V   .         .
3.667     83.0278    342.29  .         .        Q.     V   .         .
3.750     85.2843    327.63  .         .       Q .      V  .         .
3.833     87.4305    311.64  .         .      Q  .       V .         .
3.917     89.4521    293.52  .         .     Q   .        V.         .
4.000     91.3493    275.47  .         .    Q    .        V.         .
4.083     93.1276    258.21  .         .   Q     .         V         .
4.167     94.7916    241.61  .         .  Q      .         V         .
4.250     96.3463    225.75  .         . Q       .         .V        .
4.333     97.7972    210.67  .         . Q       .         .V        .
4.417     99.1484    196.20  .         .Q        .         . V       .
4.500    100.3951    181.01  .         Q         .         . V       .
4.583    101.5257    164.17  .        Q.         .         . V       .
4.667    102.5442    147.89  .       Q .         .         .  V      .
4.750    103.4780    135.59  .      Q  .         .         .  V      .
4.833    104.3572    127.66  .      Q  .         .         .  V      .
4.917    105.1966    121.88  .     Q   .         .         .   V     .
5.000    106.0008    116.77  .     Q   .         .         .   V     .
5.083    106.7715    111.90  .     Q   .         .         .   V     .
5.167    107.5095    107.16  .     Q   .         .         .   V     .
5.250    108.2156    102.53  .    Q    .         .         .    V    .
5.333    108.8907     98.03  .    Q    .         .         .    V    .
5.417    109.5359     93.67  .    Q    .         .         .    V    .
5.500    110.1515     89.39  .    Q    .         .         .    V    .
5.583    110.7394     85.37  .   Q     .         .         .    V    .
5.667    111.3010     81.54  .   Q     .         .         .     V   .
5.750    111.8373     77.88  .   Q     .         .         .     V   .
5.833    112.3496     74.38  .   Q     .         .         .     V   .
5.917    112.8388     71.04  .   Q     .         .         .     V   .
6.000    113.3061     67.85  .  Q      .         .         .     V   .
6.083    113.7523     64.80  .  Q      .         .         .     V   .
6.167    114.1784     61.86  .  Q      .         .         .      V  .
6.250    114.5849     59.03  .  Q      .         .         .      V  .
6.333    114.9732     56.38  .  Q      .         .         .      V  .
6.417    115.3440     53.85  .  Q      .         .         .      V  .
6.500    115.6982     51.43  . Q       .         .         .      V  .
6.583    116.0365     49.12  . Q       .         .         .      V  .
6.667    116.3597     46.92  . Q       .         .         .      V  .
6.750    116.6682     44.80  . Q       .         .         .      V  .
6.833    116.9620     42.66  . Q       .         .         .      V  .
6.917    117.2426     40.73  . Q       .         .         .       V .
7.000    117.5105     38.90  . Q       .         .         .       V .
7.083    117.7664     37.15  . Q       .         .         .       V .
7.167    118.0107     35.48  . Q       .         .         .       V .
7.250    118.2441     33.89  .Q        .         .         .       V .
7.333    118.4670     32.36  .Q        .         .         .       V .
7.417    118.6785     30.71  .Q        .         .         .       V .
7.500    118.8783     29.02  .Q        .         .         .       V .
7.583    119.0691     27.70  .Q        .         .         .       V .
7.667    119.2512     26.45  .Q        .         .         .       V .
7.750    119.4251     25.25  .Q        .         .         .       V .
7.833    119.5911     24.10  .Q        .         .         .       V .
7.917    119.7496     23.01  .Q        .         .         .       V .
8.000    119.9010     21.97  .Q        .         .         .       V .
8.083    120.0454     20.98  .Q        .         .         .       V .
8.167    120.1833     20.02  .Q        .         .         .        V.
8.250    120.3150     19.12  .Q        .         .         .        V.
8.333    120.4407     18.25  .Q        .         .         .        V.
8.417    120.5607     17.42  Q         .         .         .        V.
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8.500	120.6753	16.64	Q	.	.	.	V.
8.583	120.7847	15.88	Q	.	.	.	V.
8.667	120.8891	15.16	Q	.	.	.	V.
8.750	120.9888	14.48	Q	.	.	.	V.
8.833	121.0852	14.00	Q	.	.	.	V.
8.917	121.1791	13.64	Q	.	.	.	V.
9.000	121.2657	12.57	Q	.	.	.	V.
9.083	121.3483	12.00	Q	.	.	.	V.
9.167	121.4272	11.45	Q	.	.	.	V.
9.250	121.5025	10.94	Q	.	.	.	V.
9.333	121.5744	10.44	Q	.	.	.	V.
9.417	121.6431	9.97	Q	.	.	.	V.
9.500	121.7086	9.52	Q	.	.	.	V.
9.583	121.7712	9.08	Q	.	.	.	V.
9.667	121.8309	8.67	Q	.	.	.	V.
9.750	121.8879	8.28	Q	.	.	.	V.
9.833	121.9424	7.91	Q	.	.	.	V.
9.917	121.9944	7.55	Q	.	.	.	V.
10.000	122.0440	7.21	Q	.	.	.	V.
10.083	122.0914	6.88	Q	.	.	.	V.
10.167	122.1380	6.78	Q	.	.	.	V.
10.250	122.1841	6.68	Q	.	.	.	V.
10.333	122.2251	5.96	Q	.	.	.	V.
10.417	122.2643	5.69	Q	.	.	.	V.
10.500	122.3017	5.43	Q	.	.	.	V.
10.583	122.3373	5.18	Q	.	.	.	V.
10.667	122.3714	4.95	Q	.	.	.	V.
10.750	122.4040	4.72	Q	.	.	.	V.
10.833	122.4350	4.51	Q	.	.	.	V.
10.917	122.4647	4.31	Q	.	.	.	V.
11.000	122.4956	4.49	Q	.	.	.	V.
11.083	122.5243	4.17	Q	.	.	.	V.
11.167	122.5499	3.72	Q	.	.	.	V.
11.250	122.5744	3.55	Q	.	.	.	V.
11.333	122.5977	3.39	Q	.	.	.	V.
11.417	122.6206	3.32	Q	.	.	.	V.
11.500	122.6423	3.15	Q	.	.	.	V.
11.583	122.6625	2.94	Q	.	.	.	V.
11.667	122.6852	3.30	Q	.	.	.	V.
11.750	122.7073	3.20	Q	.	.	.	V.
11.833	122.7219	2.13	Q	.	.	.	V.
11.917	122.7386	2.42	Q	.	.	.	V.
12.000	122.7545	2.31	Q	.	.	.	V.
12.083	122.7697	2.21	Q	.	.	.	V.
12.167	122.7892	2.83	Q	.	.	.	V.
12.250	122.8040	2.16	Q	.	.	.	V.
12.333	122.8151	1.61	Q	.	.	.	V.
12.417	122.8275	1.81	Q	.	.	.	V.
12.500	122.8394	1.72	Q	.	.	.	V.
12.583	122.8563	2.46	Q	.	.	.	V.
12.667	122.8673	1.59	Q	.	.	.	V.
12.750	122.8773	1.46	Q	.	.	.	V.
12.833	122.8871	1.42	Q	.	.	.	V.
12.917	122.8973	1.48	Q	.	.	.	V.
13.000	122.9101	1.85	Q	.	.	.	V.
13.083	122.9214	1.65	Q	.	.	.	V.
13.167	122.9298	1.21	Q	.	.	.	V.
13.250	122.9383	1.24	Q	.	.	.	V.
13.333	122.9474	1.32	Q	.	.	.	V.
13.417	122.9573	1.43	Q	.	.	.	V.
13.500	122.9658	1.23	Q	.	.	.	V.
13.583	122.9727	1.01	Q	.	.	.	V.
13.667	122.9813	1.24	Q	.	.	.	V.

13.750	122.9895	1.19	Q	.	.	.	V.
13.833	122.9957	0.91	Q	.	.	.	V.
13.917	123.0023	0.96	Q	.	.	.	V.
14.000	123.0097	1.08	Q	.	.	.	V.
14.083	123.0173	1.11	Q	.	.	.	V.
14.167	123.0261	1.27	Q	.	.	.	V.
14.250	123.0346	1.24	Q	.	.	.	V.
14.333	123.0428	1.18	Q	.	.	.	V.
14.417	123.0505	1.13	Q	.	.	.	V.
14.500	123.0580	1.08	Q	.	.	.	V.
14.583	123.0651	1.03	Q	.	.	.	V.
14.667	123.0718	0.98	Q	.	.	.	V.
14.750	123.0783	0.94	Q	.	.	.	V.
14.833	123.0844	0.90	Q	.	.	.	V.
14.917	123.0903	0.85	Q	.	.	.	V.
15.000	123.0960	0.82	Q	.	.	.	V.
15.083	123.1013	0.78	Q	.	.	.	V.
15.167	123.1064	0.74	Q	.	.	.	V.
15.250	123.1113	0.71	Q	.	.	.	V.
15.333	123.1160	0.68	Q	.	.	.	V.
15.417	123.1205	0.65	Q	.	.	.	V.
15.500	123.1247	0.62	Q	.	.	.	V.
15.583	123.1288	0.59	Q	.	.	.	V.
15.667	123.1327	0.56	Q	.	.	.	V.
15.750	123.1364	0.54	Q	.	.	.	V.
15.833	123.1399	0.51	Q	.	.	.	V.
15.917	123.1433	0.49	Q	.	.	.	V.
16.000	123.1465	0.47	Q	.	.	.	V.
16.083	123.1496	0.45	Q	.	.	.	V.
16.167	123.1525	0.43	Q	.	.	.	V.
16.250	123.1553	0.41	Q	.	.	.	V.
16.333	123.1580	0.39	Q	.	.	.	V.
16.417	123.1605	0.37	Q	.	.	.	V.
16.500	123.1630	0.35	Q	.	.	.	V.
16.583	123.1653	0.34	Q	.	.	.	V.
16.667	123.1675	0.32	Q	.	.	.	V.
16.750	123.1696	0.31	Q	.	.	.	V.
16.833	123.1717	0.29	Q	.	.	.	V.
16.917	123.1736	0.28	Q	.	.	.	V.
17.000	123.1755	0.27	Q	.	.	.	V.
17.083	123.1772	0.26	Q	.	.	.	V.
17.167	123.1789	0.24	Q	.	.	.	V.
17.250	123.1805	0.23	Q	.	.	.	V.
17.333	123.1821	0.22	Q	.	.	.	V.
17.417	123.1835	0.21	Q	.	.	.	V.
17.500	123.1849	0.20	Q	.	.	.	V.
17.583	123.1862	0.19	Q	.	.	.	V.
17.667	123.1875	0.19	Q	.	.	.	V.
17.750	123.1887	0.18	Q	.	.	.	V.
17.833	123.1899	0.17	Q	.	.	.	V.
17.917	123.1910	0.16	Q	.	.	.	V.
18.000	123.1921	0.15	Q	.	.	.	V.
18.083	123.1931	0.15	Q	.	.	.	V.
18.167	123.1941	0.14	Q	.	.	.	V.
18.250	123.1950	0.13	Q	.	.	.	V.
18.333	123.1959	0.13	Q	.	.	.	V.
18.417	123.1967	0.12	Q	.	.	.	V.
18.500	123.1975	0.12	Q	.	.	.	V.
18.583	123.1983	0.11	Q	.	.	.	V.
18.667	123.1990	0.11	Q	.	.	.	V.
18.750	123.1997	0.10	Q	.	.	.	V.
18.833	123.2003	0.10	Q	.	.	.	V.
18.917	123.2010	0.09	Q	.	.	.	V.

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   19.000    123.2016      0.09  Q          .          .          .        V.
   19.083    123.2022      0.08  Q          .          .          .        V.
   19.167    123.2027      0.08  Q          .          .          .        V.
   19.250    123.2033      0.08  Q          .          .          .        V.
   19.333    123.2038      0.07  Q          .          .          .        V.
   19.417    123.2042      0.07  Q          .          .          .        V.
   19.500    123.2047      0.07  Q          .          .          .        V.
   19.583    123.2051      0.06  Q          .          .          .        V.
   19.667    123.2056      0.06  Q          .          .          .        V.
   19.750    123.2060      0.06  Q          .          .          .        V.
   19.833    123.2063      0.06  Q          .          .          .        V.
   19.917    123.2067      0.05  Q          .          .          .        V.
   20.000    123.2071      0.05  Q          .          .          .        V.
-------------------------------------------------------------------------------
---
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    =======================                =========
              0%                            1205.0
             10%                             330.0
             20%                             215.0
             30%                             165.0
             40%                             125.0
             50%                              90.0
             60%                              60.0
             70%                              40.0
             80%                              25.0
             90%                              15.0
 ============================================================================

   END OF FLOODSCx ROUTING ANALYSIS
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APPENDIX B.4
CALIMESA CHANNEL HYDROLOGY
AVERAGE ADJUSTED LOSS RATES

SYNTETIC UNIT HYDROGRAPH METHOD

APPENDIX B.4

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 7 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-(IN/HR) [4] (1-.9[6])	[8] AREA SQUARE UNITS (AC)	[9] [8] / SUM [8]	[10] AVERAGE ADJUSTED INFILTRATION RATE (IN/HR) [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	92.90	0.1572	0.0302
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	448.40	0.7586	0.1252
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	2.80	0.0047	0.0004
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	21.40	0.0362	0.0021
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	2.10	0.0036	0.0004
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	23.50	0.0398	0.0039
						SUM [8]=	591.1	F = SUM [10]=	**0.1621**
						Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2=			**0.0811**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 6 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-(IN/HR) [4] (1-.9[6])	[8] AREA SQUARE UNITS (AC)	[9] [8] / SUM [8]	[10] AVERAGE ADJUSTED INFILTRATION RATE (IN/HR) [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	5.30	0.2573	0.0425
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	15.30	0.7427	0.0423
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	0.00	0.0000	0.0000
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000
						SUM [8]=	20.6	F = SUM [10]=	**0.0848**
								Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2=	**0.0424**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 5 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] **SOIL GROUP** (PLATE C-1)	[2] **COVER TYPE**	[3] **RI NUMBER** (PLATE E-6.1)	[4] **PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III** (PLATE E-6.2)	[5] **LAND USE**	[6] **DECIMAL PERCENT OF AREA IMPERVIOUS** (PLATE E-6.3)	[7] **ADJUSTED INFILTRATION RATE-(IN/HR)** [4] (1-.9[6])	[8] **AREA SQUARE UNITS (AC)**	[9] **[8] / SUM [8]**	[10] **AVERAGE ADJUSTED INFILTRATION RATE (IN/HR)** [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	17.80	1.0000	0.1650
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	0.00	0.0000	0.0000
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000

SUM [8]= 17.8 F = SUM [10]= **0.1650**

Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2= **0.0825**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 4 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-(IN/HR) [4] (1-.9[6])	[8] AREA SQUARE UNITS (AC)	[9] [8] / SUM [8]	[10] AVERAGE ADJUSTED INFILTRATION RATE (IN/HR) [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	97.90	0.6655	0.1098
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	3.40	0.0231	0.0019
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	17.80	0.1210	0.0069
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	27.50	0.1869	0.0182
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/2 ACRE	0.4	0.1216	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/4 ACRE	0.5	0.1045	0.50	0.0034	0.0004
C	Residential-Ls.-Good cover	69	0.19	Apartments	0.8	0.0532	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Commercial	0.9	0.0361	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Condominius	0.65	0.07885	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Mobil home Park	0.75	0.06175	0.00	0.0000	0.0000
C	Barren Natural	91	0.04	Natural	0	0.04	0.00	0.0000	0.0000
						SUM [8]=	147.10	F = SUM [10]=	**0.1372**
								Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2=	**0.0686**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 3 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] **SOIL GROUP** (PLATE C-1)	[2] **COVER TYPE**	[3] **RI NUMBER** (PLATE E-6.1)	[4] **PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III** (PLATE E-6.2)	[5] **LAND USE**	[6] **DECIMAL PERCENT OF AREA IMPERVIOUS** (PLATE E-6.3)	[7] **ADJUSTED INFILTRATION RATE-(IN/HR)** [4] (1-.9[6])	[8] **AREA SQUARE UNITS (AC)**	[9] [8] / SUM [8]	[10] **AVERAGE ADJUSTED INFILTRATION RATE (IN/HR)** [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	5.10	0.7183	0.1185
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	1.20	0.1690	0.0210
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	0.00	0.0000	0.0000
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/2 ACRE	0.4	0.1216	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/4 ACRE	0.5	0.1045	0.40	0.0563	0.0059
C	Residential-Ls.-Good cover	69	0.19	Apartments	0.8	0.0532	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Commercial	0.9	0.0361	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Condominius	0.65	0.07885	0.40	0.0563	0.0044
C	Residential-Ls.-Good cover	69	0.19	Mobil home Park	0.75	0.06175	0.00	0.0000	0.0000
C	Barren Natural	91	0.04	Natural	0	0.04	0.00	0.0000	0.0000
						SUM [8]=	7.10	F = SUM [10]=	**0.1499**
								Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2=	**0.0749**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 2 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-(IN/HR) [4] (1-.9[6])	[8] AREA SQUARE UNITS (AC)	[9] [8] / SUM [8]	[10] AVERAGE ADJUSTED INFILTRATION RATE (IN/HR) [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	1.30	0.0992	0.0191
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	8.80	0.6718	0.0383
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	3.00	0.2290	0.0223
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000

SUM [8]= 13.10 F = SUM [10]= **0.0797**

Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2= **0.0398**

HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM CALIMESA CHANNEL STAGE III - PROPOSED CONDITION RIVERSIDE COUNTY	AREA 1 CALC. BY: OP 4/18/2018 CHECKED:

AVERAGE ADJUSTED LOSS RATE

[1] **SOIL GROUP** (PLATE C-1)	[2] **COVER TYPE**	[3] **RI NUMBER** (PLATE E-6.1)	[4] **PERVIOUS AREA INFILTRATION RATE (IN/HR) AMC III** (PLATE E-6.2)	[5] **LAND USE**	[6] **DECIMAL PERCENT OF AREA IMPERVIOUS** (PLATE E-6.3)	[7] **ADJUSTED INFILTRATION RATE-(IN/HR)** [4] (1-.9[6])	[8] **AREA SQUARE UNITS (AC)**	[9] [8] / SUM [8]	[10] **AVERAGE ADJUSTED INFILTRATION RATE (IN/HR)** [7]*[9]
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/2 ACRE	0.4	0.192	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	S.F. 1/4 ACRE	0.5	0.165	6.90	0.2604	0.0430
B	Residential-Ls.-Good cover	56	0.3	Apartments	0.8	0.084	1.10	0.0415	0.0035
B	Residential-Ls.-Good cover	56	0.3	Commercial	0.9	0.057	11.00	0.4151	0.0237
B	Residential-Ls.-Good cover	56	0.3	Condominius	0.65	0.1245	0.00	0.0000	0.0000
B	Residential-Ls.-Good cover	56	0.3	Mobil home Park	0.75	0.0975	0.00	0.0000	0.0000
B	Barren Natural	86	0.07	Natural	0	0.07	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/2 ACRE	0.4	0.1216	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	S.F. 1/4 ACRE	0.5	0.1045	2.10	0.0792	0.0083
C	Residential-Ls.-Good cover	69	0.19	Apartments	0.8	0.0532	0.10	0.0038	0.0002
C	Residential-Ls.-Good cover	69	0.19	Commercial	0.9	0.0361	1.90	0.0717	0.0026
C	Residential-Ls.-Good cover	69	0.19	Condominius	0.65	0.07885	0.00	0.0000	0.0000
C	Residential-Ls.-Good cover	69	0.19	Mobil home Park	0.75	0.06175	0.00	0.0000	0.0000
C	Barren Natural	91	0.04	Natural	0	0.04	0.00	0.0000	0.0000
D	Residential-Ls.-Good cover	75	0.15	S.F. 1/2 ACRE	0.4	0.096	0.00	0.0000	0.0000
D	Residential-Ls.-Good cover	75	0.15	S.F. 1/4 ACRE	0.5	0.0825	1.60	0.0604	0.0050
D	Residential-Ls.-Good cover	75	0.15	Apartments	0.8	0.042	0.00	0.0000	0.0000
D	Residential-Ls.-Good cover	75	0.15	Commercial	0.9	0.0285	1.80	0.0679	0.0019
D	Residential-Ls.-Good cover	75	0.15	Condominius	0.65	0.06225	0.00	0.0000	0.0000
D	Residential-Ls.-Good cover	75	0.15	Mobil home Park	0.75	0.04875	0.00	0.0000	0.0000
D	Barren Natural	93	0.03	Natural	0	0.03	0.00	0.0000	0.0000
						SUM [8]=	26.50	F = SUM [10]=	**0.0881**
								Fm = Minimum Loss Rate ~ F/2 = SUM[10]/2=	**0.0440**

APPENDIX C
CULVERT ANALYSIS

APPENDIX C.1

EXISTING 78 INCH RCP CULVERT ANALYSIS

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Apr 18 2018

APPENDIX C.1 - 78 inch RCP at Baker's - Max. Q - Existing Condition

Invert Elev Dn (ft)	=	2360.36
Pipe Length (ft)	=	220.23
Slope (%)	=	2.35
Invert Elev Up (ft)	=	2365.54
Rise (in)	=	78.0
Shape	=	Circular
Span (in)	=	78.0
No. Barrels	=	1
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0018, 2, 0.0292, 0.74, 0.2

Embankment

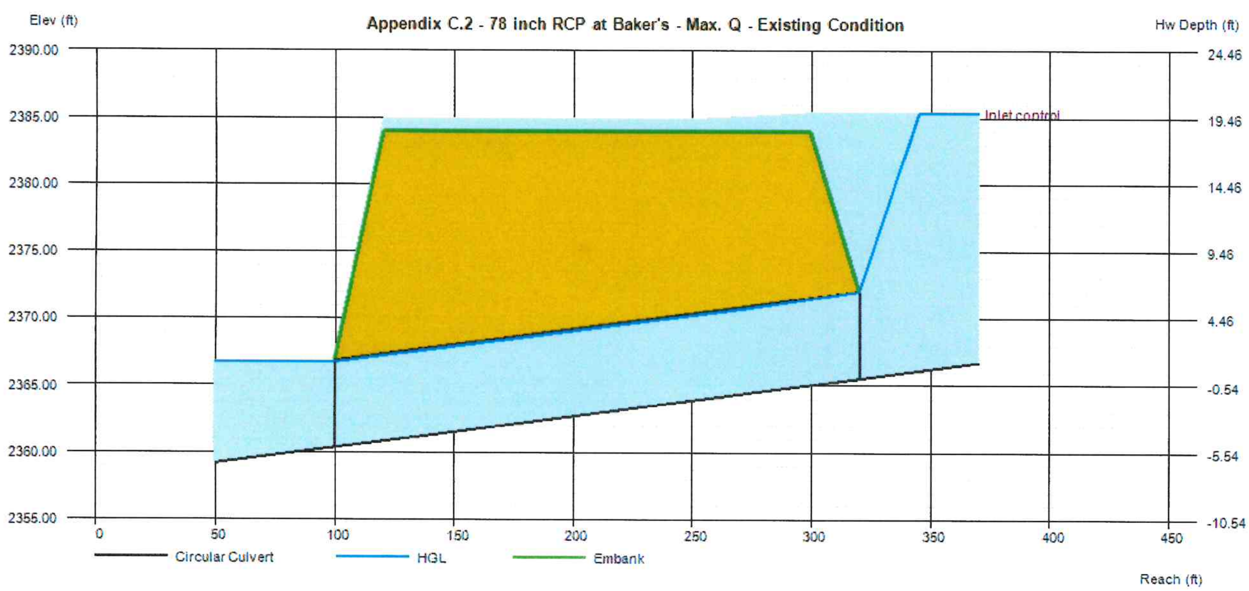
Top Elevation (ft)	=	2384.00
Top Width (ft)	=	179.00
Crest Width (ft)	=	60.00

Calculations

Qmin (cfs)	=	1051.00
Qmax (cfs)	=	1051.00
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	1051.00
Qpipe (cfs)	=	754.30
Qovertop (cfs)	=	296.70
Veloc Dn (ft/s)	=	22.79
Veloc Up (ft/s)	=	22.88
HGL Dn (ft)	=	2366.78
HGL Up (ft)	=	2371.88
Hw Elev (ft)	=	2385.36
Hw/D (ft)	=	3.05
Flow Regime	=	Inlet Control



APPENDIX C.2

PROPOSED 54 INCH RCP
CULVERT ANALYSIS

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Apr 18 2018

APPENDIX C.2 - 54 inch CMP at Park Avenue - Max. Q - Existing Condition

Invert Elev Dn (ft)	= 2402.35
Pipe Length (ft)	= 97.30
Slope (%)	= 3.08
Invert Elev Up (ft)	= 2405.35
Rise (in)	= 54.0
Shape	= Circular
Span (in)	= 54.0
No. Barrels	= 1
n-Value	= 0.024
Culvert Type	= Circular Corrugate Metal Pipe
Culvert Entrance	= Projecting
Coeff. K,M,c,Y,k	= 0.034, 1.5, 0.0553, 0.54, 0.9

Embankment

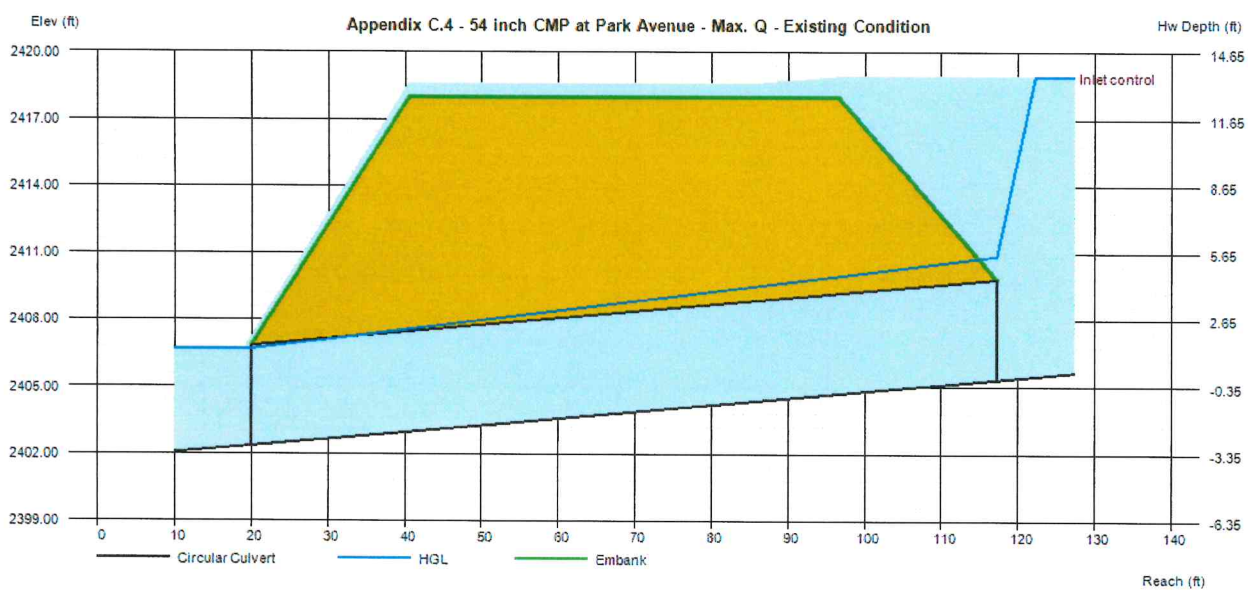
Top Elevation (ft)	= 2418.00
Top Width (ft)	= 56.00
Crest Width (ft)	= 300.00

Calculations

Qmin (cfs)	= 1043.00
Qmax (cfs)	= 1043.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 1043.00
Qpipe (cfs)	= 226.39
Qovertop (cfs)	= 816.61
Veloc Dn (ft/s)	= 14.40
Veloc Up (ft/s)	= 14.23
HGL Dn (ft)	= 2406.69
HGL Up (ft)	= 2410.88
Hw Elev (ft)	= 2418.92
Hw/D (ft)	= 3.01
Flow Regime	= Inlet Control



APPENDIX C.3

EXISTING 6 FOOT X 6 FOOT RCB CULVERT ANALYSIS

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, Apr 18 2018

APPENDIX C.3 - 6'x6' RCB at Calimesa Blvd. - Max. Q - Existing Condition

Invert Elev Dn (ft)	= 2370.50
Pipe Length (ft)	= 161.00
Slope (%)	= 7.66
Invert Elev Up (ft)	= 2382.83
Rise (in)	= 72.0
Shape	= Box
Span (in)	= 72.0
No. Barrels	= 1
n-Value	= 0.015
Culvert Type	= Skewed Headwall, Chamfered or Beveled Inlet Edges
Culvert Entrance	= 3/4-in chamfers, 45D skewed headwall
Coeff. K,M,c,Y,k	= 0.545, 0.667, 0.04505, 0.73, 0.2

Embankment

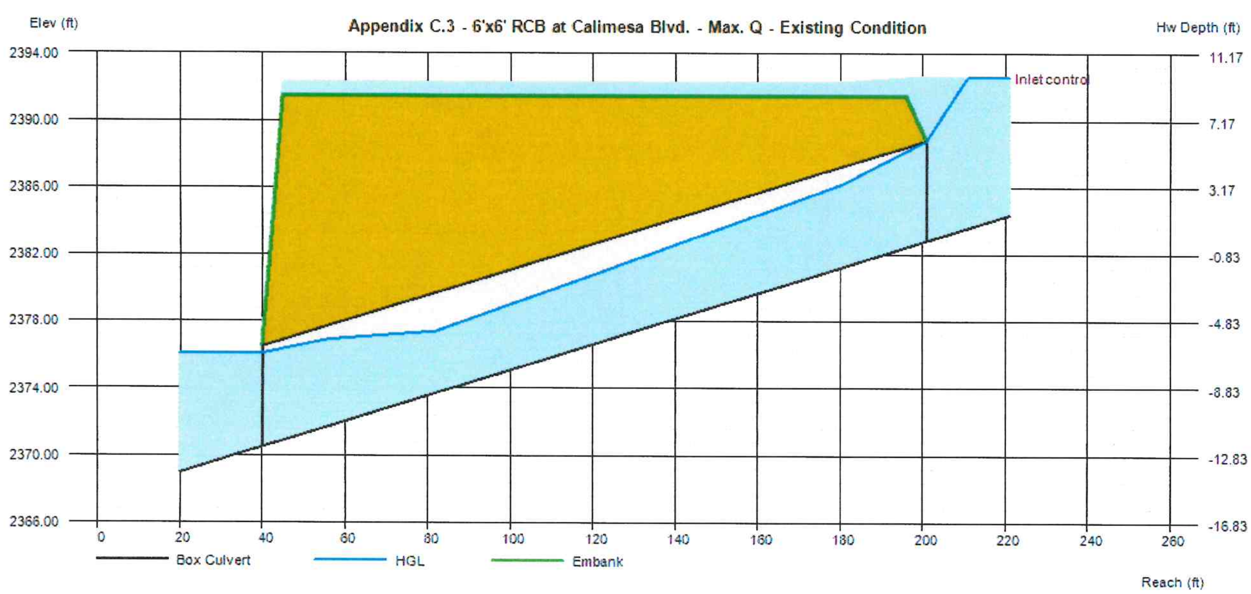
Top Elevation (ft)	= 2391.50
Top Width (ft)	= 151.00
Crest Width (ft)	= 180.00

Calculations

Qmin (cfs)	= 1051.00
Qmax (cfs)	= 1051.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 1051.00
Qpipe (cfs)	= 402.60
Qovertop (cfs)	= 648.40
Veloc Dn (ft/s)	= 12.00
Veloc Up (ft/s)	= 12.94
HGL Dn (ft)	= 2376.09
HGL Up (ft)	= 2388.01
Hw Elev (ft)	= 2392.62
Hw/D (ft)	= 1.63
Flow Regime	= Inlet Control



APPENDIX C.4

PROPOSED DUAL 42 INCH RCP
CULVERT ANALYSIS

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Wednesday, May 2 2018

APPENDIX C.4 - 2-42 inch RCP outlet at 3rd. St. Retarding Basin

Invert Elev Dn (ft)	=	2464.00
Pipe Length (ft)	=	164.36
Slope (%)	=	0.61
Invert Elev Up (ft)	=	2465.00
Rise (in)	=	42.0
Shape	=	Circular
Span (in)	=	42.0
No. Barrels	=	2
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Groove end w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0018, 2, 0.0292, 0.74, 0.2

Embankment

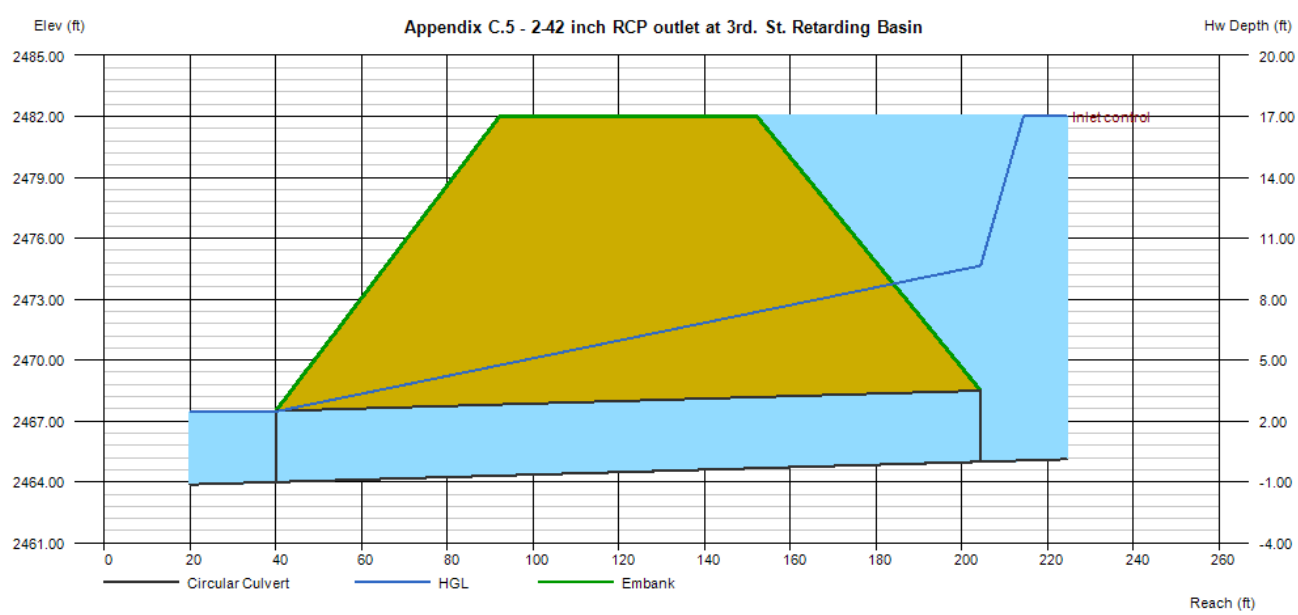
Top Elevation (ft)	=	2482.00
Top Width (ft)	=	60.00
Crest Width (ft)	=	225.00

Calculations

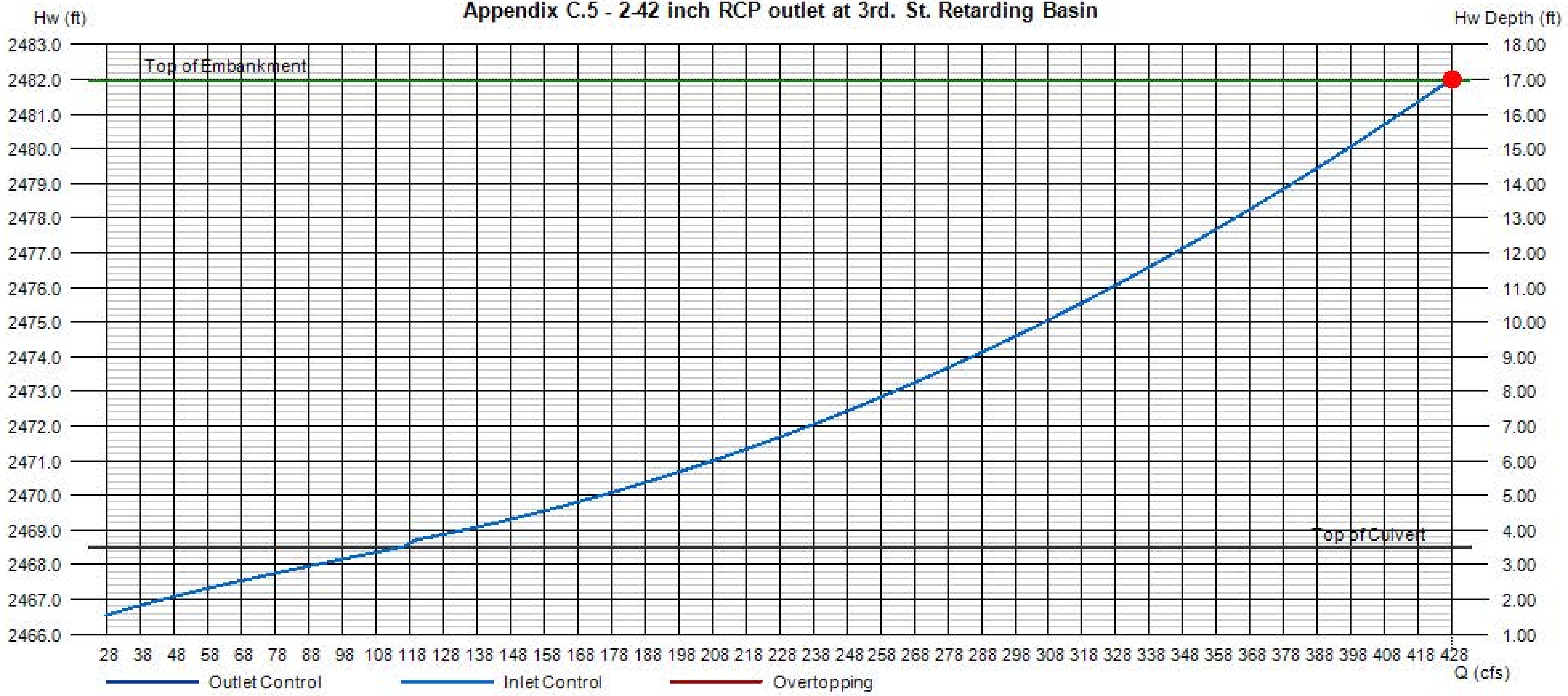
Qmin (cfs)	=	28.00
Qmax (cfs)	=	428.00
Tailwater Elev (ft)	=	Critical

Highlighted

Qtotal (cfs)	=	428.00
Qpipe (cfs)	=	427.65
Qovertop (cfs)	=	0.35
Veloc Dn (ft/s)	=	22.25
Veloc Up (ft/s)	=	22.22
HGL Dn (ft)	=	2467.47
HGL Up (ft)	=	2474.65
Hw Elev (ft)	=	2482.00
Hw/D (ft)	=	4.86
Flow Regime	=	Inlet Control



Appendix C.5 - 2-42 inch RCP outlet at 3rd. St. Retarding Basin



Q			Veloc		Depth		HGL			
Total (cfs)	Pipe (cfs)	Over (cfs)	Dn (ft/s)	Up (ft/s)	Dn (in)	Up (in)	Dn (ft)	Up (ft)	Hw (ft)	Hw/D
28	28	0	6.14	5.17	12.04	13.65	2465.00	2466.14	2466.55	0.44
32	32	0	6.38	5.37	12.9	14.62	2465.08	2466.22	2466.66	0.47
36	36	0	6.55	5.56	13.78	15.54	2465.15	2466.30	2466.77	0.51
40	40	0	6.74	5.74	14.58	16.42	2465.22	2466.37	2466.88	0.54
44	44	0	6.95	5.91	15.28	17.26	2465.27	2466.44	2466.98	0.57
48	48	0	7.13	6.07	15.99	18.05	2465.33	2466.50	2467.08	0.59
52	52	0	7.29	6.22	16.71	18.82	2465.39	2466.57	2467.17	0.62
56	56	0	7.42	6.37	17.43	19.57	2465.45	2466.63	2467.27	0.65
60	60	0	7.53	6.52	18.16	20.29	2465.51	2466.69	2467.36	0.67
64	64	0	7.68	6.66	18.78	20.98	2465.57	2466.75	2467.45	0.7
68	68	0	7.82	6.79	19.41	21.67	2465.62	2466.81	2467.54	0.72
72	72	0	7.95	6.93	20.04	22.32	2465.67	2466.86	2467.62	0.75
76	76	0	8.06	7.06	20.67	22.96	2465.72	2466.91	2467.71	0.77
80	80	0	8.17	7.19	21.3	23.58	2465.78	2466.97	2467.79	0.8
84	84	0	8.27	7.32	21.93	24.19	2465.83	2467.02	2467.87	0.82
88	88	0	8.36	7.45	22.56	24.79	2465.88	2467.07	2467.96	0.84
92	92	0	8.45	7.57	23.19	25.37	2465.93	2467.11	2468.04	0.87
96	96	0	8.53	7.7	23.81	25.93	2465.98	2467.16	2468.12	0.89
100	100	0	8.61	7.82	24.43	26.49	2466.04	2467.21	2468.20	0.91
104	104	0	8.69	7.94	25.05	27.04	2466.09	2467.25	2468.28	0.94
108	108	0	8.07	8.07	27.57	27.57	2466.30	2467.30	2468.36	0.96
112	112	0	8.19	8.19	28.1	28.1	2466.34	2467.34	2468.43	0.98
116	116	0	8.31	8.31	28.6	28.6	2466.38	2467.38	2468.51	1
120	120	0	8.43	8.43	29.1	29.1	2466.43	2467.43	2468.72	1.06
124	124	0	8.56	8.56	29.58	29.58	2466.47	2467.47	2468.79	1.08
128	128	0	8.68	8.69	30.06	30.06	2466.51	2467.51	2468.87	1.11
132	132	0	8.81	8.81	30.53	30.53	2466.54	2467.54	2468.95	1.13
136	136	0	8.94	8.94	30.99	30.99	2466.58	2467.58	2469.04	1.15
140	140	0	9.06	9.04	31.44	31.53	2466.62	2467.63	2469.13	1.18
144	144	0	9.19	9.17	31.87	31.96	2466.66	2467.66	2469.22	1.2
148	148	0	9.32	9.3	32.29	32.38	2466.69	2467.70	2469.31	1.23

Q			Veloc		Depth		HGL			
Total (cfs)	Pipe (cfs)	Over (cfs)	Dn (ft/s)	Up (ft/s)	Dn (in)	Up (in)	Dn (ft)	Up (ft)	Hw (ft)	Hw/D
152	152	0	9.45	9.43	32.7	32.79	2466.73	2467.73	2469.40	1.26
156	156	0	9.59	9.59	33.11	33.11	2466.76	2467.76	2469.50	1.29
160	160	0	9.72	9.72	33.5	33.5	2466.79	2467.79	2469.60	1.31
164	164	0	9.86	9.86	33.88	33.88	2466.82	2467.82	2469.70	1.34
168	168	0	10	10	34.26	34.26	2466.86	2467.86	2469.81	1.37
172	172	0	10.14	10.14	34.61	34.61	2466.88	2467.88	2469.91	1.4
176	176	0	10.28	10.28	34.96	34.96	2466.91	2467.91	2470.02	1.43
180	180	0	10.43	9.35	35.29	42	2466.94	2468.56	2470.14	1.47
184	184	0	10.57	9.56	35.62	42	2466.97	2468.62	2470.25	1.5
188	188	0	10.73	9.77	35.93	42	2466.99	2468.69	2470.37	1.53
192	192	0	10.88	9.98	36.23	42	2467.02	2468.75	2470.49	1.57
196	196	0	11.03	10.19	36.52	42	2467.04	2468.81	2470.61	1.6
200	200	0	11.19	10.39	36.8	42	2467.07	2468.88	2470.73	1.64
204	204	0	11.35	10.6	37.07	42	2467.09	2468.95	2470.86	1.67
208	208	0	11.51	10.81	37.32	42	2467.11	2469.01	2470.99	1.71
212	212	0	11.68	11.02	37.56	42	2467.13	2469.08	2471.12	1.75
216	216	0	11.84	11.23	37.8	42	2467.15	2469.15	2471.26	1.79
220	220	0	12.01	11.43	38.02	42	2467.17	2469.22	2471.40	1.83
224	224	0	12.18	11.64	38.23	42	2467.19	2469.29	2471.54	1.87
228	228	0	12.36	11.85	38.43	42	2467.20	2469.37	2471.68	1.91
232	232	0	12.53	12.06	38.62	42	2467.22	2469.44	2471.82	1.95
236	236	0	12.71	12.26	38.8	42	2467.23	2469.52	2471.97	1.99
240	240	0	12.89	12.47	38.97	42	2467.25	2469.59	2472.12	2.03
244	244	0	13.07	12.68	39.13	42	2467.26	2469.67	2472.27	2.08
248	248	0	13.25	12.89	39.28	42	2467.27	2469.75	2472.43	2.12
252	252	0	13.44	13.1	39.43	42	2467.29	2469.83	2472.59	2.17
256	256	0	13.62	13.3	39.57	42	2467.30	2469.91	2472.75	2.21
260	260	0	13.81	13.51	39.69	42	2467.31	2469.99	2472.91	2.26
264	264	0	14	13.72	39.81	42	2467.32	2470.08	2473.08	2.31
268	268	0	14.19	13.93	39.93	42	2467.33	2470.16	2473.24	2.36
272	272	0	14.38	14.14	40.04	42	2467.34	2470.25	2473.41	2.4

Q			Veloc		Depth		HGL			
Total (cfs)	Pipe (cfs)	Over (cfs)	Dn (ft/s)	Up (ft/s)	Dn (in)	Up (in)	Dn (ft)	Up (ft)	Hw (ft)	Hw/D
276	276	0	14.57	14.34	40.14	42	2467.35	2470.34	2473.59	2.45
280	280	0	14.76	14.55	40.23	42	2467.35	2470.43	2473.76	2.5
284	284	0	14.96	14.76	40.32	42	2467.36	2470.52	2473.94	2.55
288	288	0	15.15	14.97	40.41	42	2467.37	2470.61	2474.12	2.61
292	292	0	15.35	15.17	40.49	42	2467.37	2470.70	2474.30	2.66
296	296	0	15.55	15.38	40.57	42	2467.38	2470.80	2474.49	2.71
300	300	0	15.75	15.59	40.63	42	2467.39	2470.89	2474.68	2.76
304	304	0	15.94	15.8	40.71	42	2467.39	2470.99	2474.87	2.82
308	308	0	16.14	16.01	40.76	42	2467.40	2471.09	2475.06	2.87
312	312	0	16.34	16.21	40.83	42	2467.40	2471.19	2475.26	2.93
316	316	0	16.54	16.42	40.88	42	2467.41	2471.29	2475.45	2.99
320	320	0	16.74	16.63	40.94	42	2467.41	2471.39	2475.66	3.04
324	324	0	16.95	16.84	40.98	42	2467.42	2471.50	2475.86	3.1
328	328	0	17.15	17.05	41.03	42	2467.42	2471.60	2476.06	3.16
332	332	0	17.35	17.25	41.08	42	2467.42	2471.71	2476.27	3.22
336	336	0	17.55	17.46	41.12	42	2467.43	2471.82	2476.48	3.28
340	340	0	17.75	17.67	41.16	42	2467.43	2471.92	2476.70	3.34
344	344	0	17.96	17.88	41.19	42	2467.43	2472.03	2476.91	3.4
348	348	0	18.16	18.09	41.23	42	2467.44	2472.15	2477.13	3.47
352	352	0	18.36	18.29	41.26	42	2467.44	2472.26	2477.35	3.53
356	356	0	18.57	18.5	41.3	42	2467.44	2472.38	2477.57	3.59
360	360	0	18.77	18.71	41.33	42	2467.44	2472.49	2477.80	3.66
364	364	0	18.98	18.92	41.36	42	2467.45	2472.61	2478.03	3.72
368	368	0	19.18	19.12	41.38	42	2467.45	2472.73	2478.26	3.79
372	372	0	19.39	19.33	41.41	42	2467.45	2472.85	2478.49	3.86
376	376	0	19.59	19.54	41.43	42	2467.45	2472.97	2478.73	3.92
380	380	0	19.8	19.75	41.46	42	2467.46	2473.09	2478.97	3.99
384	384	0	20	19.96	41.48	42	2467.46	2473.21	2479.21	4.06
388	388	0	20.21	20.16	41.5	42	2467.46	2473.34	2479.45	4.13
392	392	0	20.41	20.37	41.52	42	2467.46	2473.46	2479.70	4.2
396	396	0	20.62	20.58	41.54	42	2467.46	2473.59	2479.95	4.27

Q			Veloc		Depth		HGL			
Total	Pipe	Over	Dn	Up	Dn	Up	Dn	Up	Hw	Hw/D
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)	(ft)	
400	400	0	20.83	20.79	41.56	42	2467.46	2473.72	2480.20	4.34
404	404	0	21.03	21	41.58	42	2467.47	2473.85	2480.45	4.41
408	408	0	21.24	21.2	41.59	42	2467.47	2473.98	2480.71	4.49
412	412	0	21.44	21.41	41.61	42	2467.47	2474.12	2480.97	4.56
416	416	0	21.65	21.62	41.62	42	2467.47	2474.25	2481.23	4.64
420	420	0	21.86	21.83	41.63	42	2467.47	2474.39	2481.49	4.71
424	424	0	22.06	22.03	41.65	42	2467.47	2474.52	2481.76	4.79
428	427.65	0.35	22.25	22.22	41.66	42	2467.47	2474.65	2482.00	4.86

APPENDIX D
HYDRAULIC CALCULATIONS

APPENDIX D.1

PROPOSED CALIMESA CHANNEL HYDRAULICS
WITH FLOW SPLIT
WSPGW MODEL AND OUTPUT

APPENDIX D.1

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FILE: CCALTX2.WSW                          W S P G W  - EDIT LISTING - Version 14.08            Date: 4- 9-2018  Time:10: 9:45
                                       WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                              PAGE    1
 CARD   SECT   CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL     ZR    INV    Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE    NO    TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                DROP

 CD       2     4      1             6.000
 CD       3     4      1             4.500
 CD       4     4      1             1.500
 CD       5     1      0      .000    5.000    4.000   1.500  1.500    .00
 CD       6     2      0      .000   17.500    9.000                   .00
 CD       8     4      1             6.500
 CD       9     3      0      .000    6.000    6.000    .000   .000    .00
 CD      10     4      1             6.250
 CD      11     3      0      .000    2.000    4.500    .000   .000    .00
 CD       1     5      0         .000
FILE:                                      W S P G W  - EDIT LISTING - Version 14.08            Date: 4- 9-2018  Time:10: 9:45
                                      WATER SURFACE PROFILE - CROSS SECTION POINT LISTING                              PAGE    2
   CARD   SECT   NO OF    X(1) , Y(1)    X(2) , Y(2)    X(3) , Y(3)    X(4) , Y(4)    X(5) , Y(5)    X(6) , Y(6)    X(7) , Y(7)
   CODE    NO   POINTS    X(8) , Y(8)    X(9) , Y(9)   X(10) ,Y(10)   X(11) ,Y(11)    X(N) , Y(N)   X(N+1),Y(N+1)  X(35) ,Y(35)

   PTS     1     4        .000  17.500   17.500    .000   26.500    .000   44.000  17.500
                                                      W S P G W                                                      PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                               CALIMESA CHANNEL STAGE III
HEADING LINE NO 2 IS -
                               OUTFLOW AT EAST OF BAKER'S
HEADING LINE NO 3 IS -
                               RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT
                                                      W S P G W                                                      PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET      *         *     *
                    U/S DATA   STATION    INVERT  SECT                                     W S ELEV
                                457.710 2360.360    1                                       2372.770
 ELEMENT NO   2 IS A TRANSITION         *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS   ANGLE
                                462.710 2360.360    6              .030                            .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO   3 IS A  WALL  EXIT                        *
                    U/S DATA   STATION    INVERT  SECT
                                462.710 2360.360    8
 ELEMENT NO   4 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                468.280 2360.490    8              .013                            .000     .000      .000     0
 ELEMENT NO   5 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                573.000 2362.950    8              .013                          200.000   30.000      .000     0
 ELEMENT NO   6 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                682.940 2365.540    8              .013                            .000     .000      .000     0
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ELEMENT NO   7 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                                749.200 2367.630    8              .013                        180.002  -21.091      .000     1
ELEMENT NO   8 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                                813.100 2369.640    8              .013                           .000     .000      .000     0
ELEMENT NO   9 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                                923.060 2373.100    8              .013                        180.002   35.001      .000     0
ELEMENT NO  10 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                                980.050 2374.900    8              .013                           .000     .000      .000     0
ELEMENT NO  11 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                                994.580 2375.360    8              .013                           .000     .000      .125     0
ELEMENT NO  12 IS A JUNCTION       *         *     *     *                 *                  *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               1001.580 2376.080    2     3     0   .013    99.870      .000  2376.600      .000  69.000     .000
                                                                                            RADIUS    ANGLE
                                                                                              .000     .000
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ELEMENT NO  13 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1082.050 2378.780    2              .013                           .000     .000      .000     0
ELEMENT NO  14 IS A JUNCTION       *         *     *     *                 *                  *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               1084.550 2378.870    2     4     0   .013    16.220      .000  2381.080      .000 -90.000     .000
                                                                                            RADIUS    ANGLE
                                                                                              .000     .000
ELEMENT NO  15 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1156.670 2381.290    2              .013                           .000     .000      .000     0
ELEMENT NO  16 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1188.090 2382.350    2              .013                        180.005  -10.001      .000     0
ELEMENT NO  17 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1196.910 2382.650    2              .013                           .000     .000      .000     0
ELEMENT NO  18 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1228.320 2383.700    2              .013                        180.002    9.998      .000     0
ELEMENT NO  19 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1250.000 2384.430    2              .013                           .000     .000      .000     0
ELEMENT NO  20 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                               1493.700 2389.190    2              .013                           .000     .000      .000     0
ELEMENT NO  21 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
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                               1875.260 2396.630    2             .013                            .000     .000     -.002     1
ELEMENT NO  22 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               1927.440 2397.640    2             .013                          180.004  -16.609      .000     1
ELEMENT NO  23 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2163.160 2402.240    2             .013                            .000     .000      .000     0
ELEMENT NO  24 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2427.080 2407.390    2             .013                            .000     .000     -.013     1
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ELEMENT NO  25 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2500.000 2408.808    2             .013                          135.001   30.948      .000     0
ELEMENT NO  26 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2617.940 2411.810    2             .013                          135.001   50.055      .000     0
ELEMENT NO  27 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2627.070 2412.040    2             .013                            .000     .000      .000     0
ELEMENT NO  28 IS A TRANSITION        *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS   ANGLE
                               2637.070 2412.290    9             .013                            .000     .000
ELEMENT NO  29 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2723.980 2414.510    9             .013                          225.004  -22.131      .000     0
ELEMENT NO  30 IS A JUNCTION          *         *     *     *                  *                   *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               2730.750 2414.680    9    11     0   .013   -61.040      .000  2414.540      .000  90.000     .000
                                                                                                RADIUS    ANGLE
                                                                                               224.996  -1.724
ELEMENT NO  31 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2755.170 2415.300    9             .013                          225.017   -6.218      .000     0
ELEMENT NO  32 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS    ANGLE     ANG PT  MAN H
                               2806.810 2416.610    9             .013                            .000     .000      .000     0
ELEMENT NO  33 IS A TRANSITION        *         *     *
                    U/S DATA   STATION    INVERT  SECT             N                            RADIUS   ANGLE
                               2866.810 2421.110    5             .014                            .000     .000
ELEMENT NO  34 IS A SYSTEM HEADWORKS                  *                      *
                    U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                               2866.810 2421.110    5                                    2424.440
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APPENDIX D.1

Program Package Serial Number: 7006

WATER SURFACE PROFILE LISTING Date: 4- 9-2018 Time:10: 9:50

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
457.710	2360.360	12.410	2372.770	662.64	2.49	.10	2372.87	.00	4.62	33.82		1		0 .0
TRANS STR	.0000					.0016	.01	12.41	.16		.030			IR-OPEN
462.710	2360.360	12.183	2372.543	662.64	6.04	.57	2373.11	.00	5.52	9.00	17.500	9.000	.00	0 .0
WALL EXIT														
462.710	2360.360	12.184	2372.544	662.64	19.97	6.19	2378.74	.00	6.24	.00	6.500	.000	.00	1 .0
5.570	.0233					.0160	.09	12.18	.00	4.51	.013	.00	.00	PIPE
468.280	2360.490	12.143	2372.633	662.64	19.97	6.19	2378.83	.00	6.24	.00	6.500	.000	.00	1 .0
104.720	.0235					.0160	1.67	.00	.00	4.50	.013	.00	.00	PIPE
573.000	2362.950	12.071	2375.021	662.64	19.97	6.19	2381.21	.00	6.24	.00	6.500	.000	.00	1 .0
109.940	.0236					.0160	1.76	12.07	.00	4.49	.013	.00	.00	PIPE
682.940	2365.540	11.237	2376.777	662.64	19.97	6.19	2382.97	.00	6.24	.00	6.500	.000	.00	1 .0
66.260	.0315					.0160	1.06	.00	.00	4.05	.013	.00	.00	PIPE
749.200	2367.630	11.115	2378.745	662.64	19.97	6.19	2384.94	.00	6.24	.00	6.500	.000	.00	1 .0
63.900	.0315					.0160	1.02	11.12	.00	4.06	.013	.00	.00	PIPE
813.100	2369.640	10.126	2379.766	662.64	19.97	6.19	2385.96	.00	6.24	.00	6.500	.000	.00	1 .0
109.960	.0315					.0160	1.76	.00	.00	4.05	.013	.00	.00	PIPE
923.060	2373.100	9.194	2382.294	662.64	19.97	6.19	2388.49	.00	6.24	.00	6.500	.000	.00	1 .0
56.990	.0316					.0160	.91	9.19	.00	4.05	.013	.00	.00	PIPE

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
980.050	2374.900	8.305	2383.205	662.64	19.97	6.19	2389.40	.00	6.24	.00	6.500	.000	.00	1 .0
14.530	.0317					.0160	.23	8.30	.00	4.05	.013	.00	.00	PIPE
994.580	2375.360	8.079	2383.439	662.64	19.97	6.19	2389.63	.00	6.24	.00	6.500	.000	.00	1 .0
JUNCT STR	.1029					.0168	.12	8.08	.00		.013	.00	.00	PIPE
1001.580	2376.080	9.303	2385.383	562.77	19.90	6.15	2391.53	.00	5.79	.00	6.000	.000	.00	1 .0
80.470	.0336					.0177	1.42	9.30	.00	3.79	.013	.00	.00	PIPE
1082.050	2378.780	8.024	2386.804	562.77	19.90	6.15	2392.96	.00	5.79	.00	6.000	.000	.00	1 .0
JUNCT STR	.0360							8.02	.00		.013	.00	.00	PIPE
1084.550	2378.870	4.088	2382.958	546.55	26.63	11.02	2393.97	.00	5.76	5.59	6.000	.000	.00	1 .0
72.120	.0336					.0244	1.76	4.09	2.45	3.71	.013	.00	.00	PIPE
1156.670	2381.290	4.231	2385.521	546.55	25.65	10.22	2395.74	.62	5.76	5.47	6.000	.000	.00	1 .0
31.420	.0337					.0227	.71	4.85	2.29	3.71	.013	.00	.00	PIPE
1188.090	2382.350	4.316	2386.666	546.55	25.11	9.79	2396.45	.00	5.76	5.39	6.000	.000	.00	1 .0
8.820	.0340					.0220	.19	4.32	2.20	3.70	.013	.00	.00	PIPE
1196.910	2382.650	4.343	2386.993	546.55	24.93	9.65	2396.65	.58	5.76	5.36	6.000	.000	.00	1 .0
31.410	.0334					.0212	.66	4.92	2.17	3.72	.013	.00	.00	PIPE
1228.320	2383.700	4.453	2388.153	546.55	24.29	9.16	2397.31	.00	5.76	5.25	6.000	.000	.00	1 .0
21.680	.0337					.0200	.43	4.45	2.07	3.71	.013	.00	.00	PIPE

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1250.000	2384.430	4.549	2388.979	546.55	23.76	8.77	2397.75	.00	5.76	5.14	6.000	.000	.00	1 .0
243.700	.0195					.0195	4.76	4.55	1.98	4.55	.013	.00	.00	PIPE
1493.700	2389.190	4.549	2393.739	546.55	23.76	8.77	2402.51	.00	5.76	5.14	6.000	.000	.00	1 .0
381.560	.0195					.0196	7.48	4.55	1.98	4.55	.013	.00	.00	PIPE
1875.260	2396.630	4.535	2401.165	546.55	23.84	8.82	2409.99	.51	5.76	5.15	6.000	.000	.00	1 .0
52.180	.0194					.0197	1.03	5.04	1.99	4.57	.013	.00	.00	PIPE
1927.440	2397.640	4.529	2402.169	546.55	23.87	8.85	2411.02	.00	5.76	5.16	6.000	.000	.00	1 .0
235.720	.0195					.0199	4.69	4.53	2.00	4.55	.013	.00	.00	PIPE
2163.160	2402.240	4.501	2406.741	546.55	24.02	8.96	2415.70	.00	5.76	5.19	6.000	.000	.00	1 .0
263.920	.0195					.0204	5.39	4.50	2.02	4.55	.013	.00	.00	PIPE
2427.080	2407.390	4.427	2411.817	546.55	24.44	9.27	2421.09	.73	5.76	5.28	6.000	.000	.00	1 .0
72.920	.0194					.0210	1.53	5.15	2.09	4.56	.013	.00	.00	PIPE
2500.000	2408.808	4.394	2413.202	546.55	24.63	9.42	2422.62	.74	5.76	5.31	6.000	.000	.00	1 .0
117.940	.0255					.0202	2.38	5.14	2.12	4.09	.013	.00	.00	PIPE
2617.940	2411.810	4.593	2416.403	546.55	23.53	8.60	2425.00	.00	5.76	5.08	6.000	.000	.00	1 .0
9.130	.0252					.0190	.17	4.59	1.94	4.11	.013	.00	.00	PIPE
2627.070	2412.040	4.613	2416.653	546.55	23.43	8.52	2425.18	.00	5.76	5.06	6.000	.000	.00	1 .0
TRANS STR	.0250					.0218	.22	4.61	1.92		.013	.00	.00	PIPE

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2637.070	2412.290	3.646	2415.936	546.55	24.99	9.69	2425.63	.52	6.00	6.00	6.000	6.000	.00	0 .0
86.910	.0255					.0244	2.12	4.16	2.31	3.59	.013	.00	.00	BOX
2723.980	2414.510	3.669	2418.178	546.55	24.83	9.57	2427.75	.51	6.00	6.00	6.000	6.000	.00	0 .0
JUNCT STR	.0251					.0226	.15	4.18	2.28		.013	.00	.00	BOX
2730.750	2414.680	4.200	2418.880	607.59	24.11	9.03	2427.91	.48	6.00	6.00	6.000	6.000	.00	0 .0
24.420	.0254					.0209	.51	4.68	2.07	3.91	.013	.00	.00	BOX
2755.170	2415.300	4.234	2419.534	607.59	23.92	8.88	2428.42	.00	6.00	6.00	6.000	6.000	.00	0 .0
51.640	.0254					.0201	1.04	4.23	2.05	3.91	.013	.00	.00	BOX
2806.810	2416.610	4.321	2420.931	607.59	23.43	8.53	2429.46	.00	6.00	6.00	6.000	6.000	.00	0 .0
TRANS STR	.0750					.0193	1.16	4.32	1.99		.014	.00	.00	BOX
2866.810	2421.110	3.330	2424.440	607.59	20.29	6.39	2430.83	.00	5.17	13.99	5.000	4.000	1.50	0 .0

APPENDIX D.2

PROPOSED CALIMESA CHANNEL HYDRAULICS
WITHOUT FLOW SPLIT
WSPGW MODEL AND OUTPUT

APPENDIX D.2

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FILE: CCALTX3.WSW                           W S P G W  - EDIT LISTING - Version 14.08            Date: 4- 9-2018  Time:10:38:21
                                        WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                              PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                DROP

 CD      2    4      1              6.000
 CD      3    4      1              4.500
 CD      4    4      1              1.500
 CD      5    1      0      .000    5.000    4.000   1.500  1.500    .00
 CD      6    2      0      .000   17.500    9.000                   .00
 CD      8    4      1              6.500
 CD      9    3      0      .000    6.000    6.000    .000   .000    .00
 CD     10    4      1              6.250
 CD     11    3      0      .000    2.000    4.500    .000   .000    .00
 CD      1    5      0         .000
FILE:                                       W S P G W  - EDIT LISTING - Version 14.08            Date: 4- 9-2018  Time:10:38:21
                                       WATER SURFACE PROFILE - CROSS SECTION POINT LISTING                              PAGE    2
   CARD  SECT  NO OF    X(1) , Y(1)    X(2) , Y(2)    X(3) , Y(3)    X(4) , Y(4)    X(5) , Y(5)    X(6) , Y(6)    X(7) , Y(7)
   CODE   NO   POINTS   X(8) , Y(8)    X(9) , Y(9)   X(10) ,Y(10)   X(11) ,Y(11)    X(N) , Y(N)   X(N+1),Y(N+1)  X(35) ,Y(35)

   PTS     1     4        .000  17.500   17.500    .000   26.500    .000   44.000  17.500
                                                       W S P G W                                                  PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                               CALIMESA CHANNEL STAGE III
HEADING LINE NO 2 IS -
                               OUTFLOW AT EAST OF BAKER'S
HEADING LINE NO 3 IS -
                               RETARDING BASIN AT 3RD STREET-ALT12-WITHOUT FLOW SPLIT
                                                       W S P G W                                                  PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                     U/S DATA   STATION    INVERT  SECT                                W S ELEV
                                 457.710 2360.360    1                                  2372.770
 ELEMENT NO   2 IS A TRANSITION        *         *     *
                     U/S DATA   STATION    INVERT  SECT             N                                RADIUS   ANGLE
                                 462.710 2360.360    6             .030                                .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO   3 IS A  WALL  EXIT                       *
                     U/S DATA   STATION    INVERT  SECT
                                 462.710 2360.360    8
 ELEMENT NO   4 IS A REACH             *         *     *
                     U/S DATA   STATION    INVERT  SECT             N                                RADIUS    ANGLE     ANG PT  MAN H
                                 468.280 2360.490    8             .013                                .000     .000      .000     0
 ELEMENT NO   5 IS A REACH             *         *     *
                     U/S DATA   STATION    INVERT  SECT             N                                RADIUS    ANGLE     ANG PT  MAN H
                                 573.000 2362.950    8             .013                             200.000   30.000      .000     0
 ELEMENT NO   6 IS A REACH             *         *     *
                     U/S DATA   STATION    INVERT  SECT             N                                RADIUS    ANGLE     ANG PT  MAN H
                                 682.940 2365.540    8             .013                                .000     .000      .000     0
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ELEMENT NO   7 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                749.200 2367.630    8              .013                        180.002  -21.091      .000     1
ELEMENT NO   8 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                813.100 2369.640    8              .013                           .000     .000      .000     0
ELEMENT NO   9 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                923.060 2373.100    8              .013                        180.002   35.001      .000     0
ELEMENT NO  10 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                980.050 2374.900    8              .013                           .000     .000      .000     0
ELEMENT NO  11 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                994.580 2375.360    8              .013                           .000     .000      .125     0
ELEMENT NO  12 IS A JUNCTION       *         *     *     *                 *                   *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               1001.580 2376.080    2     3     0   .013    39.140      .000  2376.600      .000  69.000     .000
                                                                                             RADIUS    ANGLE
                                                                                               .000     .000
                                                           W S P G W                                                PAGE NO   3
                           WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  13 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1082.050 2378.780    2              .013                           .000     .000      .000     0
ELEMENT NO  14 IS A JUNCTION       *         *     *     *                 *                   *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               1084.550 2378.870    2     4     0   .013    15.220      .000  2381.080      .000 -90.000     .000
                                                                                             RADIUS    ANGLE
                                                                                               .000     .000
ELEMENT NO  15 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1156.670 2381.290    2              .013                           .000     .000      .000     0
ELEMENT NO  16 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1188.090 2382.350    2              .013                        180.005  -10.001      .000     0
ELEMENT NO  17 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1196.910 2382.650    2              .013                           .000     .000      .000     0
ELEMENT NO  18 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1228.320 2383.700    2              .013                        180.002    9.998      .000     0
ELEMENT NO  19 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1250.000 2384.430    2              .013                           .000     .000      .000     0
ELEMENT NO  20 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                               1493.700 2389.190    2              .013                           .000     .000      .000     0
ELEMENT NO  21 IS A REACH          *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
```

```
                    1875.260 2396.630    2              .013                           .000     .000     -.002     1
ELEMENT NO  22 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    1927.440 2397.640    2              .013                         180.004  -16.609      .000     1
ELEMENT NO  23 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2163.160 2402.240    2              .013                           .000     .000      .000     0
ELEMENT NO  24 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2427.080 2407.390    2              .013                           .000     .000     -.013     1
```



```
ELEMENT NO  25 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2500.000 2408.808    2              .013                         135.001   30.948      .000     0
ELEMENT NO  26 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2617.940 2411.810    2              .013                         135.001   50.055      .000     0
ELEMENT NO  27 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2627.070 2412.040    2              .013                           .000     .000      .000     0
ELEMENT NO  28 IS A TRANSITION    *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS   ANGLE
                    2637.070 2412.290    9              .013                           .000     .000
ELEMENT NO  29 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2755.170 2415.300    9              .013                        1088.231   -6.218      .000     0
ELEMENT NO  30 IS A REACH         *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS    ANGLE     ANG PT  MAN H
                    2806.810 2416.610    9              .013                           .000     .000      .000     0
ELEMENT NO  31 IS A TRANSITION    *         *     *
          U/S DATA   STATION    INVERT  SECT              N                           RADIUS   ANGLE
                    2866.810 2421.110    5              .014                           .000     .000
ELEMENT NO  32 IS A SYSTEM HEADWORKS              *                       *
          U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                    2866.810 2421.110    5                                     2424.440
```

APPENDIX D.2

```
FILE: CCALTX3.WSW                          W S P G W - CIVILDESIGN Version 14.08                                 PAGE    1
                               Program Package Serial Number: 7006
                                                   WATER SURFACE PROFILE LISTING                    Date: 4- 9-2018  Time:10:38:25
                            CALIMESA CHANNEL STAGE III
                              OUTFLOW AT EAST OF BAKER'S
                                RETARDING BASIN AT 3RD STREET-ALT12-WITHOUT FLOW SPLIT
************************************************************************************************************************ ********
         | Invert  |  Depth |  Water  |    Q    |  Vel      Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|     |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)     Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL |Prs/Pip
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-   -|
  L/Elem |Ch Slope |        |         |         |          SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |       |        |        |       |       |     |
  457.710  2360.360  12.410  2372.770    661.95    2.49     .10  2372.87    .00    4.62    33.82                 1       0   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
TRANS STR  .0000                                          .0016       .01  12.41    .16              .030                  IR-OPEN
         |         |        |         |         |               |         |       |        |        |       |       |     |
  462.710  2360.360  12.184  2372.544    661.95    6.04     .57  2373.11    .00    5.52     9.00  17.500   9.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
 WALL  EXIT
         |         |        |         |         |               |         |       |        |        |       |       |     |
  462.710  2360.360  12.184  2372.544    661.95   19.95    6.18  2378.72    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    5.570   .0233                                         .0159       .09  12.18     .00    4.51    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  468.280  2360.490  12.143  2372.633    661.95   19.95    6.18  2378.81    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  104.720   .0235                                         .0159      1.67    .00     .00    4.49    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  573.000  2362.950  12.066  2375.016    661.95   19.95    6.18  2381.20    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  109.940   .0236                                         .0159      1.75  12.07     .00    4.49    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  682.940  2365.540  11.228  2376.769    661.95   19.95    6.18  2382.95    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   66.260   .0315                                         .0159      1.06    .00     .00    4.05    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  749.200  2367.630  11.102  2378.732    661.95   19.95    6.18  2384.91    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
   63.900   .0315                                         .0159      1.02  11.10     .00    4.05    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  813.100  2369.640  10.111  2379.750    661.95   19.95    6.18  2385.93    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
  109.960   .0315                                         .0159      1.75    .00     .00    4.05    .013     .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |     |
  923.060  2373.100   9.174  2382.274    661.95   19.95    6.18  2388.45    .00    6.23      .00   6.500    .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    |-
    6.545   .0316                                         .0159       .10   9.17     .00    4.05    .013     .00   .00  PIPE
```

Program Package Serial Number: 7006

WATER SURFACE PROFILE LISTING Date: 4- 9-2018 Time:10:38:25

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITHOUT FLOW SPLIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
929.605	2373.307	9.068	2382.375	661.95	19.95	6.18	2388.55	.00	6.23	.00	6.500	.000	.00	1 .0
HYDRAULIC JUMP														
929.605	2373.307	4.505	2377.812	661.95	26.97	11.30	2389.11	.00	6.23	6.00	6.500	.000	.00	1 .0
50.445	.0316					.0227	1.14	4.50	2.35	4.05	.013	.00	.00	PIPE
980.050	2374.900	4.608	2379.508	661.95	26.31	10.75	2390.26	.00	6.23	5.91	6.500	.000	.00	1 .0
14.530	.0317					.0218	.32	4.61	2.25	4.04	.013	.00	.00	PIPE
994.580	2375.360	4.644	2380.004	661.95	26.09	10.57	2390.58	.00	6.23	5.87	6.500	.000	.00	1 .0
JUNCT STR	.1029					.0235	.16	4.64	2.21		.013	.00	.00	PIPE
1001.580	2376.080	4.546	2380.625	622.81	27.10	11.40	2392.03	.00	5.86	5.14	6.000	.000	.00	1 .0
80.470	.0336					.0243	1.95	4.55	2.26	4.07	.013	.00	.00	PIPE
1082.050	2378.780	4.749	2383.529	622.81	25.95	10.45	2393.98	.00	5.86	4.87	6.000	.000	.00	1 .0
JUNCT STR	.0360					.0241	.06	4.75	2.06		.013	.00	.00	PIPE
1084.550	2378.870	4.469	2383.339	607.59	26.90	11.24	2394.58	.00	5.84	5.23	6.000	.000	.00	1 .0
72.120	.0336					.0241	1.74	4.47	2.28	4.00	.013	.00	.00	PIPE
1156.670	2381.290	4.647	2385.937	607.59	25.86	10.38	2396.32	.58	5.84	5.01	6.000	.000	.00	1 .0
31.420	.0337					.0225	.71	5.23	2.10	3.99	.013	.00	.00	PIPE
1188.090	2382.350	4.757	2387.107	607.59	25.27	9.92	2397.03	.00	5.84	4.86	6.000	.000	.00	1 .0
8.820	.0340					.0218	.19	4.76	2.00	3.98	.013	.00	.00	PIPE

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITHOUT FLOW SPLIT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth	Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1196.910	2382.650	4.793	2387.443	607.59	25.09	9.78	2397.22	.52	5.84	4.81	6.000	.000	.00	1	.0
31.410	.0334					.0210	.66	5.32	1.97	4.00	.013	.00	.00	PIPE	
1228.320	2383.700	4.940	2388.640	607.59	24.40	9.24	2397.88	.00	5.84	4.58	6.000	.000	.00	1	.0
21.680	.0337					.0200	.43	4.94	1.84	3.99	.013	.00	.00	PIPE	
1250.000	2384.430	5.075	2389.505	607.59	23.82	8.81	2398.31	.00	5.84	4.33	6.000	.000	.00	1	.0
243.700	.0195					.0195	4.76	5.08	1.73	5.07	.013	.00	.00	PIPE	
1493.700	2389.190	5.076	2394.266	607.59	23.81	8.81	2403.07	.00	5.84	4.33	6.000	.000	.00	1	.0
381.560	.0195					.0196	7.46	5.08	1.73	5.08	.013	.00	.00	PIPE	
1875.260	2396.630	5.066	2401.696	607.59	23.86	8.84	2410.53	.43	5.84	4.35	6.000	.000	.00	1	.0
52.180	.0194					.0196	1.02	5.49	1.74	5.10	.013	.00	.00	PIPE	
1927.440	2397.640	5.060	2402.700	607.59	23.88	8.86	2411.56	.00	5.84	4.36	6.000	.000	.00	1	.0
235.720	.0195					.0197	4.64	5.06	1.74	5.08	.013	.00	.00	PIPE	
2163.160	2402.240	5.041	2407.281	607.59	23.96	8.91	2416.19	.00	5.84	4.40	6.000	.000	.00	1	.0
263.920	.0195					.0199	5.25	5.04	1.76	5.08	.013	.00	.00	PIPE	
2427.080	2407.390	4.995	2412.385	607.59	24.15	9.06	2421.44	.60	5.84	4.48	6.000	.000	.00	1	.0
72.920	.0194					.0201	1.47	5.60	1.80	5.09	.013	.00	.00	PIPE	
2500.000	2408.808	4.974	2413.782	607.59	24.24	9.13	2422.91	.61	5.84	4.52	6.000	.000	.00	1	.0
47.153	.0255					.0198	.93	5.59	1.81	4.45	.013	.00	.00	PIPE	

WATER SURFACE PROFILE LISTING Date: 4- 9-2018 Time:10:38:25

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALT12-WITHOUT FLOW SPLIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2547.153	2410.008	5.101	2415.109	607.59	23.72	8.73	2423.84	.55	5.84	4.28	6.000	.000	.00	1 .0
70.787	.0255					.0187	1.33	5.66	1.71	4.45	.013	.00	.00	PIPE
2617.940	2411.810	5.419	2417.229	607.59	22.61	7.94	2425.17	.00	5.84	3.55	6.000	.000	.00	1 .0
9.130	.0252					.0180	.16	5.42	1.45	4.47	.013	.00	.00	PIPE
2627.070	2412.040	5.483	2417.523	607.59	22.43	7.81	2425.33	.00	5.84	3.37	6.000	.000	.00	1 .0
TRANS STR	.0250					.0202	.20	5.48	1.39		.013	.00	.00	PIPE
2637.070	2412.290	4.098	2416.388	607.59	24.71	9.48	2425.87	.10	6.00	6.00	6.000	6.000	.00	0 .0
118.100	.0255					.0216	2.55	4.20	2.15	3.90	.013	.00	.00	BOX
2755.170	2415.300	4.234	2419.534	607.59	23.92	8.88	2428.42	.00	6.00	6.00	6.000	6.000	.00	0 .0
51.640	.0254					.0201	1.04	4.23	2.05	3.91	.013	.00	.00	BOX
2806.810	2416.610	4.321	2420.931	607.59	23.43	8.53	2429.46	.00	6.00	6.00	6.000	6.000	.00	0 .0
TRANS STR	.0750					.0193	1.16	4.32	1.99		.014	.00	.00	BOX
2866.810	2421.110	3.330	2424.440	607.59	20.29	6.39	2430.83	.00	5.17	13.99	5.000	4.000	1.50	0 .0

APPENDIX D.3

PROPOSED LINE A HYDRAULICS

WSPGW MODEL AND OUTPUT

APPENDIX D.3

```
FILE: CCLAF.WSW                            W S P G W  - EDIT LISTING - Version 14.08             Date: 5- 4-2018  Time: 2:20:34
                                       WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                                PAGE    1
 CARD   SECT   CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE    NO    TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                DROP

 CD      1     4      1              4.500
 CD      2     3      0      .000    4.500    4.500    .000   .000    .00
 CD      3     4      1              1.500
 CD      4     4      1              2.000
 CD      5     3      0      .000    6.000    5.750    .000   .000    .00
 CD      6     1      0      .000    3.000    3.000   3.000  3.000    .00
                                                             W S P G W                                                   PAGE NO   1
                                 WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                                   CALIMESA CHANNEL STAGE III
HEADING LINE NO 2 IS -
                                   OUTFLOW AT EAST OF BAKER'S
HEADING LINE NO 3 IS -
                                   RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT-LINE A
                                                             W S P G W                                                   PAGE NO   2
                                 WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO    1 IS A SYSTEM OUTLET      *         *     *
                    U/S DATA   STATION    INVERT  SECT                                      W S ELEV
                               1002.320 2376.600    1                                        2384.420
 ELEMENT NO    2 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                            RADIUS    ANGLE     ANG PT  MAN H
                               1137.530 2378.620    1               .013                            .000     .000      .000     0
 ELEMENT NO    3 IS A TRANSITION         *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                            RADIUS   ANGLE
                               1142.200 2378.690    2               .013                            .000     .000
 ELEMENT NO    4 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                            RADIUS    ANGLE     ANG PT  MAN H
                               1145.770 2378.750    2               .013                          22.500   -9.091      .000     0
 ELEMENT NO    5 IS A JUNCTION           *         *     *     *                  *                   *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N       Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               1147.270 2378.775    2     3     0   .013     5.000       .000  2380.260      .000 -79.000      .000
                                                                                              RADIUS    ANGLE
                                                                                              22.498   -3.820
 ELEMENT NO    6 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                            RADIUS    ANGLE     ANG PT  MAN H
                               1151.680 2378.848    2               .013                          22.500  -11.230      .000     0
 ELEMENT NO    7 IS A JUNCTION           *         *     *     *                  *                   *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N       Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               1153.180 2378.940    2     3     0   .013     6.000       .000  2380.390      .000  90.000      .000
                                                                                              RADIUS    ANGLE
                                                                                              22.498   -3.820
 ELEMENT NO    8 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                            RADIUS    ANGLE     ANG PT  MAN H
                               1163.290 2379.630    2               .013                          22.500  -25.745      .000     0
 ELEMENT NO    9 IS A JUNCTION           *         *     *     *                  *                   *               *
```

```
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                           1165.290 2379.770    2     4     0   .013    26.000      .000  2380.950      .000  56.300     .000
                                                                                              RADIUS    ANGLE
                                                                                              22.500  -5.093
                                                         W S P G W                                                PAGE NO   3
                              WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  10 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT               N                                RADIUS    ANGLE     ANG PT  MAN H
                           1170.620 2380.130    2              .013                              22.499  -13.573      .000     0
ELEMENT NO  11 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT               N                                RADIUS    ANGLE     ANG PT  MAN H
                           1182.720 2380.960    2              .013                                .000     .000      .000     0
ELEMENT NO  12 IS A TRANSITION       *         *     *
                U/S DATA   STATION    INVERT  SECT               N                                RADIUS   ANGLE
                           1192.720 2381.646    5              .013                                .000     .000
ELEMENT NO  13 IS A SYSTEM HEADWORKS                 *                       *
                U/S DATA   STATION    INVERT  SECT                                          W S ELEV
                           1192.720 2381.640    5                                                   2381.640
```

APPENDIX D.3

Program Package Serial Number: 7006

WATER SURFACE PROFILE LISTING Date: 5- 4-2018 Time: 2:20:40

CALIMESA CHANNEL STAGE III

OUTFLOW AT EAST OF BAKER'S

RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT-LINE A

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1002.320	2376.600	7.820	2384.420	131.00	8.24	1.05	2385.47	.00	3.37	.00	4.500	.000	.00	1 .0
135.210	.0149					.0044	.60	7.82	.00	2.37	.013	.00	.00	PIPE
1137.530	2378.620	6.400	2385.020	131.00	8.24	1.05	2386.07	.00	3.37	.00	4.500	.000	.00	1 .0
TRANS STR	.0150					.0027	.01	6.40	.00		.013	.00	.00	PIPE
1142.200	2378.690	6.791	2385.481	131.00	6.47	.65	2386.13	.00	2.97	4.50	4.500	4.500	.00	0 .0
3.570	.0168					.0027	.01	.00	.54	1.92	.013	.00	.00	BOX
1145.770	2378.750	6.782	2385.532	131.00	6.47	.65	2386.18	.00	2.97	4.50	4.500	4.500	.00	0 .0
JUNCT STR	.0166					.0025	.00	.00	.54		.013	.00	.00	BOX
1147.270	2378.775	6.854	2385.629	126.00	6.22	.60	2386.23	.00	2.90	4.50	4.500	4.500	.00	0 .0
4.410	.0166					.0025	.01	.00	.52	1.88	.013	.00	.00	BOX
1151.680	2378.848	6.835	2385.683	126.00	6.22	.60	2386.28	.00	2.90	4.50	4.500	4.500	.00	0 .0
JUNCT STR	.0614					.0023	.00	.00	.52		.013	.00	.00	BOX
1153.180	2378.940	6.858	2385.798	120.00	5.93	.55	2386.34	.00	2.81	4.50	4.500	4.500	.00	0 .0
10.110	.0682					.0023	.02	.00	.49	1.09	.013	.00	.00	BOX
1163.290	2379.630	6.250	2385.879	120.00	5.93	.55	2386.42	.00	2.81	4.50	4.500	4.500	.00	0 .0
JUNCT STR	.0701					.0014	.00	.00	.49		.013	.00	.00	BOX
1165.290	2379.770	6.351	2386.121	94.00	4.64	.33	2386.46	.00	2.38	4.50	4.500	4.500	.00	0 .0
5.330	.0675					.0014	.01	.00	.39	.93	.013	.00	.00	BOX

FILE: CCLAF.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 2

Program Package Serial Number: 7006

WATER SURFACE PROFILE LISTING Date: 5- 4-2018 Time: 2:20:40

CALIMESA CHANNEL STAGE III

OUTFLOW AT EAST OF BAKER'S

RETARDING BASIN AT 3RD STREET-ALT12-WITH FLOW SPLIT-LINE A

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1170.620	2380.130	6.025	2386.155	94.00	4.64	.33	2386.49	.00	2.38	4.50	4.500	4.500	.00	0 .0
12.100	.0686					.0014	.02	6.02	.39	.92	.013	.00	.00	BOX
1182.720	2380.960	5.212	2386.172	94.00	4.64	.33	2386.51	.00	2.38	4.50	4.500	4.500	.00	0 .0
TRANS STR	.0686					.0014	.01	5.21	.39		.013	.00	.00	BOX
1192.720	2381.646	4.697	2386.343	94.00	3.48	.19	2386.53	.00	2.02	5.75	6.000	5.750	.00	0 .0

APPENDIX D.4

PROPOSED LINE B HYDRAULICS

WSPGW MODEL AND OUTPUT

APPENDIX D.4

```
FILE: CCLB.WSW                           W S P G W  - EDIT LISTING - Version 14.08          Date: 3-29-2018  Time: 8:29:37
                                     WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                           PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE     ZL     ZR    INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH                 DROP

 CD      1    2      0      .000     9.000    6.000                   .00
 CD      2    2      0      .000    18.000    6.000                   .00
 CD      3    4      1               3.000
 CD      4    3      0      .000     3.000    4.500   .000   .000     .00
 CD      5    3      0      .000     6.050    6.000   .000   .000     .00
 CD      6    3      0      .000     6.060    6.000   .000   .000     .00
                                                          W S P G W                                                PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              CALIMESA CHANNEL STAGE III
HEADING LINE NO 2 IS -
                              OUTFLOW AT EAST OF BAKER'S
HEADING LINE NO 3 IS -
                              RETARDING BASIN AT 3RD STREET-ALTERNATIVE 12-LINE B
                                                          W S P G W                                                PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET      *         *     *
                    U/S DATA   STATION    INVERT  SECT                                      W S ELEV
                                444.130 2409.050    1                                        2409.050
 ELEMENT NO   2 IS A TRANSITION         *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS   ANGLE
                                469.130 2409.170    2              .014                           .000     .000
 ELEMENT NO   3 IS A  WALL  EXIT                        *
                    U/S DATA   STATION    INVERT  SECT
                                469.130 2409.170    3
 ELEMENT NO   4 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                482.390 2409.310    3              .013                           .000     .000      .000     0
 ELEMENT NO   5 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                539.010 2409.880    3              .013                         90.001   36.045      .000     0
 ELEMENT NO   6 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                985.420 2414.440    3              .013                           .000     .000      .000     1
 ELEMENT NO   7 IS A TRANSITION         *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS   ANGLE
                                991.420 2414.501    4              .013                           .000     .000
 ELEMENT NO   8 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                            RADIUS    ANGLE     ANG PT  MAN H
                                995.420 2414.540    4              .013                           .000     .000      .000     0
 ELEMENT NO   9 IS A  WALL  ENTRANCE                    *
                    U/S DATA   STATION    INVERT  SECT             FP
                                995.420 2414.540    5              .200
WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS
 ELEMENT NO  10 IS A SYSTEM HEADWORKS                   *                       *
```

U/S DATA	STATION	INVERT	SECT	W S ELEV
	995.420	2414.540	6	.000

APPENDIX D.4

FILE: CCLB.WSW   W S P G W - CIVILDESIGN Version 14.08   PAGE 1

Program Package Serial Number: 7006

WATER SURFACE PROFILE LISTING   Date: 3-29-2018 Time: 8:29:41

CALIMESA CHANNEL STAGE III
OUTFLOW AT EAST OF BAKER'S
RETARDING BASIN AT 3RD STREET-ALTERNATIVE 12-LINE B

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
444.130	2409.050	.938	2409.988	61.00	10.84	1.82	2411.81	.00	1.48	6.00	9.000	6.000	.00	0 .0
TRANS STR	.0048					.0216	.54	.94	1.97		.014	.00	.00	RECTANG
469.130	2409.170	.797	2409.967	61.00	12.76	2.53	2412.49	.00	1.48	6.00	18.000	6.000	.00	0 .0
WALL EXIT														
469.130	2409.170	2.236	2411.406	61.00	10.80	1.81	2413.22	.00	2.52	2.61	3.000	.000	.00	1 .0
13.260	.0106					.0102	.13	2.24	1.29	2.20	.013	.00	.00	PIPE
482.390	2409.310	2.244	2411.554	61.00	10.76	1.80	2413.35	.10	2.52	2.60	3.000	.000	.00	1 .0
56.620	.0101					.0102	.58	2.35	1.28	2.25	.013	.00	.00	PIPE
539.010	2409.880	2.235	2412.115	61.00	10.80	1.81	2413.93	.00	2.52	2.61	3.000	.000	.00	1 .0
265.528	.0102					.0102	2.71	2.24	1.29	2.24	.013	.00	.00	PIPE
804.538	2412.592	2.235	2414.827	61.00	10.80	1.81	2416.64	.00	2.52	2.61	3.000	.000	.00	1 .0
122.308	.0102					.0100	1.22	2.24	1.29	2.24	.013	.00	.00	PIPE
926.847	2413.842	2.277	2416.119	61.00	10.59	1.74	2417.86	.00	2.52	2.57	3.000	.000	.00	1 .0
49.569	.0102					.0093	.46	2.28	1.25	2.24	.013	.00	.00	PIPE
976.415	2414.348	2.390	2416.738	61.00	10.10	1.58	2418.32	.00	2.52	2.41	3.000	.000	.00	1 .0
9.005	.0102					.0084	.08	2.39	1.13	2.24	.013	.00	.00	PIPE
985.420	2414.440	2.519	2416.959	61.00	9.63	1.44	2418.40	.00	2.52	2.20	3.000	.000	.00	1 .0
TRANS STR	.0102					.0018	.01	2.52	1.00		.013	.00	.00	PIPE

```
                               Program Package Serial Number: 7006
                                                   WATER SURFACE PROFILE LISTING                     Date: 3-29-2018  Time: 8:29:41
                         CALIMESA CHANNEL STAGE III
                           OUTFLOW AT EAST OF BAKER'S
                             RETARDING BASIN AT 3RD STREET-ALTERNATIVE 12-LINE B
************************************************************************************************************************************ ********
         | Invert  |  Depth |  Water   |    Q     |  Vel     Vel   |  Energy  | Super  |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev    |  (CFS)   | (FPS)    Head  | Grd.El.| Elev   | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-       -|-       -|-      -|-      -|-    -|
 L/Elem  |Ch Slope |        |          |          |         SF Ave|    HF    |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
         |         |        |          |          |                |          |        |        |        |       |       |      |
  991.420  2414.501    3.765  2418.266     61.00    4.52      .32  2418.58      .00    1.79     4.50   3.000    4.500   .00   0   .0
        -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-       -|-       -|-      -|-      -|-     |-
   4.000    .0098                                          .0018      .01     3.76     .46     1.35    .013      .00   .00  BOX
         |         |        |          |          |                |          |        |        |        |       |       |      |
  995.420  2414.540    3.733  2418.273     61.00    4.52      .32  2418.59      .00    1.79     4.50   3.000    4.500   .00   0   .0
        -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-       -|-       -|-      -|-      -|-     |-
 WALL  ENTRANCE
         |         |        |          |          |                |          |        |        |        |       |       |      |
  995.420  2414.540    3.994  2418.533     61.00    2.55      .10  2418.63      .00    1.48     6.00   6.050    6.000   .00   0   .0
        -|-       -|-      -|-        -|-        -|-      -|-     -|-       -|-     -|-       -|-       -|-      -|-      -|-     |-
```

APPENDIX E

HYDROLOGY MANUAL
SUPPORTING INFORMATION

S:\CADD\133-02 Calimesa Creek\Hydrology\Hydrology Manual Plate C-106.dwg

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

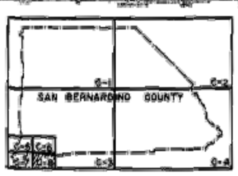
RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR YUCAIPA

PLATE C-1.06



LEGEND

———	SOIL GROUP BOUNDARY
A	SOIL GROUP DESIGNATION
— — —	BOUNDARY OF INDICATED SOURCE

SCALE 1:48,000

SCALE REDUCED BY 1/2

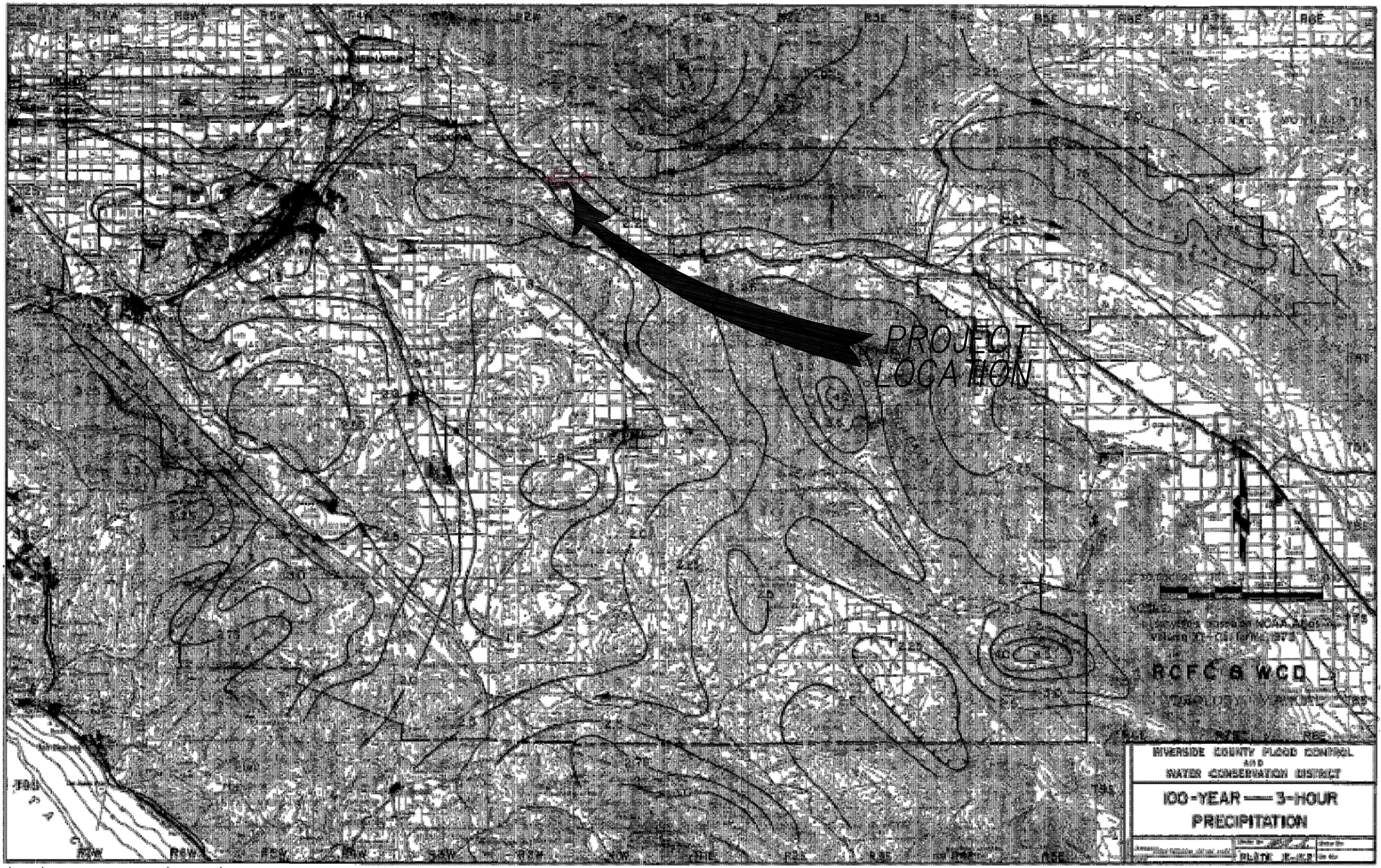
SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP FOR SOUTHWEST-D AREA

FIGURE C-16

S:\CADD\133-02 Calimesa Creek\Hydrology\Hydrology Manual Plate C-16.dwg



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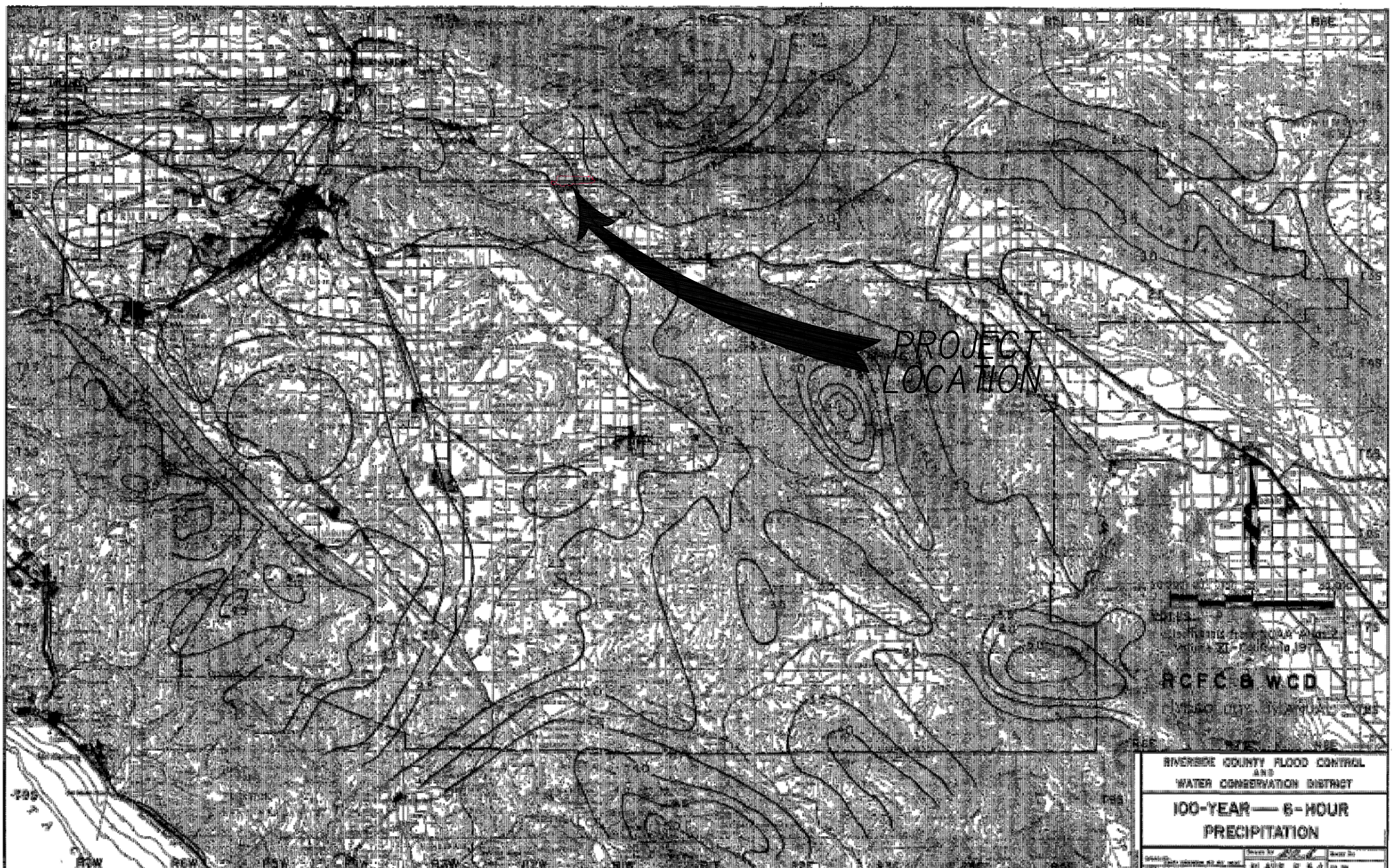

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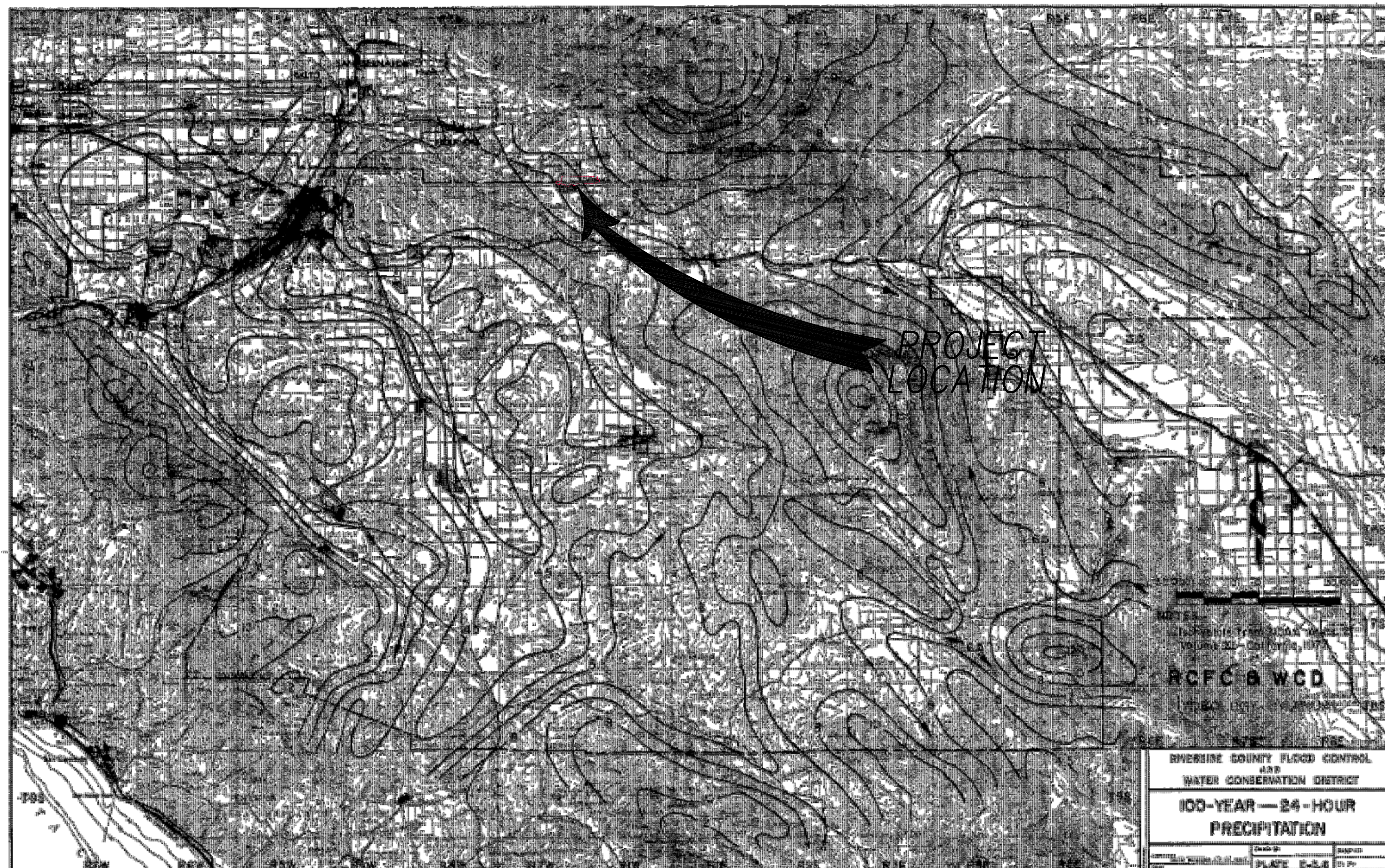

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RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	Soil Group B	Soil Group C	Soil Group D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREAS

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

RCFC & WCD
HYDROLOGY MANUAL

IMPERVIOUS COVER FOR DEVELOPED AREAS

Appendix G – Noise Report

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Calimesa Creek Detention Basin

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	4.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - approx 4 acres

Construction Phase - 120 days construction

Grading - 31000 cy export

Off-road Equipment - 1 excavator, 1 dozer, 1 scraper, 1 loader/backhoe, 1 water truck

Trips and VMT - 15 mile haul distance for earthworks export

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	8.00	120.00
tblConstructionPhase	PhaseEndDate	7/15/2022	12/20/2022
tblGrading	AcresOfGrading	120.00	8.00

tblGrading	MaterialExported	0.00	31,000.00
tblLandUse	LotAcreage	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblTripsAndVMT	HaulingTripLength	20.00	15.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1428	1.5715	1.0783	3.2700e-003	0.4022	0.0600	0.4622	0.2088	0.0552	0.2641	0.0000	298.2463	298.2463	0.0701	0.0143	304.2653
Maximum	**0.1428**	**1.5715**	**1.0783**	**3.2700e-003**	**0.4022**	**0.0600**	**0.4622**	**0.2088**	**0.0552**	**0.2641**	**0.0000**	**298.2463**	**298.2463**	**0.0701**	**0.0143**	**304.2653**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1428	0.9855	1.0783	3.2700e-003	0.1782	0.0600	0.2381	0.0872	0.0552	0.1425	0.0000	298.2460	298.2460	0.0701	0.0143	304.2651
Maximum	**0.1428**	**0.9855**	**1.0783**	**3.2700e-003**	**0.1782**	**0.0600**	**0.2381**	**0.0872**	**0.0552**	**0.1425**	**0.0000**	**298.2460**	**298.2460**	**0.0701**	**0.0143**	**304.2651**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**37.29**	**0.00**	**0.00**	**55.71**	**0.00**	**48.48**	**58.23**	**0.00**	**46.05**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**6-1-2022**	**8-31-2022**	0.5774	0.3786
2	**9-1-2022**	**9-30-2022**	0.3039	0.1993
		Highest	0.5774	0.3786

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	7/6/2022	12/20/2022	5	120	

Acres of Grading (Site Preparation Phase): 0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Grading Phase): 8

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Scrapers	1	6.00	367	0.48
Grading	Off-Highway Trucks	1	6.00	402	0.38
Grading	Excavators	1	8.00	158	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	6	15.00	0.00	3,875.00	14.70	6.90	15.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3673	0.0000	0.3673	0.1993	0.0000	0.1993	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1332	1.3208	0.9848	2.2900e-003		0.0580	0.0580		0.0534	0.0534	0.0000	201.4254	201.4254	0.0652	0.0000	203.0541
Total	**0.1332**	**1.3208**	**0.9848**	**2.2900e-003**	**0.3673**	**0.0580**	**0.4253**	**0.1993**	**0.0534**	**0.2527**	**0.0000**	**201.4254**	**201.4254**	**0.0652**	**0.0000**	**203.0541**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.5800e-003	0.2483	0.0616	8.9000e-004	0.0250	1.9000e-003	0.0269	6.8700e-003	1.8200e-003	8.6900e-003	0.0000	88.8370	88.8370	4.7300e-003	0.0141	93.1577
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0200e-003	2.4400e-003	0.0319	9.0000e-005	9.8700e-003	6.0000e-005	9.9300e-003	2.6200e-003	6.0000e-005	2.6800e-003	0.0000	7.9839	7.9839	2.2000e-004	2.2000e-004	8.0536
Total	**9.6000e-003**	**0.2508**	**0.0935**	**9.8000e-004**	**0.0349**	**1.9600e-003**	**0.0369**	**9.4900e-003**	**1.8800e-003**	**0.0114**	**0.0000**	**96.8208**	**96.8208**	**4.9500e-003**	**0.0143**	**101.2112**

3.2 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1433	0.0000	0.1433	0.0777	0.0000	0.0777	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1332	0.7348	0.9848	2.2900e-003		0.0580	0.0580		0.0534	0.0534	0.0000	201.4252	201.4252	0.0651	0.0000	203.0538
Total	**0.1332**	**0.7348**	**0.9848**	**2.2900e-003**	**0.1433**	**0.0580**	**0.2012**	**0.0777**	**0.0534**	**0.1311**	**0.0000**	**201.4252**	**201.4252**	**0.0651**	**0.0000**	**203.0538**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.5800e-003	0.2483	0.0616	8.9000e-004	0.0250	1.9000e-003	0.0269	6.8700e-003	1.8200e-003	8.6900e-003	0.0000	88.8370	88.8370	4.7300e-003	0.0141	93.1577
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0200e-003	2.4400e-003	0.0319	9.0000e-005	9.8700e-003	6.0000e-005	9.9300e-003	2.6200e-003	6.0000e-005	2.6800e-003	0.0000	7.9839	7.9839	2.2000e-004	2.2000e-004	8.0536
Total	**9.6000e-003**	**0.2508**	**0.0935**	**9.8000e-004**	**0.0349**	**1.9600e-003**	**0.0369**	**9.4900e-003**	**1.8800e-003**	**0.0114**	**0.0000**	**96.8208**	**96.8208**	**4.9500e-004**	**0.0143**	**101.2112**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calimesa Creek Detention Basin

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	4.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - approx 4 acres

Construction Phase - 120 days construction

Off-road Equipment - 1 excavator, 1 dozer, 1 scraper, 1 loader/backhoe, 1 water truck

Trips and VMT - 15 mile haul distance for earthworks export

Grading - 31000 cy export

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	8.00	120.00
tblGrading	AcresOfGrading	150.00	8.00
tblGrading	MaterialExported	0.00	31,000.00

tblLandUse	LotAcreage	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	15.00
tblTripsAndVMT	WorkerTripNumber	13.00	15.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3779	25.9335	17.9652	0.0545	6.7135	0.9974	7.7109	3.4829	0.9188	4.4017	0.0000	5,475.3976	5,475.3976	1.2845	0.2627	5,585.7923
Maximum	**2.3779**	**25.9335**	**17.9652**	**0.0545**	**6.7135**	**0.9974**	**7.7109**	**3.4829**	**0.9188**	**4.4017**	**0.0000**	**5,475.3976**	**5,475.3976**	**1.2845**	**0.2627**	**5,585.7923**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	2.3779	25.9335	17.9652	0.0545	2.9790	0.9974	3.9765	1.4563	0.9188	2.3751	0.0000	5,475.3976	5,475.3976	1.2845	0.2627	5,585.7923
Maximum	**2.3779**	**25.9335**	**17.9652**	**0.0545**	**2.9790**	**0.9974**	**3.9765**	**1.4563**	**0.9188**	**2.3751**	**0.0000**	**5,475.3976**	**5,475.3976**	**1.2845**	**0.2627**	**5,585.7923**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**55.63**	**0.00**	**48.43**	**58.19**	**0.00**	**46.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	7/6/2022	12/20/2022	5	120	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	1	8.00	158	0.38
Grading	Off-Highway Trucks	1	6.00	402	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	6.00	367	0.48
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	5	15.00	0.00	3,875.00	14.70	6.90	15.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.1220	0.0000	6.1220	3.3223	0.0000	3.3223			0.0000			0.0000
Off-Road	2.2150	21.9642	16.3760	0.0381		0.9647	0.9647		0.8875	0.8875		3,690.249 0	3,690.249 0	1.1935		3,720.086 5
Total	**2.2150**	**21.9642**	**16.3760**	**0.0381**	**6.1220**	**0.9647**	**7.0867**	**3.3223**	**0.8875**	**4.2098**		**3,690.249 0**	**3,690.249 0**	**1.1935**		**3,720.086 5**

3.2 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1113	3.9330	1.0175	0.0149	0.4238	0.0317	0.4555	0.1162	0.0303	0.1465		1,631.7687	1,631.7687	0.0870	0.2590	1,711.1322
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0516	0.0363	0.5718	1.5200e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		153.3798	153.3798	4.0100e-003	3.6700e-003	154.5736
Total	**0.1629**	**3.9693**	**1.5893**	**0.0164**	**0.5915**	**0.0327**	**0.6242**	**0.1607**	**0.0313**	**0.1919**		**1,785.1486**	**1,785.1486**	**0.0910**	**0.2627**	**1,865.7058**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.3876	0.0000	2.3876	1.2957	0.0000	1.2957			0.0000			0.0000
Off-Road	2.2150	21.9642	16.3760	0.0381		0.9647	0.9647		0.8875	0.8875	0.0000	3,690.2490	3,690.2490	1.1935		3,720.0865
Total	**2.2150**	**21.9642**	**16.3760**	**0.0381**	**2.3876**	**0.9647**	**3.3523**	**1.2957**	**0.8875**	**2.1832**	**0.0000**	**3,690.2490**	**3,690.2490**	**1.1935**		**3,720.0865**

3.2 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1113	3.9330	1.0175	0.0149	0.4238	0.0317	0.4555	0.1162	0.0303	0.1465		1,631.768 7	1,631.768 7	0.0870	0.2590	1,711.132 2
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0516	0.0363	0.5718	1.5200e-003	0.1677	1.0000e-003	0.1687	0.0445	9.2000e-004	0.0454		153.3798	153.3798	4.0100e-003	3.6700e-003	154.5736
Total	**0.1629**	**3.9693**	**1.5893**	**0.0164**	**0.5915**	**0.0327**	**0.6242**	**0.1607**	**0.0313**	**0.1919**		**1,785.148 6**	**1,785.148 6**	**0.0910**	**0.2627**	**1,865.705 8**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543139	0.060749	0.184760	0.130258	0.023830	0.006353	0.011718	0.009137	0.000812	0.000509	0.024193	0.000750	0.003791

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calimesa Creek Diversion Structures

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 10 **Operational Year** 2022

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 390.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - one acre

Construction Phase -

Off-road Equipment - 1 loader/backhoe, 1 excavator, 1 rubber tired loader

Construction Off-road Equipment Mitigation -

Off-road Equipment - 1 loader/backhoe, 1 mixer, 1 pump, 1 excavator

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	12/6/2022	10/11/2022
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Pumps

tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOnRoadDust	PhaseName	Tie Ins	Diversion Structures
tblTripsAndVMT	PhaseName	Tie Ins	Diversion Structures
tblTripsAndVMT	WorkerTripNumber	13.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0172	0.1521	0.2071	3.4000e-004	0.0000	7.8200e-003	7.8200e-003	0.0000	7.5000e-003	7.5000e-003	0.0000	28.7848	28.7848	5.6200e-003	0.0000	28.9253
Maximum	**0.0172**	**0.1521**	**0.2071**	**3.4000e-004**	**0.0000**	**7.8200e-003**	**7.8200e-003**	**0.0000**	**7.5000e-003**	**7.5000e-003**	**0.0000**	**28.7848**	**28.7848**	**5.6200e-003**	**0.0000**	**28.9253**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0172	0.0503	0.2071	3.4000e-004	0.0000	7.8200e-003	7.8200e-003	0.0000	7.5000e-003	7.5000e-003	0.0000	28.7848	28.7848	5.6200e-003	0.0000	28.9252
Maximum	**0.0172**	**0.0503**	**0.2071**	**3.4000e-004**	**0.0000**	**7.8200e-003**	**7.8200e-003**	**0.0000**	**7.5000e-003**	**7.5000e-003**	**0.0000**	**28.7848**	**28.7848**	**5.6200e-003**	**0.0000**	**28.9252**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**66.96**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2022	9-30-2022	0.1472	0.0587
		Highest	0.1472	0.0587

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Diversion Structures	Trenching	7/20/2022	10/11/2022	5	60	

Acres of Grading (Site Preparation Phase): 0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Diversion Structures	Cement and Mortar Mixers	1	6.00	9	0.56
Diversion Structures	Pumps	1	6.00	84	0.74
Diversion Structures	Excavators	1	4.00	158	0.38
Diversion Structures	Tractors/Loaders/Backhoes	1	8.00	97	0.37

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Diversion Structures	5	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Diversion Structures - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0172	0.1521	0.2071	3.4000e-004		7.8200e-003	7.8200e-003		7.5000e-003	7.5000e-003	0.0000	28.7848	28.7848	5.6200e-003	0.0000	28.9253
Total	**0.0172**	**0.1521**	**0.2071**	**3.4000e-004**		**7.8200e-003**	**7.8200e-003**		**7.5000e-003**	**7.5000e-003**	**0.0000**	**28.7848**	**28.7848**	**5.6200e-003**	**0.0000**	**28.9253**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Diversion Structures - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0172	0.0503	0.2071	3.4000e-004		7.8200e-003	7.8200e-003		7.5000e-003	7.5000e-003	0.0000	28.7848	28.7848	5.6200e-003	0.0000	28.9252
Total	**0.0172**	**0.0503**	**0.2071**	**3.4000e-004**		**7.8200e-003**	**7.8200e-003**		**7.5000e-003**	**7.5000e-003**	**0.0000**	**28.7848**	**28.7848**	**5.6200e-003**	**0.0000**	**28.9252**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calimesa Creek Diversion Structures

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - one acre

Construction Phase -

Off-road Equipment - 1 loader/backhoe, 1 excavator, 1 rubber tired loader

Construction Off-road Equipment Mitigation -

Off-road Equipment - 1 loader/backhoe, 1 mixer, 1 pump, 1 excavator

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	12/6/2022	10/11/2022
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Pumps

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOffRoadEquipment	PhaseName		Diversion Structures
tblOnRoadDust	PhaseName	Tie Ins	Diversion Structures
tblTripsAndVMT	PhaseName	Tie Ins	Diversion Structures
tblTripsAndVMT	WorkerTripNumber	13.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5744	5.0713	6.9039	0.0112	0.0000	0.2608	0.2608	0.0000	0.2501	0.2501	0.0000	1,057.659 8	1,057.659 8	0.2065	0.0000	1,062.821 5
Maximum	**0.5744**	**5.0713**	**6.9039**	**0.0112**	**0.0000**	**0.2608**	**0.2608**	**0.0000**	**0.2501**	**0.2501**	**0.0000**	**1,057.659 8**	**1,057.659 8**	**0.2065**	**0.0000**	**1,062.821 5**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5744	1.6756	6.9039	0.0112	0.0000	0.2608	0.2608	0.0000	0.2501	0.2501	0.0000	1,057.659 8	1,057.659 8	0.2065	0.0000	1,062.821 5
Maximum	**0.5744**	**1.6756**	**6.9039**	**0.0112**	**0.0000**	**0.2608**	**0.2608**	**0.0000**	**0.2501**	**0.2501**	**0.0000**	**1,057.659 8**	**1,057.659 8**	**0.2065**	**0.0000**	**1,062.821 5**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**66.96**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Diversion Structures	Trenching	7/20/2022	10/11/2022	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Diversion Structures	Cement and Mortar Mixers	1	6.00	9	0.56
Diversion Structures	Pumps	1	6.00	84	0.74
Diversion Structures	Excavators	1	4.00	158	0.38
Diversion Structures	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Diversion Structures	5	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Diversion Structures - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5744	5.0713	6.9039	0.0112		0.2608	0.2608		0.2501	0.2501		1,057.6598	1,057.6598	0.2065		1,062.8215
Total	**0.5744**	**5.0713**	**6.9039**	**0.0112**		**0.2608**	**0.2608**		**0.2501**	**0.2501**		**1,057.6598**	**1,057.6598**	**0.2065**		**1,062.8215**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Diversion Structures - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5744	1.6756	6.9039	0.0112		0.2608	0.2608		0.2501	0.2501	0.0000	1,057.6598	1,057.6598	0.2065		1,062.8215
Total	**0.5744**	**1.6756**	**6.9039**	**0.0112**		**0.2608**	**0.2608**		**0.2501**	**0.2501**	**0.0000**	**1,057.6598**	**1,057.6598**	**0.2065**		**1,062.8215**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calimesa Storm Drain

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization Urban | **Wind Speed (m/s)** 2.2 | **Precipitation Freq (Days)** 31

Climate Zone 10 | **Operational Year** 2022

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 390.98 | **CH4 Intensity (lb/MWhr)** 0.033 | **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 1 acre

Construction Phase - 60 days

Off-road Equipment - 2 excavators, 1 backhoe, 1 loader, 1 water truck

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	8/31/2022	11/23/2022
tblLandUse	LotAcreage	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	8.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0373	0.3227	0.3665	8.9000e-004	2.6300e-003	0.0134	0.0160	7.0000e-004	0.0123	0.0130	0.0000	77.9972	77.9972	0.0246	6.0000e-005	78.6293
Maximum	**0.0373**	**0.3227**	**0.3665**	**8.9000e-004**	**2.6300e-003**	**0.0134**	**0.0160**	**7.0000e-004**	**0.0123**	**0.0130**	**0.0000**	**77.9972**	**77.9972**	**0.0246**	**6.0000e-005**	**78.6293**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0373	0.3227	0.3665	8.9000e-004	2.6300e-003	0.0134	0.0160	7.0000e-004	0.0123	0.0130	0.0000	77.9971	77.9971	0.0246	6.0000e-005	78.6292
Maximum	**0.0373**	**0.3227**	**0.3665**	**8.9000e-004**	**2.6300e-003**	**0.0134**	**0.0160**	**7.0000e-004**	**0.0123**	**0.0130**	**0.0000**	**77.9971**	**77.9971**	**0.0246**	**6.0000e-005**	**78.6292**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-1-2022**	**9-30-2022**	0.1285	0.1285
		Highest	0.1285	0.1285

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Storm Drain	Trenching	9/1/2022	11/23/2022	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Storm Drain	Excavators	2	7.00	158	0.38
Storm Drain	Off-Highway Trucks	1	7.00	402	0.38
Storm Drain	Rubber Tired Loaders	1	7.00	203	0.36
Storm Drain	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Storm Drain	5	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Storm Drain - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0365	0.3220	0.3580	8.6000e-004		0.0134	0.0134		0.0123	0.0123	0.0000	75.8682	75.8682	0.0245	0.0000	76.4816
Total	**0.0365**	**0.3220**	**0.3580**	**8.6000e-004**		**0.0134**	**0.0134**		**0.0123**	**0.0123**	**0.0000**	**75.8682**	**75.8682**	**0.0245**	**0.0000**	**76.4816**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	6.5000e-004	8.5000e-003	2.0000e-005	2.6300e-003	2.0000e-005	2.6500e-003	7.0000e-004	1.0000e-005	7.1000e-004	0.0000	2.1290	2.1290	6.0000e-005	6.0000e-005	2.1476
Total	**8.1000e-004**	**6.5000e-004**	**8.5000e-003**	**2.0000e-005**	**2.6300e-003**	**2.0000e-005**	**2.6500e-003**	**7.0000e-004**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**2.1290**	**2.1290**	**6.0000e-005**	**6.0000e-005**	**2.1476**

3.2 Storm Drain - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0365	0.3220	0.3580	8.6000e-004		0.0134	0.0134		0.0123	0.0123	0.0000	75.8681	75.8681	0.0245	0.0000	76.4815
Total	**0.0365**	**0.3220**	**0.3580**	**8.6000e-004**		**0.0134**	**0.0134**		**0.0123**	**0.0123**	**0.0000**	**75.8681**	**75.8681**	**0.0245**	**0.0000**	**76.4815**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.1000e-004	6.5000e-004	8.5000e-003	2.0000e-005	2.6300e-003	2.0000e-005	2.6500e-003	7.0000e-004	1.0000e-005	7.1000e-004	0.0000	2.1290	2.1290	6.0000e-005	6.0000e-005	2.1476
Total	**8.1000e-004**	**6.5000e-004**	**8.5000e-003**	**2.0000e-005**	**2.6300e-003**	**2.0000e-005**	**2.6500e-003**	**7.0000e-004**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**2.1290**	**2.1290**	**6.0000e-005**	**6.0000e-005**	**2.1476**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Calimesa Storm Drain

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 1 acre

Construction Phase - 60 days

Off-road Equipment - 2 excavators, 1 backhoe, 1 loader, 1 water truck

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	8.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.2432	10.7541	12.2383	0.0296	0.0894	0.4462	0.5357	0.0237	0.4105	0.4343	0.0000	2,869.4818	2,869.4818	0.9037	1.9600e-003	2,892.6583
Maximum	**1.2432**	**10.7541**	**12.2383**	**0.0296**	**0.0894**	**0.4462**	**0.5357**	**0.0237**	**0.4105**	**0.4343**	**0.0000**	**2,869.4818**	**2,869.4818**	**0.9037**	**1.9600e-003**	**2,892.6583**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	1.2432	10.7541	12.2383	0.0296	0.0894	0.4462	0.5357	0.0237	0.4105	0.4343	0.0000	2,869.4818	2,869.4818	0.9037	1.9600e-003	2,892.6583
Maximum	**1.2432**	**10.7541**	**12.2383**	**0.0296**	**0.0894**	**0.4462**	**0.5357**	**0.0237**	**0.4105**	**0.4343**	**0.0000**	**2,869.4818**	**2,869.4818**	**0.9037**	**1.9600e-003**	**2,892.6583**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Storm Drain	Trenching	9/1/2022	11/23/2022	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Storm Drain	Excavators	2	7.00	158	0.38
Storm Drain	Off-Highway Trucks	1	7.00	402	0.38
Storm Drain	Rubber Tired Loaders	1	7.00	203	0.36
Storm Drain	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Storm Drain	5	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Storm Drain - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2157	10.7348	11.9334	0.0288		0.4457	0.4457		0.4100	0.4100		2,787.6792	2,787.6792	0.9016		2,810.2190
Total	**1.2157**	**10.7348**	**11.9334**	**0.0288**		**0.4457**	**0.4457**		**0.4100**	**0.4100**		**2,787.6792**	**2,787.6792**	**0.9016**		**2,810.2190**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0275	0.0194	0.3049	8.1000e-004	0.0894	5.3000e-004	0.0900	0.0237	4.9000e-004	0.0242		81.8026	81.8026	2.1400e-003	1.9600e-003	82.4393
Total	**0.0275**	**0.0194**	**0.3049**	**8.1000e-004**	**0.0894**	**5.3000e-004**	**0.0900**	**0.0237**	**4.9000e-004**	**0.0242**		**81.8026**	**81.8026**	**2.1400e-003**	**1.9600e-003**	**82.4393**

3.2 Storm Drain - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2157	10.7348	11.9334	0.0288		0.4457	0.4457		0.4100	0.4100	0.0000	2,787.6792	2,787.6792	0.9016		2,810.2190
Total	**1.2157**	**10.7348**	**11.9334**	**0.0288**		**0.4457**	**0.4457**		**0.4100**	**0.4100**	**0.0000**	**2,787.6792**	**2,787.6792**	**0.9016**		**2,810.2190**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0275	0.0194	0.3049	8.1000e-004	0.0894	5.3000e-004	0.0900	0.0237	4.9000e-004	0.0242		81.8026	81.8026	2.1400e-003	1.9600e-003	82.4393
Total	**0.0275**	**0.0194**	**0.3049**	**8.1000e-004**	**0.0894**	**5.3000e-004**	**0.0900**	**0.0237**	**4.9000e-004**	**0.0242**		**81.8026**	**81.8026**	**2.1400e-003**	**1.9600e-003**	**82.4393**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calimesa Creek Tie-Ins

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - one acre

Construction Phase -

Off-road Equipment - 1 loader/backhoe, 1 excavator, 1 rubber tired loader

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	12/6/2022	8/30/2022
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	PhaseName		Tie Ins
tblOffRoadEquipment	PhaseName		Tie Ins
tblOffRoadEquipment	PhaseName		Tie Ins
tblTripsAndVMT	WorkerTripNumber	13.00	0.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	8.0500e-003	0.0794	0.0877	1.8000e-004	0.0000	3.4700e-003	3.4700e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	15.4400	15.4400	4.9900e-003	0.0000	15.5648
Maximum	**8.0500e-003**	**0.0794**	**0.0877**	**1.8000e-004**	**0.0000**	**3.4700e-003**	**3.4700e-003**	**0.0000**	**3.1900e-003**	**3.1900e-003**	**0.0000**	**15.4400**	**15.4400**	**4.9900e-003**	**0.0000**	**15.5648**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	8.0500e-003	0.0251	0.0877	1.8000e-004	0.0000	3.4700e-003	3.4700e-003	0.0000	3.1900e-003	3.1900e-003	0.0000	15.4400	15.4400	4.9900e-003	0.0000	15.5648
Maximum	**8.0500e-003**	**0.0251**	**0.0877**	**1.8000e-004**	**0.0000**	**3.4700e-003**	**3.4700e-003**	**0.0000**	**3.1900e-003**	**3.1900e-003**	**0.0000**	**15.4400**	**15.4400**	**4.9900e-003**	**0.0000**	**15.5648**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**68.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2022	9-30-2022	0.0875	0.0332
		Highest	0.0875	0.0332

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Tie Ins	Trenching	7/20/2022	8/30/2022	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Tie Ins	Excavators	1	6.00	158	0.38
Tie Ins	Rubber Tired Loaders	1	6.00	203	0.36
Tie Ins	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Tie Ins	5	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Tie Ins - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.0500e-003	0.0794	0.0877	1.8000e-004		3.4700e-003	3.4700e-003		3.1900e-003	3.1900e-003	0.0000	15.4400	15.4400	4.9900e-003	0.0000	15.5648
Total	**8.0500e-003**	**0.0794**	**0.0877**	**1.8000e-004**		**3.4700e-003**	**3.4700e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**15.4400**	**15.4400**	**4.9900e-003**	**0.0000**	**15.5648**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Tie Ins - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.0500e-003	0.0251	0.0877	1.8000e-004		3.4700e-003	3.4700e-003		3.1900e-003	3.1900e-003	0.0000	15.4400	15.4400	4.9900e-003	0.0000	15.5648
Total	**8.0500e-003**	**0.0251**	**0.0877**	**1.8000e-004**		**3.4700e-003**	**3.4700e-003**		**3.1900e-003**	**3.1900e-003**	**0.0000**	**15.4400**	**15.4400**	**4.9900e-003**	**0.0000**	**15.5648**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	3.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**3.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Calimesa Creek Tie-Ins

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - one acre

Construction Phase -

Off-road Equipment - 1 loader/backhoe, 1 excavator, 1 rubber tired loader

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseEndDate	12/6/2022	8/30/2022
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		Tie Ins
tblOffRoadEquipment	PhaseName		Tie Ins
tblOffRoadEquipment	PhaseName		Tie Ins
tblTripsAndVMT	WorkerTripNumber	13.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5369	5.2951	5.8457	0.0117	0.0000	0.2314	0.2314	0.0000	0.2129	0.2129	0.0000	1,134.6449	1,134.6449	0.3670	0.0000	1,143.8191
Maximum	**0.5369**	**5.2951**	**5.8457**	**0.0117**	**0.0000**	**0.2314**	**0.2314**	**0.0000**	**0.2129**	**0.2129**	**0.0000**	**1,134.6449**	**1,134.6449**	**0.3670**	**0.0000**	**1,143.8191**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.5369	1.6756	5.8457	0.0117	0.0000	0.2314	0.2314	0.0000	0.2129	0.2129	0.0000	1,134.6449	1,134.6449	0.3670	0.0000	1,143.8191
Maximum	**0.5369**	**1.6756**	**5.8457**	**0.0117**	**0.0000**	**0.2314**	**0.2314**	**0.0000**	**0.2129**	**0.2129**	**0.0000**	**1,134.6449**	**1,134.6449**	**0.3670**	**0.0000**	**1,143.8191**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**68.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Tie Ins	Trenching	7/20/2022	8/30/2022	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Tie Ins	Excavators	1	6.00	158	0.38
Tie Ins	Rubber Tired Loaders	1	6.00	203	0.36
Tie Ins	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Tie Ins	5	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Tie Ins - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5369	5.2951	5.8457	0.0117		0.2314	0.2314		0.2129	0.2129		1,134.6449	1,134.6449	0.3670		1,143.8191
Total	**0.5369**	**5.2951**	**5.8457**	**0.0117**		**0.2314**	**0.2314**		**0.2129**	**0.2129**		**1,134.6449**	**1,134.6449**	**0.3670**		**1,143.8191**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Tie Ins - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5369	1.6756	5.8457	0.0117		0.2314	0.2314		0.2129	0.2129	0.0000	1,134.6449	1,134.6449	0.3670		1,143.8191
Total	**0.5369**	**1.6756**	**5.8457**	**0.0117**		**0.2314**	**0.2314**		**0.2129**	**0.2129**	**0.0000**	**1,134.6449**	**1,134.6449**	**0.3670**		**1,143.8191**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.543376	0.059966	0.184357	0.131187	0.023843	0.006245	0.012012	0.009162	0.000826	0.000515	0.023898	0.000748	0.003864

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ACOUSTICAL IMPACT ANALYSIS

CALIMESA CREEK STAGE III PROJECT

CITY OF CALIMESA and YUCAIPA, CALIFORNIA

Prepared by:

Sara Friedman-Gerrick
Giroux & Associates

Prepared for:

Phil Martin & Associates
Attn: Phil Martin

Date:

February 15, 2022

Project No.: P22-006 N

NOISE SETTING

NOISE DESCRIPTORS

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally considered to be unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The decibel (dB) scale is used to quantify sound pressure levels. Although decibels are most commonly associated with sound, "dB" is a generic descriptor that is equal to ten times the logarithmic ratio of any physical parameter versus some reference quantity. For sound, the reference level is the faintest sound detectable by a young person with good auditory acuity.

Since the human ear is not equally sensitive to all sound frequencies within the entire auditory spectrum, human response is factored into sound descriptions by weighting sounds within the range of maximum human sensitivity more heavily in a process called “A-weighting,” written as dB(A). Any further reference in this discussion to decibels written as "dB" should be understood to be A-weighted.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called LEQ), or alternately, as a statistical description of the sound pressure level that is exceeded over some fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to quiet time noise levels in a 24-hour noise descriptor called the Ldn (day-night) or the Community Noise Equivalent Level (CNEL). The CNEL metric has gradually replaced the Ldn factor, but the two descriptors are essentially identical.

CNEL-based standards are generally applied to transportation-related sources because local jurisdictions are pre-empted from exercising direct noise control over vehicles on public streets, aircraft, trains, etc. The City of Calimesa therefore regulates the noise exposure of the receiving property through land use controls.

For “stationary” noise sources, or noise sources emanating from private property the City does have legal authority to establish noise performance standards designed to not adversely impact adjoining uses. These standards are typically articulated in the Municipal Code. These standards recognize the varying noise sensitivity of both transmitting and receiving land uses. The property line noise performance standards are normally structured according to land use and time-of-day.

NOISE STANDARDS

Calimesa

For stationary noise sources located proximate to residential uses, the City of Calimesa proposes the noise exposure planning policy contained in Section 8.15.040 of the Municipal Code. These noise standards must be met at the nearest sensitive receptors in the vicinity of any stationary or operational source of noise originating from the project. The policy applies to any on-site activities and are shown in Table 1

Table 1
Calimesa Sound level limits

Zone	Applicable Limit One-Hour Average Sound Level (In Decibels)	
R-1, R-T, R-2, R-R and S-P regulations with a density of five dwelling units or less per acre	10:00 p.m. to 7:00 a.m.	40
	7:00 a.m. to 10:00 p.m.	50
R-3, S-P and PRD regulations with a density of six or more dwelling units per acre	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
C-P-S, C-P, C-O	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	55
M	7:00 a.m. to 10:00 p.m.	70
	10:00 p.m. to 7:00 a.m.	50

Noise from construction equipment is exempt for the regulations in Table 1 but is required to adhere to noise standards as stated in Section 8.15.080 of the Municipal Code:

> "It is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 7:00 a.m. or after 7:00 p.m. In addition, it is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on Saturdays and Sundays, January 1st, the last Monday in May, known as "Memorial Day," July 4th, the first Monday in September, Thanksgiving Day and December 25th. When January 1st, July 4th, or December 25th fall on a Sunday, it is unlawful for any person to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on the following Monday"

In addition to these times of day construction requirements, the Municipal Code also requires that construction related noise will not exceed a level of 75 dBA for more than 8 hours during a 24-hour period. There are permissible deviations to this standard if construction only occurs sporadically as shown in Table 2.

Table 2
Construction Noise Levels Adjustments

Total Duration in 24 Hours	Decibel Level Allowance	Total Decibel Level
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+9	84
Up to 2 hours	+6	81
Up to 4 hours	+3	78
Up to 8 hours	0	75

Yucaipa

Section 87.0905 of the Yucaipa Municipal Code outlines the noise standards applicable to projects within its jurisdiction. The City has adopted the following standards for emanations from any source as it affects adjacent properties.

Table 3
Yucaipa Noise Standards

Affected Land Use	Applicable Sound Level (In Decibels)	
Residential	Anytime	55
Professional Services	Anytime	55
Other Commercial	Anytime	60
Industrial	Anytime	70

In Section 87.0905(e), Exempt Noises, temporary construction, repair, or demolition activities between 7am and 7pm, except Sundays and Federal holidays are exempted from these noise standards.

The City of Yucaipa also has a vibration standard in its Municipal Code Section 87.0910. However, construction is exempt from this requirement if it occurs between 7 a.m. and 7 p.m., except Sundays and Federal holidays.

GROUNDBORNE VIBRATION

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface move away from its original static position. The instantaneous speed that a point on a surface move is described as the velocity and the rate of change of the speed is described as the acceleration. Each of these descriptors can be used to correlate vibration to building damage, and acceptable equipment vibration levels.

During construction, the operation of construction equipment can cause groundborne vibration. This type of vibration is best measured in terms of velocity or acceleration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. The units for PPV velocity is normally inches per second (in/sec). PPV is defined as the maximum instantaneous peak of the vibration signal and is considered appropriate for evaluating potential building damage. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration.

BASELINE NOISE LEVELS

The City's of Calimesa and Yucaipa are located in in Riverside County near the San Bernardino County border. The proposed storm drain pipeline will be located within the roadway right-of-way on County Line Road between 5th Street and the I-10. The proposed detention basin will be located on the south side of County Line Road and the west side of 3rd Street.

Noise measurements were made in order to document existing baseline levels in the area on Tuesday, September 3, 2019. Measurements were made between 1:00 and 2:30 a.m. and were located to be representative of both the pipeline and detention basin activities. The results are shown below in Table 4.

Table 4
Baseline Noise Levels (dBA)

Meter	Location	Leq	Lmax	Lmin
1	County Line Road by Holiday Rancho Mobile Home Park	62	74	41
2	NE Corner Proposed Basin Site by County Line Rd	54	68	47
3	NW Corner Proposed Basin Site by County Line Rd	56	79	40

Meter 1 is representative of noise levels along the pipeline alignment. The noise meter was located on County Line Road near the entrance to the Holiday Ranch Mobile Home Park. This location is in proximity to the I-10 freeway. A noise level of almost 62 dBA Leq was observed.

Farther east from the I-10 freeway the observed noise levels were lower. At the proposed basin site adjacent to the County Line Road perimeter observed noise levels ranged from 54-56 dBA Leq.

Monitoring experience has shown that 24-hour weighted CNELs are typically 2 to 3 dB higher than mid-day Leq readings (Caltrans Technical Noise Supplement, 2009). This would equate to existing CNELs in the 64-65 dBA range at the front facades of noise-sensitive uses adjacent to the pipeline installation. At the location of the proposed basin, existing noise levels would equate to 56-59 dBA CNEL.

PROJECT NOISE IMPACTS

THRESHOLDS OF SIGNIFICANCE

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they result in:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b. Generation of excessive groundborne vibration or groundborne noise levels.

c. For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels.

The noise impact assessment evaluates short-term (temporary) impacts associated with project construction as well as long-term (permanent) impacts resulting from project operation. For construction noise, the potential for impacts is assessed by considering several factors, including the proximity of construction-related noise sources to sensitive receptors, typical noise levels associated with construction equipment (including construction-related vehicles), the potential for construction noise levels to interfere with adjacent residential activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside the construction time limits specified in the Noise Ordinance. The project is not expected to create any long-term operational noise increases associated with either the basin, diversion structures, tie-ins or storm drain installation.

Construction noise is typically governed by ordinance limits on allowable times of equipment operations and requires a noise level of less than 75 dBA Leq at a receiving property. The City of Calimesa limits the hours of construction operation to be between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 10:00 a.m. and 5:00 p.m. on Saturdays or Sundays or holidays. The City of Yucaipa exempts noise generated from construction activities as long as it occurs between 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays with no construction on Sundays or federal holidays.

SENSITIVE RECEPTORS

There are scattered residences along the storm drain alignment. The closest residences have an approximate 50-foot setback from the roadway centerline. The area surrounding the tie-ins have similar setbacks. Because the two activities have similar construction sequences they are analyzed as a single component.

There are residences surrounding the detention basin site on County Line Road and 3rd Street. The closest homes take access from 3rd Street and are immediately adjacent to the eastern basin property line. The basin is approximately 480 feet in diameter. The closest home has an approximate 50-foot separation from the basin perimeter and almost a 300-foot separation from the site center. At completion, the top of the basin will be at ground level and the bottom will be approximately -25 feet below grade. When equipment operates at the lower elevation, noise will fall off dramatically because of the shielding offered by the below ground pit. Therefore, sensitive uses adjacent to the retention basin will experience progressively lower construction noise as construction progresses.

The low-flow water diversion structure is within Calimesa Creek adjacent to and west of 5th Street and east of Park Avenue. There are a few scattered homes to the south with an approximate 75-foot setback. The multi-family homes to the north, across County Line Road have a larger setback.

CONSTRUCTION NOISE IMPACTS

Construction noise levels would vary at any given receptor depending on the construction phase, equipment type, duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor. For this analysis, construction noise levels were estimated for proposed daytime construction.

The construction noise analysis shows that the nearby sensitive residential receivers will likely experience a temporary/periodic increase above ambient noise levels. Construction noise is unavoidable though noise would be temporary and limited to the duration of the construction in any one location. These temporary impacts will cease once each portion of pipeline is completed.

In 2006, the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model that includes a national database of construction equipment reference noise emissions levels. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power during a construction phase. The usage factor is a key input variable that is used to calculate the average Leq noise levels.

Table 5 identifies highest (Lmax) noise levels associated with each type of equipment identified for use, then adjusts this noise level for distance to the closest sensitive receptors and the extent of equipment usage (usage factor), which is represented as Leq.

Quantitatively, the primary noise prediction equation is expressed as follows for the hourly average noise level (Leq) at distance D between the source and receiver (dBA):

Leq = Lmax @ 50’ – 20 log (D/50’) + 10log (U.F%/100) – I.L.(bar)

Where:

Lmax @ 50’ is the published reference noise level at 50 feet
U.F.% is the usage factor for full power operation per hour
I.L.(bar) is the insertion loss for intervening barriers

Point sources of noise emissions are attenuated by a factor of 6 dB per doubling of distance through geometrical (spherical) spreading of sound waves.

Table 5
Construction Noise Impact
Reference Noise Levels

Equipment	Usage Factor	Reference Noise Level 50 ft (dBA)	Average Noise 50 ft (dBA)
Excavators	40%	81	77
Loader	40%	79	75
Backhoe	37%	78	74
Water Truck*	40%	76	72
Scraper	40%	84	80
Dozer	40%	82	78
Concrete Pump	20%	81	74
Concrete Mixer	40%	79	75

*Used noise levels for dump truck as no data for water truck available

Table 6
Construction Noise Impact
Detention Basin (Noise at Closest Receiver)

Equipment	Avg Noise at Site Edge (dBA)	Avg Noise at Center Site (dBA)*
Excavator	77	49
Dozer	78	50
Scraper	80	52
Loader	75	47
Water Truck	72	44

*Attenuated for distance and below grade elevation

Table 7
Construction Noise Impact
Diversion Structure (Noise at Closest Receiver)

Equipment	Avg Noise Closest Receptor (dBA)
Excavator	74
Concrete Pump	70
Concrete Mixer	71
Loader	71

Noise impacts would be significant if they caused a violation of any adopted standards. The daytime noise standard is 75 dBA Leq. For the detention basin, as shown in Table 6, modeling equipment in the site center (some equipment may be closer others farther), will not cause an exceedance of standards even if 2-3 pieces of equipment were operating simultaneously. In addition, at the perimeter there will be a 3 to 3.5-foot masonry wall. The top of the basin is at ground level and the basin progressively gets deeper and deeper towards the center of the site for an ultimate depth of -25 feet from the surface.

As construction progresses equipment will be located below ground level. The equipment operational height together with the 3 to 3.5-foot masonry wall will provide an effective 28-foot height differential at the basin bottom. This will provide at least -15 dBA of noise attenuation for the adjacent residences. Therefore, at the start of construction, when equipment operates directly at the property line, noise levels might be slightly in excess of the 75 dBA Leq goal. However, as construction progresses, attenuation due to distance and elevation differential will reduce noise levels at any receptor to 44-52 dBA Leq.

The low-flow diversion structure varies in width but is an average of 75 feet from the two single-family residences to the south. It is not expected that noise levels will exceed the 75 dBA Leq goal as shown in Table 7. Most adjacent sensitive receptors are the multi-family units to the north, across County Line Road with an approximate 150-foot setback distance. If structures within 75 feet are not expected to be exposed to a construction noise level in excess of the noise goal, then the multi-family units to the north with a 150-foot setback would experience an even greater level of noise protection.

At the closest residential setback of 50 feet, noise levels along the various storm drain alignments and main line tie-ins are estimated to range between 72 and 78 dBA (Leq). The noisiest activities occur during pavement excavation. These maximal noise levels are limited to the time it takes to remove pavement (if necessary) and dig trenches. The project engineer estimates the linear progress rate for the pipeline is 100 feet per day. Equipment operating adjacent to any residence would be brief and would affect a given sensitive receptor for only a short period of time. While such noise levels will be noticeable at times, these exceedances would be sporadic (not continuous) in nature, limited in duration, and would occur only when equipment is typically operated within 50 feet of a given receptor. By 75 feet, noise levels would be below 75 dBA Leq. Additionally, as seen in Table 2, the Calimesa Noise Code allows for upward adjustment of the noise standard when equipment operates for less than 8 hours. Although difficult to estimate, any single piece of heavy equipment will only operate within 50 feet of a residence for a short time and not 8 straight hours. For example, for 2 hours of continuous noise, the construction threshold is adjusted upward by +6 dBA such that the resultant noise threshold increases to 81 dBA and construction noise would not exceed the standard.

Additionally, activities are limited to daytime hours when most people are away. According to the City of Calimesa Municipal Code, permissible hours of construction are between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 10:00 a.m. and 5:00 p.m. on Saturdays or Sundays or holidays. Although the City of Yucaipa does not have any regulations on construction noise levels, compliance with the Calimesa requirements would provide assurance that construction noise levels are not intrusive. The City of Yucaipa only allows construction between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays. No construction is permitted on Sundays or holidays.

These hours are included as conditions on any project construction permits and these limits will serve to minimize any adverse construction noise impact potential. Because maximum storm drain installation noise would occur for only a few days near any noise-sensitive land use, and because the detention basin occurs over a large site that ultimately is at an elevation of -25 feet below grade, construction activity noise impacts are considered less-than-significant.

CONSTRUCTION ACTIVITY VIBRATION

Project-related pavement cutting, excavation and construction activities could result in vibration that could disturb nearby residents and cause cosmetic damage to existing adjacent buildings or structures.

Ground-borne vibration occurs when heavy equipment travels over unpaved surfaces or when it is engaged in soil movement. The effects of ground-borne vibration include discernable movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. Vibration related problems generally occur due to resonances in the structural components of a building because structures amplify groundborne vibration. Within the "soft" sedimentary surfaces of much of Southern California, ground vibration is quickly damped out. Groundborne vibration is almost never annoying to people who are outdoors (FTA 2006).

Groundborne vibrations from construction activities rarely reach levels that can damage structures. Because vibration is typically not an issue, very few jurisdictions have adopted vibration significance thresholds. Vibration thresholds have been adopted for major public works construction projects, but these relate mostly to structural protection (cracking foundations or stucco) rather than to human annoyance.

The vibration descriptor commonly used to determine structural damage is the peak particle velocity (ppv) which is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in in/sec. The range of such vibration is as follows in Table 8:

Table 8
Human Response To Transient Vibration

Average Human Response	ppv (in/sec)
Severe	2.00
Strongly perceptible	0.90
Distinctly perceptible	0.24
Barely perceptible	0.03

Source: Caltrans Transportation and Construction Vibration Guidance Manual, 2013.

Over the years, numerous vibration criteria and standards have been suggested by researchers, organizations, and governmental agencies. There are no Caltrans or Federal Highway Administration standards for vibration.

According to Caltrans, the threshold for structural vibration damage for modern structures is 0.5 in/sec for intermittent sources, which include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment. The American Association of State Highway and Transportation Officials (AASHTO) (1990) identifies maximum vibration levels for preventing damage to structures from intermittent construction or maintenance activities for residential buildings in good repair with gypsum board walls to be 0.4–

0.5 in/sec. Below this level there is virtually no risk of building damage. Table 9 shows the predicted vibration levels generated by construction equipment.

Table 9
Estimated Vibration Levels During Project Construction

Equipment	PPV at 10 ft (in/sec)	PPV at 15 ft (in/sec)	PPV at 25 ft (in/sec)	PPV at 50 ft (in/sec)
Large Bulldozer	0.352	0.191	0.089	0.031
Loaded trucks	0.300	0.152	0.076	0.027
Jackhammer	0.138	0.070	0.035	0.012
Small Bulldozer	0.012	0.006	0.003	0.001

Source: FHWA Transit Noise and Vibration Impact Assessment

The calculation to determine PPV at a given distance is:

PPVdistance = PPVref*(25/D)^1.5

Where:

PPVdistance = the peak particle velocity in inches/second of the equipment adjusted for distance,

PPVref = the reference vibration level in inches/second at 25 feet, and

D = the distance from the equipment to the receiver.

As shown even equipment operating very near a residence would not cause damage although the vibration could be in the annoyance range. Regardless, is unlikely that a large bulldozer or loaded truck would ever operate 10 feet from a structure. Therefore, vibration levels will be any possible cosmetic damage level.

SITE OPERATIONAL NOISE

Operation of the detention basins, low-flow diversion structures and drains and tie-ins would not result in significant noise impacts, since these facilities would be located below ground surface.

SUMMARY

Short-term construction noise intrusion and vibration impacts will be limited by conditions on construction permits requiring compliance with the City of Calimesa Noise Ordinance. The allowed hours of construction are between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 10:00 a.m. and 5:00 p.m. on Saturdays or Sundays or holidays. The City of Yucaipa's allowable hours of construction are 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays. In addition, the following standard construction practices are required:

- All construction equipment shall use properly operating mufflers.
- Stockpiling and staging activities must be located as far as practicable from dwellings.
- All mobile equipment shall have properly operating and maintained mufflers.

Construction vibration would not exceed any damage thresholds at the nearest sensitive uses.

Operation of the project would not result in significant noise impacts.

Appendix H – VMT Report

Stantec

Memo

To:	Phil Martin	From:	Cathy Lawrence
	Phil Martin Associates 2987 NW Fairway Heights Drive Bend OR 97703		38 Technology Drive, Suite 200 Irvine CA 92618
File:	2042581300	Date:	February 18, 2022

Reference: Truck Haul Route for Calimesa Channel Stage 3 Detention Basin Vehicle Miles Traveled Assessment

The Truck Haul Route for Calimesa Channel Stage 3 Detention Basin (Project) was evaluated for local transportation effects as detailed in *Truck Haul Route for Calimesa Channel 3 Detention Basin to San Timoteo Landfill Traffic Impact Study* dated October 30, 2019 prepared by Stantec Consulting Services Inc. (Stantec). That traffic impact analysis used level of service (LOS) methodology based on vehicle delay calculations to determine peak hour intersection impacts. Senate Bill 743 (SB 743) has replaced LOS with "Vehicle Miles Traveled" (VMT) as the metric for identifying California Environmental Quality Act (CEQA) transportation impacts. This memorandum summarizes the potential environmental transportation impacts of the Project consistent with SB 743.

The proposed Project consists of the exportation of dirt from the Calimesa Channel 3 detention basin during a two- to three-month construction period. The proposed truck haul route covers approximately 11 miles from the Calimesa Channel Stage 3 detention basin to the San Timoteo Landfill in Redlands.

VEHICLE MILES TRAVELED

SB 743 has identified VMT as the metric for identifying CEQA transportation impacts. To comply with the requirements of SB 743, the City of Calimesa has defined the conditions for conducting CEQA VMT analysis.[1] The City has identified project types that are local serving by nature as having the presumption of a less than significant impact. The City uses VMT per service population for its impact threshold.

The Project consists of truck trips from the detention basin construction site to the San Timoteo Landfill during the temporary construction period. The truck haul route would be active only during the two- to three-month construction period, and VMT analysis is not applicable to temporary construction traffic. Furthermore, these approximately 11-mile trips would be considered local serving trips.

CONCLUSIONS

The Project consists of a temporary truck haul route during construction of the Calimesa Channel Stage 3 Detention Basin. VMT is not applicable to temporary construction traffic. Since the Project consists of hauling of dirt from the construction site over only a two- to three-month period, no further VMT analysis is required.

[1] City of Calimesa, CA. May 2020. *Final City of Calimesa Transportation Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment.*

Reference: Truck Haul Route for Calimesa Channel Stage 3 Detention Basin Vehicle Miles Traveled Assessment

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