APPENDIX A

2017 Initial Study/Mitigated Negative Declaration and Public/Agency Comment Letters

A1 - Use and Applicability of the 2017 IS/MND for the Rio Mesa Draft EIR

A2 - 2017 2017 IS/MND for the Rio Mesa Draft EIR

A3 - Public/Agency Comment Letters

APPENDIX A-1

A1 - Use and Applicability of the 2017 IS/MND for the Rio Mesa Draft EIR

Appendix A-1

Use and Applicability of the 2017 Rio Mesa Boulevard Initial Study/Mitigated Negative Declaration

As discussed in Section of the 4.1 of the 2021 Rio Mesa Boulevard Draft Environmental Impact Report (DEIR), the County of Madera (County) circulated for public review a Draft Initial Study/Mitigated Negative Declaration (IS/MND) on the Rio Mesa Boulevard Project (Project) in October 2017. Based on public comments on the 2017 IS/MND and further consideration, the County decided to prepare an EIR for the Project. The 2017 IS/MND is provided as Appendix A-2 of the DEIR and was used as the basis for focusing the DEIR's analysis on the Project's potentially significant effects and not further analyzing the Project's effects that are insignificant, as contemplated by CEQA. (CEQA Guidelines §§ 15006(d), 15063(c)(3).)

Specifically, CEQA Guidelines, § 15143 provides that:

> "Effects dismissed in an Initial Study as clearly insignificant and unlikely to occur need not be discussed further in the EIR unless the Lead Agency subsequently receives information inconsistent with the finding in the Initial Study. A copy of the Initial Study may be attached to the EIR to provide the basis for limiting the impacts discussed."

CEQA Guidelines § 15128 further provides:

> "An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an Initial Study" [see also: Pub. Res. Code §§ 21002.1(e), 21100(c); CEQA Guidelines, §§ 15006(d), 15063(c)(3)].

The discussion provided in Section 4.1 of the DEIR summarizes issues that were found to have no potential for significant impact and require no further evaluation in the DEIR. These resource topics include: Aesthetics; Agriculture and Forestry Resources; Geology and Soils: Hazards and Hazardous Materials: Mineral Resources; Population and Housing; Public Services; Recreation; Utilities and Service Systems; and Wildfire. The following discussion presents additional support for those statements and the use of the 2017 IS/MND in support of those conclusions.

For each resource topic that was analyzed in the 2017 IS/MND and eliminated from further analysis in the DEIR, the following discussion addresses whether:

1) amendments to the CEQA Guidelines Appendix G Environmental Checklist (Checklist) prompts have been adopted since 2017 for that particular topic;

2) substantive changes in environmental baseline conditions pertaining to the topic have occurred between circulation of the 2017 IS/MND and publication of the DEIR's Notice of Preparation (NOP) in October 2019; and

3) impact analyses presented in IS/MND remain adequate to support a conclusion of no impact or less-than-significant impact.

With regard to item 2, above, environmental baseline conditions described in the 2017 IS/MND were considered for each resource topic listed below. These conditions were compared to conditions extant at the time of the publication of the 2019 NOP. If no evidence was found to indicate that a significant change in conditions had occurred, it was determined that analyses of impacts based on environmental baseline conditions in 2017 were still valid and applicable when the NOP was published in October 2019.

Aesthetics

Since circulation of the 2017 IS/MND, the CEQA Guidelines Appendix G Environmental Checklist for Aesthetics Item "c" was amended. The prompt now reads as follows with new text underlined:

> Would the project: 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?

The revisions to Item "c" of the CEQA Guidelines Appendix G Environmental Checklist do not affect the analysis presented in the 2017 IS/MND for the following reasons. First, various elements of the Project would be in public view from SR 41 and Avenue 12, and this was taken into consideration in the 2017 IS/MND. Second, the Project Site is in an undeveloped rural area, not an urbanized area. Thus, the prompt's revised text does not affect the analysis or conclusions in the Aesthetics analysis.

Environmental baseline conditions used in the 2017 IS/MND aesthetics analysis were unchanged in the time between circulation of the 2017 IS/MND and publication of the Notice of Preparation for the DEIR in October 2019.

For the above reasons, the analysis of aesthetic impacts presented in the 2017 IS/MND, and its determination of less-than-significant impact remains the same and does not require further discussion in the DEIR. For purposes of clarification however, it should be noted that the streetlights to be installed under the Project would comply with all applicable requirements regarding illumination, safety, and glare-reduction. This further supports the determination of the Project's less-than-significant impact on aesthetic resources.

Agriculture and Forestry Resources

The CEQA Guidelines Appendix G Environmental Checklist for Agriculture and Forestry Resources Items "a" through "e" have not been amended since circulation of the 2017 IS/MND. Further, no changes to the Farmland Mapping and Monitoring Program mapping designations for the Project Site or zoning designations for the site were made in the time between circulation of the 2017 IS/MND and the DEIR

NOP. As such, the analysis of potential Project impacts on agriculture and forestry resources remains adequate to support the conclusion of less-than-significant impact for the Project.

Geology and Soils

The CEQA Guidelines Appendix G Environmental Checklist for Geology and Soils items "a" and "d" were amended subsequent to circulation of the 2017 IS/MND, as follows:

> Would the project: a) ~~Expose people of structures to~~ Directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving:
>
> Would the project: 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?

Neither of the above amendments affect the analysis or conclusions presented in the 2017 IS/MND as the 2017 analysis addressed both direct and indirect impacts of the Project. Further, environmental baseline conditions pertaining to geology and soils on the Project Site did not substantively change between circulation of the 2017 IS/MND and publication of the NOP for the DEIR in October 2019. For these reasons, the analysis of potential Project impacts on geology and soil resources remains adequate to support the conclusion of less-than-significant impact for the Project.

For clarification purposes, the 2017 IS/MND finding of less-than-significant impact on soil erosion pertains to Project operations as well as construction activities. Also, we note that the DEIR provides additional analysis relevant to soil erosion and its effect on water quality in Section 4.6 (Hydrology and Water Quality) of the DEIR in support of the determination of less-than-significant impact with mitigation.

Hazards and Hazardous Materials

An amendment to the CEQA Guidelines Appendix G Environmental Checklist for Hazards and Hazardous Materials item "e" was made subsequent to circulation of the 2017 IS/MND, as follows:

> 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 or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Additionally, item "f" of the CEQA Guidelines Appendix G Environmental Checklist for Hazards and Hazardous Materials was removed. As a result, the lettering for items "g" and "h" were changed to "f" and "g", respectively. Lastly, item h became item "g", and was amended as follows:

> ~~h)~~ g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires~~ including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands~~?

The above amendments do not affect the analysis or conclusions presented in the 2017 IS/MND as the 2017 analysis did in fact address direct and indirect impact of the Project. Further, environmental baseline conditions pertaining to hazards and hazardous materials on the Project Site did not substantively change in between circulation of the 2017 IS/MND and publication of the NOP for the DEIR in October 2019. For these reasons, the analysis of potential Project impacts related to hazards and hazardous materials remains adequate to support the conclusion of less-than-significant impact for the Project. Additional information concerning potential Project impacts related to the risk of wildfire is included in Section 4.1 of the DEIR in support of the finding of less-than-significant impact presented in the 2017 IS/MND. Further, for purposes of clarification, in addition to compliance with federal requirements for the transportation of hazardous materials, the Project shall comply with all applicable federal, state and local laws and regulations pertaining to the handling, use, and disposal of hazardous materials.

Mineral Resources

No amendments to the CEQA Guidelines Appendix G Environmental Checklist for Mineral Resources have been adopted since circulation of the 2017 IS/MND. In addition, no changes to environmental baseline conditions relative to mineral resources on the Project Site occurred in the time between circulation of the IS/MND and the DEIR NOP. As such, the analysis of mineral resource impacts presented in the 2017 IS/MND, and its determination of less-than-significant impact remains accurate and adequate.

Population and Housing

The CEQA Guidelines Appendix G Environmental Checklist for Population and Housing items "a" and "b" were amended subsequent to circulation of the 2017 IS/MND, as follows:

> Would the project: a) Induce substantial <u>unplanned</u> 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)?
>
> Would the project: b) Displace substantial numbers of existing <u>people or</u> housing, necessitating the construction of replacement housing elsewhere?

Further, item "c" the CEQA Guidelines Appendix G Environmental Checklist for Population and Housing was eliminated subsequent to circulation of the 2017 IS/MND.

No substantive changes in baseline conditions for population and housing occurred in the time between circulation of the 2017 IS/MND and the DEIR NOP that would affect the analysis or conclusions presented in the 2017 IS/MND. The insertion of the term "unplanned" population growth into item "a", above, lends support and clarification to the finding of less-than-significant impact in the 2017 IS/MND. As discussed in greater detail in Section 6.3 (Growth Inducement) of the DEIR, the construction of Rio Mesa Boulevard is included in approved County planning documents including but not limited to the Rio Mesa Area Plan (RMAP) and the 2015 Official Plan Line as amended in 2016. The roadway is intended to accommodate only planned development. Since the Project is planned to be constructed in advance of anticipated future development of properties adjacent to the Project Site, the utility infrastructure proposed for the Project would be sized to accommodate only planned future demand, as envisioned in the approved RMAP.

Public Services

No amendments to the CEQA Guidelines Appendix G Environmental Checklist for Public Services have been adopted since circulation of the 2017 IS/MND. Further, no substantive changes to baseline public service conditions described in the IS/MND occurred in the time between circulation of the IS/MND and publication of the NOP for the DEIR in October 2019. This, combined with the determination that the Project would not induce unplanned population growth (see above), supports the 2017 IS/MND's determination of less-than-significant impact on public services and the decision not to address this issue further in the DEIR.

Recreation

No amendments to the CEQA Guidelines Appendix G Environmental Checklist for Recreation were adopted following circulation of the 2017 IS/MND. Further, no substantive changes in baseline conditions for recreation occurred in the time between circulation of the IS/MND and the DEIR NOP that would affect the analysis or conclusions presented in the 2017 IS/MND.

Utilities and Service Systems

CEQA Guidelines Appendix G Environmental Checklist items "a" and "c" for Utilities and Service Systems were eliminated from the Checklist since circulation of the 2017 IS/MND. Items "b", "d", "e", and "f" were amended after circulation of the IS/MND as follows:

~~b)~~ a) Require or result in the relocation or construction of new or expanded water, or wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities ~~or expansion of existing facilities~~, the construction or relocation of which could cause significant environmental effects?

~~d)~~ b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years ~~from existing entitlements and resources, or are new or expanded entitlements needed~~?

~~e)~~ 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?

~~f)~~ d) ~~Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?~~ Generate solid waste in excess of State or local standards or in excess of the capacity of local infrastructure?

e) Negatively impact the provision of solid waste services or impair the attainment of solid waste reduction goals?

~~g)~~ f) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The amendments shown above in items "a", "b", "c", "d", and "f", do not affect the analysis or conclusions presented in the 2017 IS/MND. Further, environmental baseline conditions pertaining to utilities and service systems did not substantively change in between circulation of the 2017 IS/MND and publication of the NOP for the DEIR in October 2019. For these reasons, the analysis of potential Project impact remains accurate and adequate to support the conclusion of less-than-significant impact for the Project.

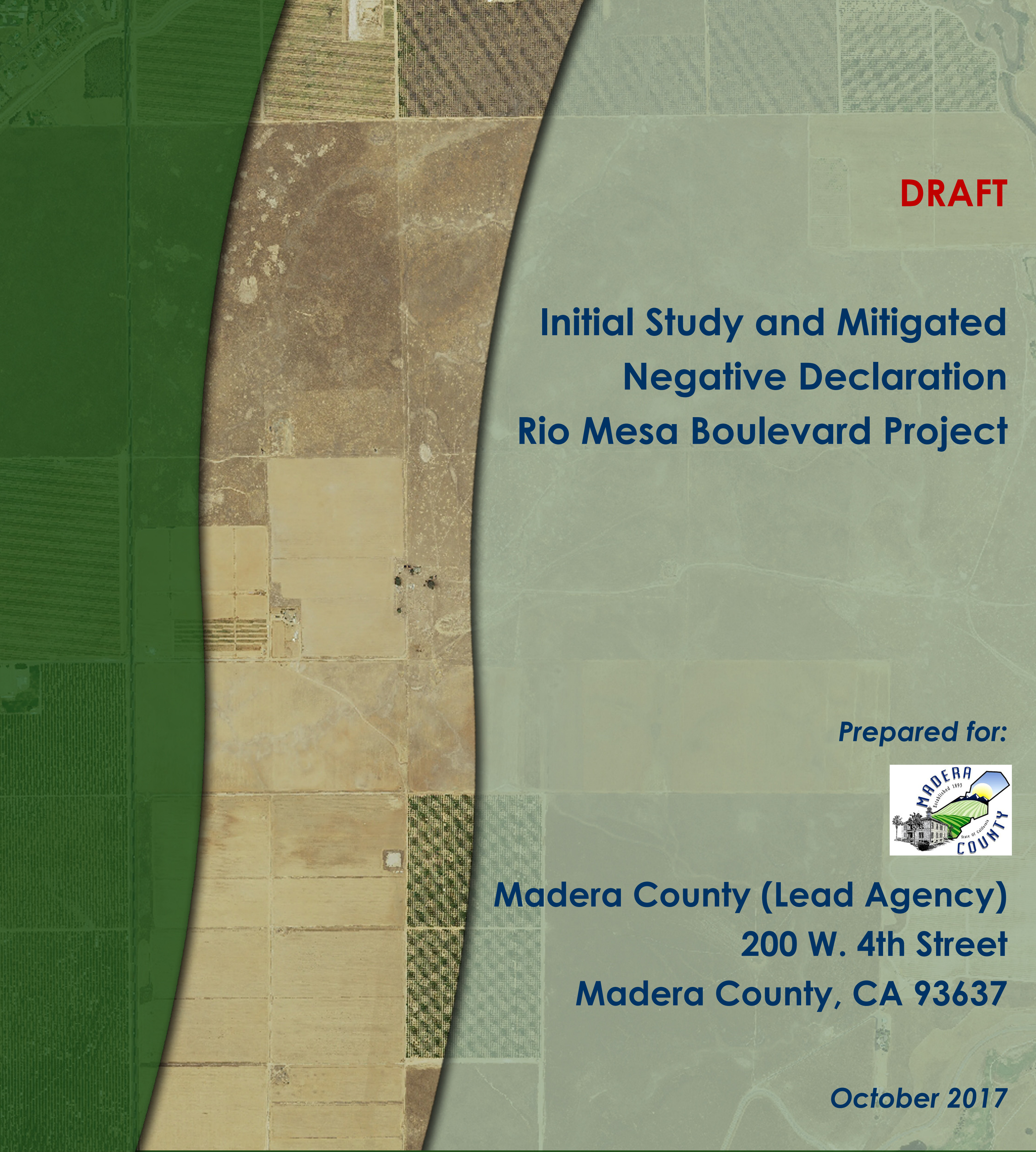
The potential Project's impact on solid waste handling during Project construction (refer to item e above) was addressed in the 2017 IS/MND but that discussion has been supplemented/updated as follows. The California Integrated Waste Management (CIWM) Act requires every county to adopt an integrated waste management plan that describes county objectives, policies, and programs relative to waste disposal, management, sources reduction, and recycling. The Solid Waste Management Section of the Madera County Engineering Services Division is responsible for ensuring that the disposal of solid waste due to construction activities will comply with all federal, state, and local statues and regulations. Project construction activities would not require the substantial demolition and disposal of existing infrastructure and the Project would not generate ongoing solid waste after completion. It is anticipated that construction-related waste generated by the Project would be disposed of at Fairmead Landfill. The Fairmead Landfill is permitted to serve the County through 2033. Solid waste generated by Project construction is not expected to exceed capacity of local solid waste infrastructure and is not expected to negatively affect the provision of solid waste services or impair attainment of solid waste reduction goals. Therefore, impacts associated with solid waste would be less than significant, consistent with the 2017 IS/MND findings.

Wildfire

Since circulation of the 2017 IS/MND, Section XX: Wildfire has been added to the CEQA Guidelines Appendix G Environmental Checklist. The potential for Project impact on the risk of wildfire is addressed in Section 4.1 of the DEIR.

APPENDIX A-2

A2 - 2017 2017 IS/MND for the Rio Mesa Draft EIR



DRAFT

Initial Study and Mitigated Negative Declaration
Rio Mesa Boulevard Project

Prepared for:

Madera County (Lead Agency)
200 W. 4th Street
Madera County, CA 93637

October 2017

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

DRAFT MITIGATED NEGATIVE DECLARATION
RIO MESA BOULEVARD PROJECT

Lead Agency: Madera County

Project Proponent: Madera County

Project Location: The Proposed Project is located within the Rio Mesa Area Plan, east of State Route 41, from Avenue 14 to Avenue 12 in Madera County, California (Figure 1. Project Location and Vicinity).

Project Description:

The Proposed Project would construct a new north-south roadway consistent with a secondary arterial (4-lane undivided) as depicted in (Figure 3. Site Plans). The proposed roadway would include: two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks between Avenue 12 and Avenue 14 (the southernmost portion of the Tesoro Viejo Development) (Figures 4a. and 4b. Typical Roadway Sections). The Proposed Project will also construct utility improvements for water, sewer, recycled water, fire hydrants, streetlights, drainage, roadway signage, and roadway striping.

Utility improvements include the following:

- 20,600 Linear Feet (LF) 12-inch water line,
- 22,000 LF eight-inch recycled water line,
- 13,200 LF eight-inch sewer force main, and
- 17,000 LF eight-inch and 10-inch gravity sewer lines.

Additionally, there will be storm drainage collection and conveyance facilities installed within the proposed right-of-way and dry utilities (i.e., electric, telephone, cable, fiber, and/or natural gas) that will be installed under the sidewalks in a joint trench. The average depth of utilities will be six feet, except the gravity sewer lines which will have an average depth of 18 feet, up to 25 feet deep. The proposed undivided roadway would provide a separated sidewalk with an eight-foot landscape planter for a separation between traffic and pedestrians. The Proposed Project would construct the following roadway segment lengths:

- Approximately 13,400 LF of Rio Mesa Boulevard from existing Avenue 12 to the south line of Tesoro Viejo;
- Approximately 1,300 LF of Flag Barn Way/Avenue 12 from existing SR-41 to Rio Mesa Boulevard;
- Approximately 4,400 LF of Avenue 14 to connect Rio Mesa Boulevard to Tesoro Viejo's Lyles Drive; and
- Approximately 2,700 LF of north-south collector roadway (Road A).

Public Review Period: October 23, 2017 – November 22, 2017

Mitigation Measures Incorporated into the Project to Avoid Significant Effects

Air Quality

Mitigation Measures

AQ-1: In accordance with SJVAPCD Rule 9510, the County of Madera shall ensure that a detailed air impact assessment (AIA) is prepared by the Project applicant detailing the specific construction requirements (i.e., equipment required, hours of use, etc.) associated with the proposed on-site improvements. In accordance with this rule, emissions of NO_X and PM_{10} from construction equipment used or associated with the development Project shall be reduced by 20 percent from baseline (unmitigated) emissions for NO_X and 45 percent from baseline (unmitigated) emissions for PM_{10}. The Project will demonstrate compliance with Rule 9510 before issuance of encroachment permit. To reduce short-term air quality impacts attributable to the Proposed Project consistent with Rule 9510, the following measures would likely be implemented:

- During all construction activities, all diesel-fueled construction equipment including, but not limited to, rubber-tired dozers, graders, scrapers, excavators, asphalt paving equipment, cranes, and tractors shall be California Air Resources Board (CARB) Tier 4 Certified or better as set forth in Section 2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 of the Code of Federal Regulations.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. Equipment maintenance records shall be kept on-site and made available upon request by the SJVAPCD or the County of Madera.
- The Project applicant shall comply with all applicable SJVAPCD rules and regulations. Copies of any applicable air quality permits and/or monitoring plans shall be provided to the County.

AQ-2: Madera County shall ensure that the following actions shall be implemented by the project applicant and maintained during construction by the project contractor in order to reduce the potential for exposure to valley fever during construction activities:

- Suspend work during period of high winds or dust storms.
- When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
- When digging a trench or fire line or performing other soil-disturbing tasks, position workers upwind when possible.
- When exposure to dust is unavoidable, require that workers wear NIOSH-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or HEPA.

AQ-3 To increase awareness to workers about the potential for valley fever, the following actions shall be required:

- Workers and supervisors shall be trained on:
  - Symptoms of valley fever.
  - Effective practices for preventing valley fever such as avoiding dust and working upwind of dust, using respirators when necessary.
  - Showering as soon as possible after work to limit exposure and transport of the fungal spores.
- The following CDPH materials on valley fever shall be distributed to all workers and supervisors:
  - CDPH pamphlet "*Preventing Work-Related Coccidioidomycosis (Valley Fever).*" Available at: http://www.cdph.ca.gov/HealthInfo/discond/Pages/Coccidioidomycosis.aspx.
  - CDPH Valley Fever Fact Sheet. Available at: http://www.cdph.ca.gov/HealthInfo/discond/Pages/Coccidioidomycosis.aspx.

Biological Resources

Mitigation Measures

BIO-1: Retain a qualified botanist to conduct guideline-level early season special-status plant surveys according to USFWS, CDFW, and CNPS protocols for all portions of the Study Area not included in the 2017 early season surveys. Surveys should be timed according to the blooming period for target species and known reference populations, if available, and/or local herbaria should be visited prior to surveys to confirm the appropriate phenological state of the target species. If the surveys determine the presence of listed species the following shall be implemented:

- Avoid special-status plants with appropriate avoidance buffers established in consultation with USFWS and/or CDFW;
- If avoidance is not obtainable, preserve suitable habitat at an off-site mitigation property; and
- If feasible, transplant, collect seeds, and/or inoculate wetlands with special-status plants that will be impacted Project implementation.

BIO-2: Succulent owl's clover was found in three vernal pools within the Study Area and San Joaquin Valley Orcutt grass was found in one vernal pool. Both are federally listed as threatened and state listed as endangered. Additionally, critical habitat for both these species is mapped within the Study Area. It is recommended to establish avoidance zones around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may vary between species and the specific avoidance zone distance will be determined in coordination with appropriate resource agencies (CDFW and USFWS). If plants cannot be avoided, take coverage from USFWS (under Sections 7 of the FESA) and/or take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required.

BIO-3: Obtain take coverage from USFWS under Section 7 of FESA, and preserve vernal pool fairy shrimp habitat (e.g., vernal pools and seasonal wetlands) at an off-site mitigation property at a ratio of 2:1 or as agreed upon through consultation with USFWS.

BIO-4: Obtain take coverage for California tiger salamander from USFWS under Section 7 or Section 10 of FESA and obtain take coverage for California tiger salamander from CDFW under Section 2081 of the California Fish and Game Code. In addition the following shall be implemented:

- Preserve in perpetuity suitable breeding habitat (e.g., vernal pools and seasonal wetlands) at an off-site mitigation property at a ratio of 2:1 or as agreed upon through consultation with USFWS and CDFW.
- Preserve in perpetuity suitable upland dispersal habitat (e.g., annual grassland within a vernal pool complex) at an off-site mitigation property at a ratio of 3:1 or as agreed upon through consultation with USFWS and CDFW.
- If suitable breeding habitat is ponded prior to initiation of construction activities, retain a qualified biologist to conduct pre-construction larval surveys for California tiger salamander and western spadefoot within the limits of construction to detect larvae prior to installation of the silt fence (see measure before). If California tiger salamander and/or western spadefoot are found, relocation to suitable breeding habitat will be conducted.
- Retain a qualified biologist to conduct burrow excavation and relocate adult California tiger salamanders and/or western spadefoots to suitable habitat.
- Install silt fences around the limits of construction to prevent California tiger salamander and/or western spadefoot from entering the Project area during construction; or
- Monitor the silt fence for trapped California tiger salamander and/or western spadefoots during the construction. If trapped spadefoots are found, relocation to suitable habitat will be conducted.

BIO-5: Retain a qualified biologist to conduct a pre-construction Blainville’s horned lizard survey 48 hours prior to construction activities. If Blainville’s horned lizards are found, implement the following measures:

- Establish silt fence around the entire impact area as required under MM__; and
- Retain a qualified biologist to relocate any Blainville’s horned lizards found within the fenced impact area prior to and during construction.

BIO 6: Retain a qualified biologist to conduct a pre-construction nesting raptor and bird survey of all suitable habitat on the Project site within 14 days of the commencement of construction during the nesting season (February 1 – August 31). Surveys should be conducted within 0.5 mile of the Project site for Swainson's hawk, 300 feet of the Project site for nesting raptors, including burrowing owl, and 100 feet of the Project site for nesting birds.

- If active nests are found, a no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist and are recommended to be 300 feet for raptors and 50 feet for non-raptor songbirds. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest tree, to be determined by a qualified biologist. Once the young are independent of the nest, no further measures are necessary. Pre-construction nesting surveys are not required for construction activity outside the nesting season.
- Retain a qualified biologist to conduct pre-construction surveys for American badger within 48 hours of construction activities and implement all applicable standard recommendations from the USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance (USFWS 2011).
- Retain a qualified biologist to conduct pre-construction roosting bat surveys for all suitable roosting habitat (i.e., trees) prior to construction activities. If suitable roosting habitat is identified, a qualified biologist will conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If pallid bats are found, consult with CDFW prior to initiation of construction activities and implement CDFW recommendations for bat protection. These may include but not be limited to establishing avoidance buffers from active roosts in consultation with CDFW.

BIO-9: Authorization to fill wetlands and other Waters of the U.S. under the Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Mitigation measures will be developed as part of the Section 404 Permit to ensure no-net-loss of wetland function and values. To facilitate such authorization, an application for a Section 404 Permit for the Project will be prepared and submitted to USACE and will include direct, avoided, and preserved acreages to Waters of the U.S. Mitigation for impacts to Waters of the U.S. would consist of a minimum of a 1:1 replacement ratio for direct impacts; however final mitigation requirements will be developed in consultation with USACE. These measures may include:

- Preservation of Waters of the U.S. in perpetuity at an off-site mitigation property;
- Purchase of mitigation credits at an Agency-approved mitigation bank; and/or
- Permittee-responsible mitigation (e.g., preservation and creation) at an off-site mitigation property.

BIO-10: Obtain a Water Quality Certification or waiver pursuant to Section 401 of the CWA from the RWQCB for Section 404 permit actions.

BIO-11: Construct wildlife crossings at selected locations through the Project road alignment to facilitate wildlife movement for special-status amphibians and reptiles. The crossings will consist of culverts constructed beneath roadways, the number and locations of which shall be determined in coordination with CDFW and USFWs through the Section 7 and Section 2081 processes described under Mitigation Measure BIO-3 and BIO-4.

Cultural Resources

Mitigation Measure

CR-1: If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, he or she shall immediately notify the applicable federal lead agency, the applicable CEQA lead agency, and applicable landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.

- If the find includes human remains, or remains that are potentially human, he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Madera County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California Public Resources Code, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (§ 5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the

MLD, the NAHC can mediate (§ 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate information center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

PA-1: If paleontological or other geologically sensitive resources be identified during any phase of project development, the construction manager shall cease operation at the site of the discovery and immediately notify the Madera County Community Development Department. The owner/applicant shall retain a qualified paleontologist to provide an evaluation of the find and to prescribe mitigation measures to reduce impacts to a less than significant level. In considering any suggested mitigation proposed by the consulting paleontologist, the Community Development Department shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, land use assumptions, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the project site while mitigation for paleontological resources is carried out.

Tribal Cultural Resources

Mitigation Measure

TCR-1: The project applicant shall retain the Dumna Wo-Wah Tribal Government or other applicable cultural resources specialists to observe and monitor all earth-moving, grading, boring, and sub-surface activities. Prior to issuance of a grading permit, evidence shall be provided for placement in the Project file that a Native American monitor has been retained. In the event that subsurface archaeological resources/human remains are encountered during the course of grading and/or excavation, all development shall temporarily cease in these areas until the archaeological resources are properly assessed and subsequent recommendations are determined by a qualified archaeologist. In the event that human remains are discovered, there shall be no disposition of such human remains, other than in accordance with the procedures and requirements set forth in California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. These code provisions require notification of the County Coroner and the Native American Heritage Commission, who in turn must notify those persons believed to be most likely descended from the deceased Native American for appropriate disposition of the remains. Excavation or disturbance may continue in other areas of the Project Site that are not reasonably suspected to overlie adjacent remains or archaeological resources. Copies of a subsequent archaeological study or report, detailing the nature of any archaeological discovery, remedial actions taken, and disposition of any accessioned remains shall be submitted to the Southern San Joaquin Valley Information Center at CSU Bakersfield.

TCR-2: ECORP will conduct one pre-construction meeting for construction personnel on the first day of construction, or within one week prior to the start of ground-disturbing activities, to review the potential for encountering archeological resources in the Project area, notification procedures if archaeological material is discovered, and coordination between construction personnel and agency staff.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
APE	Area of Potential Effects
APN	Assessor's Parcel Number
BMP	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CH_4	methane
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CRHR	California Register of Historical Resources
CWA	Clean Water Act
Db	Decibel
DPM	Diesel particulate matter
DTSC	State of California Department of Toxic Substances Control
EIR	Environmental Impact Report
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GHG	Greenhouse Gas
Ldn	Average noise level over a day
Leq	Equivalent continuous noise level
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MND	Mitigated Negative Declaration
Mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
ND	Negative Declaration
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide

NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
O_3	Ozone
Pb	Lead
PG&E	Pacific Gas & Electric Company
PD	Planned Development
PJD	Preliminary Jurisdictional Determination
PM_{10}	Particulate < 10 micrometers
$PM_{2.5}$	Particulate < 2.5 micrometers
PRC	Public Resources Code
RCRA	Resources Conservation and Recovery Act
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SMARA	Surface Mining and Reclamation Act
SMUD	Sacramento Municipal Utility District
SO_2	Sulfur dioxide
SOI	Sphere of Influence
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TIA	Traffic Impact Analysis
UCMP	University of California Museum of Paleontology
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USEPA	United States Environmental Protection Agency
WTP	Water Treatment Plant

SECTION 1. BACKGROUND

1.1 Summary

Project Title: Rio Mesa Boulevard Project

Lead Agency Name and Address: Madera County
200 W. 4th Street
Madera County, CA 93637

Contact Person and Phone Number: Jamie Bax, Senior Planner, Madera County, 559-675-7821

Project Location: The Proposed Project is located within Rio Mesa Area Plan, east of State Route 41, from Avenue 14 to Avenue 12 in Madera County, California.

General Plan Designation: Right-of-Way

Zoning: Right-of-Way (Agricultural)

1.2 Introduction

The Initial Study has been prepared to identify and assess the anticipated environmental impacts of the Rio Mesa Boulevard Project. This document has been prepared to satisfy the California Environmental Quality Act (CEQA) (Pub. Res. Code, Section 21000 *et seq.*) and State CEQA Guidelines (14 CCR 15000 *et seq.*). CEQA requires that all state and local government agencies consider the environmental consequences of Projects over which they have discretionary authority before acting on those Projects. A CEQA Initial Study is generally used to determine which type of CEQA document (e.g. Negative Declaration [ND], Mitigated Negative Declaration [MND], or Environmental Impact Report [EIR]) is appropriate for a Project.

This document is an Initial Study which concludes that a Mitigated Negative Declaration is the appropriate California Environmental Quality Act (CEQA) document for the Proposed Project). This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared in accordance with the California Environmental Quality Act, Public Resources Code Section 21000 et seq., and the State CEQA Guidelines, California Code of Regulations Section 15000 et seq.

An initial study is conducted by a lead agency to determine whether a project may have a significant effect on the environment. In accordance with CEQA Guidelines Section 15063, an environmental impact report (EIR) must be prepared if an initial study indicates that the proposed project under review may have a potentially significant impact on the environment which cannot be avoided or mitigated to a level that is less than significant. A negative declaration may be prepared if the lead agency also prepares a written statement describing the reasons why the proposed project would not have a significant effect on the environment and therefore why it does not require the preparation of an EIR (CEQA Guidelines Section 15371). Pursuant to CEQA Guidelines Section 15070, a negative declaration shall be prepared for a project subject to CEQA when either:

a) The initial study shows there is no substantial evidence, in light of the whole record before the agency, that the proposed project may have a significant effect on the environment, or

b) The initial study identifies potentially significant effects, but:

    (1) Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed negative declaration is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and

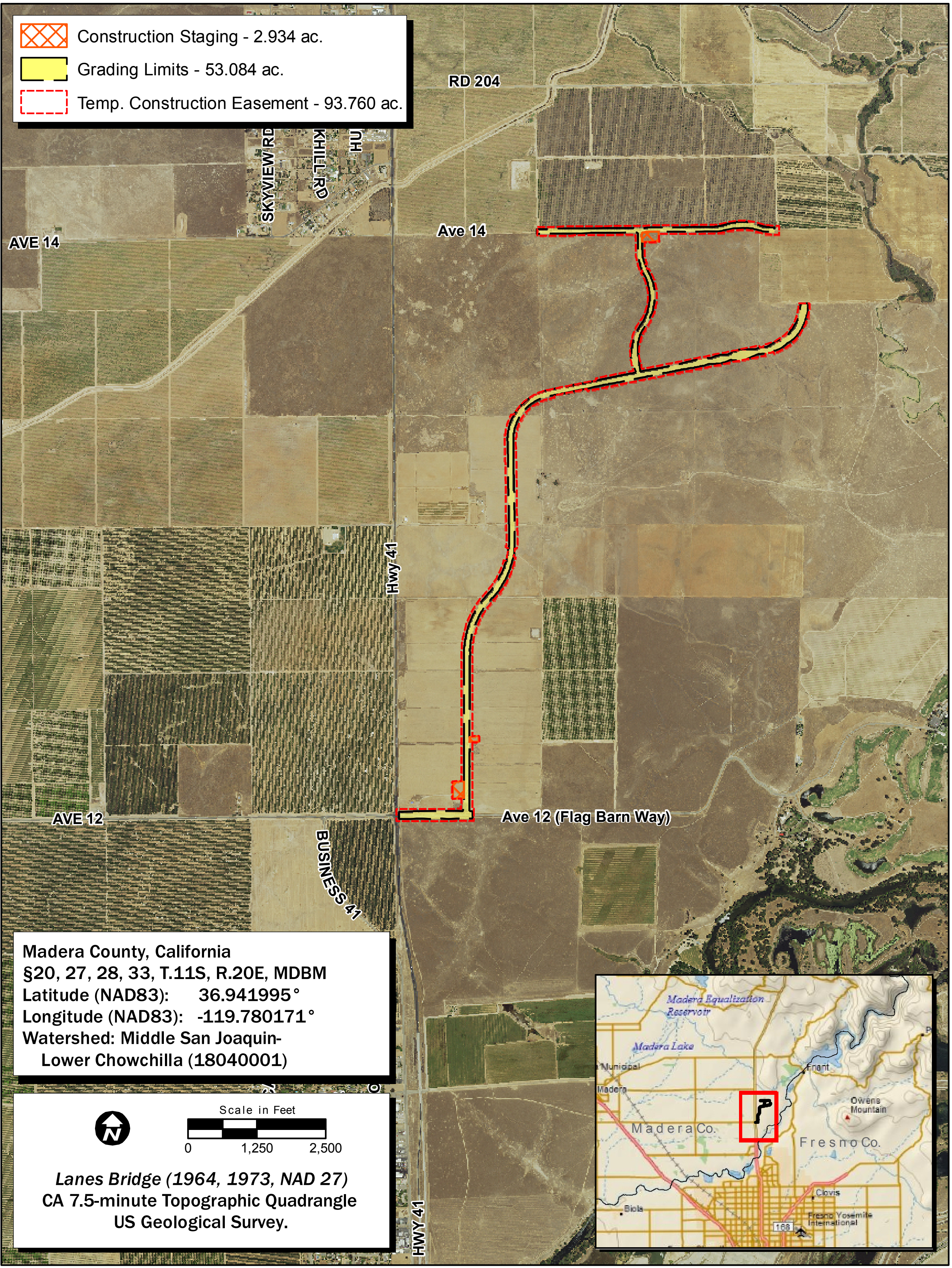
    (2) There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.

1.2 Lead Agency

The lead agency is the public agency with primary responsibility over a proposed project. Where two or more public agencies will be involved with a project, CEQA Guidelines Section 15051 provides criteria for identifying the lead agency. In accordance with CEQA Guidelines Section 15051(b)(1), “the lead agency will normally be the agency with general governmental powers, such as a city or county, rather than an agency with a single or limited purpose.” Based on the criteria above, the Madera County is the Lead Agency for this Initial Study.

1.3 Surrounding Land Uses/Environmental Setting

The Project is located east of State Route (SR-) 41, from Avenue 14 to Avenue 12 within the Rio Mesa Area Plan (Figure 1. Project Location and Vicinity). The Project is currently surrounded by open/undeveloped land with scattered orchards/crop lands. The Project area designated zoning is Low (LDR), Medium (MDR), and High (HDR) Density Residential land uses to the north, Light Industrial (LI), Very Low (VLR), Low (LDR), and Medium (MDR) Density Residential land uses to the east, Open Space (OS), Light Industrial (LI), and Highway Service Commercial (HSC) land uses to west, and Agricultural (A) and LDR land uses to the south (County of Madera 1995a). The general topography of the area is varied with a combination of hill and valley landforms. The Project Site is 93.7± acres and is zoned as Right of Way (Agricultural). Agricultural activities include grazing and ranching (Figure 2. Representative Site Photographs)



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Location_Vicinity\RMRA_LnV_V3.mxd (CCH)-chinkelman 10/2/2017

Map Date: 10/2/2017
Source Photo: NAIP 2014
Service Layer Credits: Copyright:© 2015 DeLorme

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Vicinity and Location

2017-089 Rio Mesa Boulevard Road Alignment

THIS PAGE INTENTIONALLY LEFT BLANK

Photo 1. Open space and grassland located within the northern portion of the project area, view east, 19 April 2017.

Photo 2. Open land with rolling hills in background located within northeastern portion of the project area, view west, 18 April 2017.

Photo 3. Vernal pool (will be avoided by project) located within central portion of the project area, view southwest, 18 April 2017.

Photo 4. Disked agricultural field located within southern portion of the project area, view south, 19 April 2017

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Representative Site Photographs

2017-089 Rio Mesa Boulevard

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2. PROJECT DESCRIPTION

2.1 Project Background

In 1995, the County of Madera (County) adopted the Rio Mesa Area Plan that includes the area located east of SR-41 and south of Road 145. The Rio Mesa Area Plan is a policy document intended to provide the County with land use development decision-making guidance, and to provide a planning framework for the development of more detailed implementation plans and measures.

The Proposed Project is part of the greater Rio Mesa Area Plan in southeastern Madera County. The Rio Mesa Area Plan envisions a multi-village concept establishing focal points for activity and land use master design. Within the Rio Mesa Area Plan are three approved large-scale residential development projects and various other sites that have been targeted for potential development. One of the approved projects is the Tesoro Viejo Development, which is currently under construction. This project borders SR-41 and is located approximately nine miles north of the City of Fresno and 13 miles east of the City of Madera. The Riverstone project is another large-scale residential development project that is also under construction and is also located on SR-41 in the southwest quadrant of the intersection with Avenue 12. Finally, the Gunner Ranch West project is getting ready to move to construction and is located on SR-41 just below the Riverstone project site. All three projects include some or all of the following: residential, commercial retail, office, highway commercial, visitor commercial, light industrial, and business park uses, in addition to open space and recreation uses, schools, and other institutional and public uses. The Proposed Project is designed to facilitate regional traffic flow generated by these projects and other traffic generators, thereby relieving pressure on SR-41.

To accommodate future build-out of the development contemplated by the Rio Mesa Area Plan, on September 22, 2015, the County Board of Supervisors adopted the Official Plan Line for Rio Mesa Boulevard from Avenue 12 to Avenue 14 and the Specific Plan Line for Flag Barn Way. The Official Plan Line was approved to establish the correct location of the road right-of-way for Rio Mesa Boulevard. It will provide for better regional circulation by creating a “loop” road connecting Avenue 12 and Avenue 15 through the Tesoro Viejo Development project, bypassing the increasingly heavily-traveled SR-41 segment in this area.

The Proposed Project includes installation of approximately 20,600 Linear Feet (LF) of 12-inch waterline, 22,000 LF of eight-inch recycled water line, 13,200 LF of eight-inch sewer force main, and 17,000 of eight-inch and 10-inch gravity sewer lines to allow conveyance of water and sewer service to the future Community Medical Center (CMC), planned for the northeastern quadrant of the Avenue 12/SR-41 intersection. Development plans for the CMC facility have not been submitted to the County for review nor is the County expecting to receive a development application in the foreseeable future. However, to avoid multiple disturbances to the Proposed Project’s right-of-way, it is more efficient and results in fewer environmental impacts to install all infrastructure in the right-of-way at the same time.

It should be noted that the SR-41 freeway alignment is currently under study by California Department of Transportation (Caltrans). The study will determine the final route alignment that will be adopted by Caltrans. Depending on final alignment decisions, a new interchange connection to SR-41 will likely occur at Avenue 12. However, any such interchange connection, yet to be finalized or proposed by Caltrans, is not part of this Proposed Project. It is intended for the Proposed Project to be constructed regardless of what decision Caltrans ultimately makes on whether to propose a new SR-41/Avenue 12 interchange.

2.2 Project Objectives

With increased development activities and interest in the area, the County is pursuing the development of Rio Mesa Boulevard to facilitate the orderly development of the greater Rio Mesa Plan area circulation system. The Project is needed to accommodate planned build-out, reduce associated congestion, and improve the future level of service and safety along SR-41. The existing congestion is caused by a combination of commuter, regional, and recreational traffic that use the existing two-lane state highway.

2.3 Project Details

The Proposed Project would construct a new north-south roadway consistent with a secondary arterial (4-lane undivided) as depicted in (Figure 3. Site Plans). The proposed roadway would include: two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks between Avenue 12 and Avenue 14 (the southernmost portion of the Tesoro Viejo Development) (Figures 4a. and 4b. Typical Roadway Sections). The Proposed Project will also construct utility improvements for water, sewer, recycled water, fire hydrants, streetlights, drainage, roadway signage, and roadway striping.

Utility improvements include the following:

- 20,600 LF 12-inch water line,
- 22,000 LF eight-inch recycled water line,
- 13,200 LF eight-inch sewer force main, and
- 17,000 LF eight-inch and 10-inch gravity sewer lines.

Additionally, there will be storm drainage collection and conveyance facilities installed within the proposed right-of-way and dry utilities (i.e., electric, telephone, cable, fiber, and/or natural gas) that will be installed under the sidewalks in a joint trench. The average depth of utilities will be six feet, except the gravity sewer lines which will have an average depth of 18 feet, up to 25 feet deep. The proposed undivided roadway would provide a separated sidewalk with an eight-foot landscape planter for a separation between traffic and pedestrians. The Proposed Project would construct the following roadway segment lengths:

- Approximately 13,400 LF of Rio Mesa Boulevard from existing Avenue 12 to the south line of Tesoro Viejo
- Approximately 1,300 LF of Flag Barn Way/Avenue 12 from existing SR-41 to Rio Mesa Boulevard

- Approximately 4,400 LF of Avenue 14 to connect Rio Mesa Boulevard to Tesoro Viejo's Lyles Drive, and
- Approximately 2,700 LF of north-south collector roadway (Road A).

2.4 Staging Areas

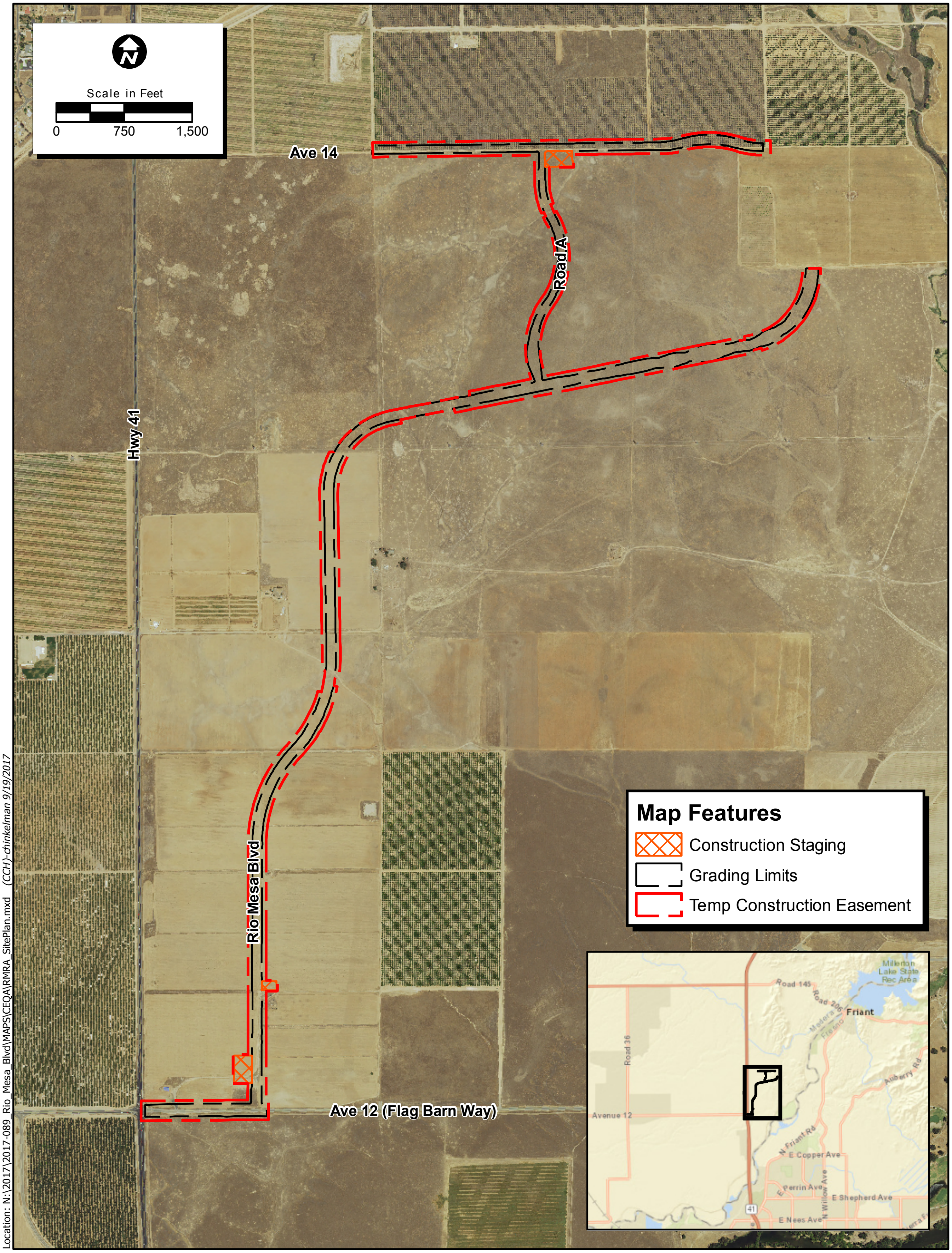
The Proposed Project includes three construction staging areas, totaling 3± acres, which will be located within the 93.7± acre project footprint with access from Avenue 12 and Avenue 14. See Figure 3 for staging area locations.

2.5 Construction Timing and Phasing

Construction of the Proposed Project will be split into two phases and will take approximately eight years for complete build-out. The initial phase (Phase 1) of construction is expected to start in spring 2020 and take approximately five months to complete. Phase 1 will consist of two 12-foot travel lanes, four-foot shoulders, domestic water pipeline, recycled water pipeline, sanitary sewer pipeline, sanitary sewer force main, and roadway drainage facilities. Phase 2 will occur as properties develop within the Rio Mesa Plan area. Adjacent development will be required to complete their frontage improvements, consisting of one additional 12-foot travel lane, six-foot-wide bike path, curbs, gutter, sidewalk, streetlighting, and frontage landscape improvements. Phase 2 is expected to start in spring 2024. The completion of Phase 2 improvements will depend on how fast the surrounding development occurs. Construction activities will include use of the following equipment:

- Excavators
- Graders
- Rubber-tired dozers
- Scrapers
- Tractors/Loaders/Backhoes
- Rollers
- Surfacing equipment
- Trenchers
- Pavers

THIS PAGE INTENTIONALLY LEFT BLANK



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\CEQA\RMRA_SitePlan.mxd (CCH)-chinkelman 9/19/2017

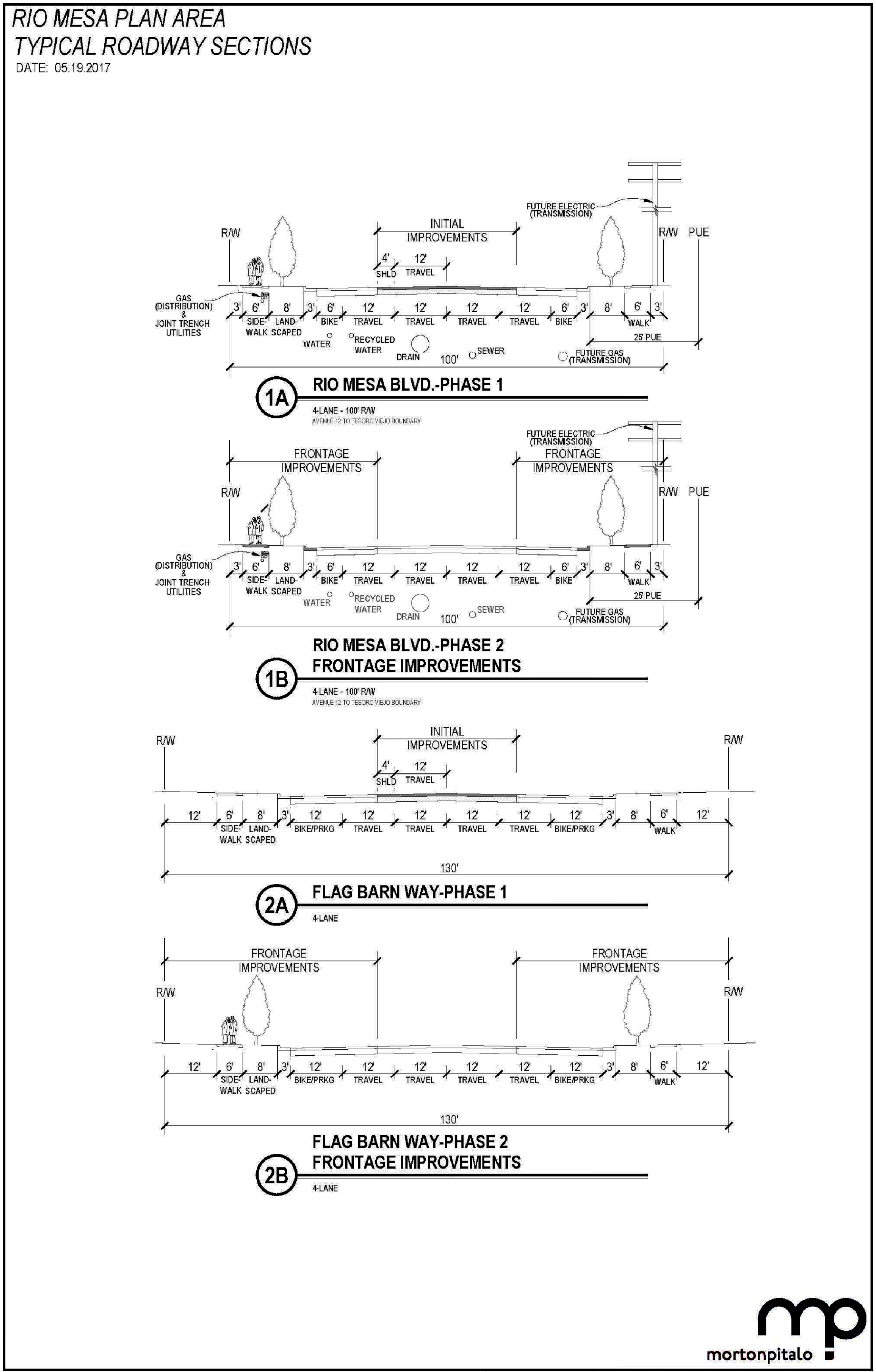
Map Date: 9/18/2017
Photo Source: NAIP 2014
Service Layer Credits: Copyright: ©2015 DeLorme

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 3. Site Plan

2017-089 Rio Mesa Boulevard Road Alignment

THIS PAGE INTENTIONALLY LEFT BLANK



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\CEQA\RMBA_TypSection4a.mxd (CCH)-chinkelman 9/14/2017

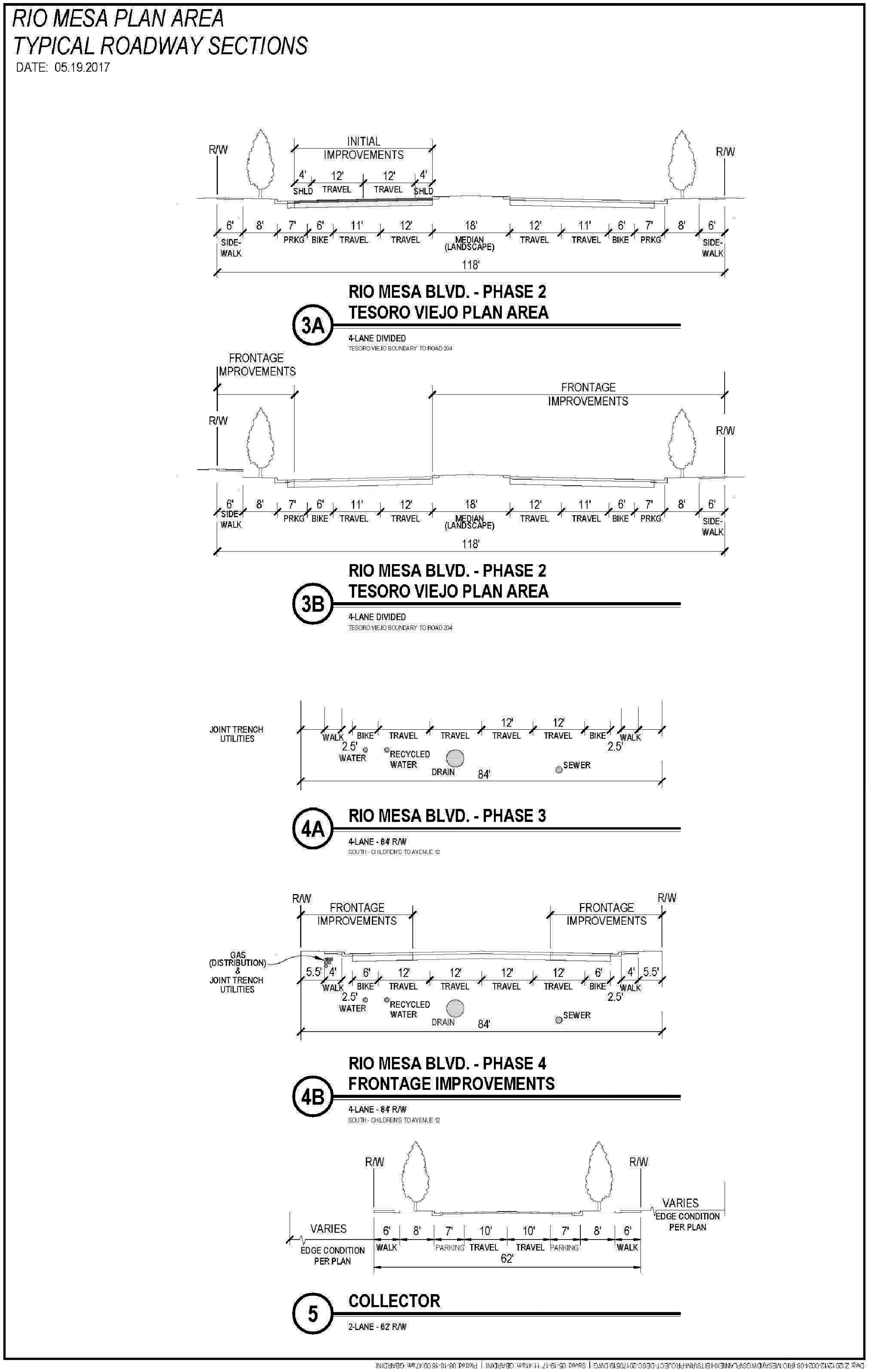
Map Date: 9/14/2017
Source: Morton Pitalo 05-19-2017

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4a. Typical Roadway Section

2017-089 Rio Mesa Boulevard Road Alignment

THIS PAGE INTENTIONALLY LEFT BLANK



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\CEQA\RMRA_TypSection4b.mxd (CCH)-chinkelman 9/18/2017

Map Date: 9/18/2017
Source: Morton Pitalo 05-19-2017

Figure 4b. Typical Roadway Section

2017-089 Rio Mesa Boulevard Road Alignment

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

THIS PAGE INTENTIONALLY LEFT BLANK

2.5 Regulatory Requirements, Permits, and Approvals

This Initial Study provides the environmental information and analysis and primary CEQA documentation necessary for Madera County to adequately consider the effects of the proposed construction project. Madera County, as lead agency, has the approval authority and responsibility for considering the environmental effects of the Proposed Project.

The following approvals and regulatory permits would be required for implementation of the Proposed Project.

Table 2.1. Regulatory Requirements, Permits, and Approvals

Organization or Issue	Approval or Permit
Madera County	Encroachment Permit for roadway improvements.
U.S. Army Corps of Engineers	Section 404 – Permit
Regional Water Quality Control Board	401 Certification
U.S Fish and Wildlife Service	Section 7 Consultation
California Department of Fish and Wildlife	Incidental Take Permit 2018
State Water Resources Control Board	General Permit Order 2009-0009-DWQ, Storm Water Pollution Prevention Plan, and Best Management Practices

2.6 Consultation With California Native American Tribe(s)

The following California Native American tribes traditionally and culturally affiliated with the project area have been notified of the project: The Dumna Wo-Wah Tribal Government. The Dumna Wo-Wah Tribal Government have requested general information pursuant to Public Resources Code section 21080.3.1. A summary of the consultation process is provided in Section 4.18 of this Initial Study.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

Environmental Factors Potentially Affected

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

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

Determination

On the basis of this initial evaluation:

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

I find that although the Project could have a significant effect 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 Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☐

I find that the 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 the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ☐

I find that although the 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 Project, nothing further is required. ☐

____________________________________ ________________________
Mathew Treber, Director, Madera County Date

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4. ENVIRONMENTAL CHECKLIST AND DISCUSSION

4.1 Aesthetics

4.1.1 Environmental Setting

Regional Setting

The Rio Mesa Planning Area (Rio Mesa) encompasses approximately 15,000 acres within Madera County. Rio Mesa is located 16 miles east of the City of Madera, 30 miles west of the Sierra Nevada foothills, and 15 miles north from the center of the City of Fresno. This area is generally characterized as undeveloped gently rolling land used for grazing, agricultural, and ranching purposes.

<u>State Scenic Highways</u>

The California Scenic Highway Program protects and enhances the scenic beauty of California's highways and adjacent corridors. A highway can be designated as scenic based on how much natural beauty can be seen by users of the highway, the quality of the scenic landscape, and if development impacts the enjoyment of the view. State Route 41 and 49 located approximately 25 miles north of Rio Mesa are designated as Eligible State Scenic Highways – Not Officially Designated by the California Department of Transportation (Caltrans 2017).

Visual Setting

Rio Mesa is characterized by its natural features and abundance of open space. The general topography of the area is varied with a combination of hill and valley landforms, providing panoramic views of the San Joaquin River to the east and scenic views of Little Table Mountain to the north. The project area mainly consists of agricultural land bounded by State Route 41 to the west and the San Joaquin River to the east. The Proposed Project is located within the Rio Mesa Area Plan and is surrounded by property designated as Low (LDR), Medium (MDR), and High (HDR) Density Residential to the north, Very Low (VLR), Low (LDR), and Medium (MDR) Density Residential to the east, Open Space (OS), Light Industrial (LI), and Highway Service Commercial (HSC) to west, and Light Industrial (LI) l to the south (County of Madera 1995a).

4.1.2 Aesthetics (I.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒

Discussion:

The Rio Mesa Area Plan acknowledges the value of natural resources as well as the challenge of preserving these resources with the introduction of new development. The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa. The project site is located within existing agricultural land and surrounded by the San Joaquin River, State Route 41, and industrial, residential, and commercial designated land (County of Madera 1995a). Due to the nature of the Proposed Project scenic views of the San Joaquin River and Little Table Mountain would not be affected. No impact would occur.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The Proposed Project is located approximately 25 miles south of the junction of State Route (SR) 41 and (SR) 49. The segment or SR 41 and SR 49 north of this junction is designated as Eligible State Scenic Highways – Not Officially Designated by the California Department of Transportation (Caltrans 2017). The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa. The project area is currently surrounded by agricultural land, no trees or rock outcrops would be damaged. The proposed roadway alignment would avoid structures within the project area. No impact would occur.

c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa. The Proposed Project is needed to reduce congestion, improve future Level of Service (LOS), and safety along State Route 41, an existing two-lane state highway. The resulting visual character of the project site would be consistent with the Rio Mesa Area Plan. Due to the nature of the Proposed Project, it would not substantially degrade the existing character or quality of the site and its surroundings. A less than significant impact would occur. No mitigation is required.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion:

The Proposed Project would include street lighting as part of its utility improvements. Lighting would be limited to traffic signals at intersections and street lighting on both sides of the proposed roadway. However, street lights would be directed onto the roadway to minimize overspill and glare to adjacent properties. Lighting intensity and glare produced by these fixtures would be similar to street light fixtures within adjacent development. Therefore, the Proposed Project would not introduce a new source of substantial light or glare that would adversely affect day or nighttime views in the area. A less than significant impact would occur. No mitigation is required.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.2 Agriculture and Forestry Resources

4.2.1 Environmental Setting

The project site is located within an Agricultural Rural Valley (County of Madera 2017). The project site is not located on Prime Farmland nor is it located under a Williamson Act contract (CDC 2017; 2015). There are no local policies for agricultural resources that apply to the project site.

According to the California Farmland Mapping and Monitoring Program (FMMP) map for Madera County, the project site is not located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (CDC 2017).

4.2.2 Agriculture and Forestry Resources (II.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project 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?	☐	☐	☐	☒

Discussion:

The Proposed Project alignment transects several parcels; however, none of them are designated as on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (CDC 2017). Therefore, no impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

Discussion:

According to the Madera County online GIS database, the project site is located within an Agricultural Rural Valley – 20 Acres (ARV-20) and Agriculture Rural Exclusive (ARE-40) zoning district (County of Madera 2017). However, no lands within the project site are under a Williamson Act Contract. The Proposed Project would construct a secondary arterial (4-lane undivided) roadway within Rio Mesa east of State Route 41, between Avenue 14 and 12. The Proposed Project would be consistent with the Rio Mesa Area Plan; therefore, no impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Would the project 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))?				

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Would the project 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))?	☐	☐	☐	☒

Discussion:

The Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned production. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion:

The Proposed Project would construct a secondary arterial (4-lane undivided) roadway within Rio Mesa east of State Route 41, between Avenue 14 and 12. The Proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion:

The Proposed Project would construct a secondary arterial (4-lane undivided) roadway within Rio Mesa east of State Route 41, between Avenue 14 and 12. Due to the nature and location of the Proposed Project, it would not result in the conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.3 Air Quality

An evaluation of Air Quality and CalEEMod version 2016.3.1 modeling was prepared by ECORP and is presented in the following discussion. See Appendix A for emission model outputs.

4.3.1 Environmental Setting

The Project site is located in Madera County, which is a part of the San Joaquin Valley Air Basin (SJVAB). The SJVAB occupies the southern two-thirds of the Central Valley and, in addition to Madera County, also includes the counties of San Joaquin, Stanislaus, Merced, Fresno, Kings, Tulare and the Central Valley portion of Kern. The SJVAB is mostly flat, less than 1,000 feet in elevation, and is surrounded on three sides by the Sierra Nevada, Tehachapi, and Coast Range mountains. This bowl-shaped feature forms a natural barrier to the dispersion (spreading over an area) of air pollutants. As a result, the SJVAB is highly susceptible to pollutant accumulation over time (SJVAPCD 2002).

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants representing safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called “criteria” pollutants because the health and other effects of each pollutant are described in criteria documents. The six criteria pollutants are ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and lead. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. The Madera County portion of the SJVAB is designated as a nonattainment area for O_3, coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) for state standards and O_3 and $PM_{2.5}$ for federal standards (CARB 2016).

In the County, the air quality regulating authority is the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD monitors air quality in the county and serves as the lead agency responsible for implementing and enforcing federal, state, and Madera County air quality regulations.

4.3.2 Air Quality (III.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

Discussion:

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The SJVAPCD prepared the 2004 Extreme Ozone Attainment Demonstration Plan and 2013 Plan for the Revoked 1-Hour Ozone Standard, 2007 Ozone Plan, 2009 Reasonably Available Control Technology Demonstration for Ozone State Implementation Plan, 2016 Plan for the 2008 8-Hour Ozone Standard, 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard, and 2007 PM_{10} Maintenance Plan and Request for Redesignation. These plans collectively address the air basin's nonattainment status with the national and state ozone standards as well as particulate matter by establishing a program of rules and regulations directed at reducing air pollutant emissions and achieving state (California) and national air quality standards. Pollutant control strategies are based on the latest scientific and technical information and planning assumptions, updated emission inventory methodologies for various source categories, and the latest population growth projections and associated vehicle miles traveled projections for the region. SJVAPCD's latest population growth forecasts were defined in consultation with local governments and with reference to local general plans.

The Proposed Project is part of the Rio Mesa Area Plan (Circulation Concept Plan) which has been planned and approved since 1995. The Rio Mesa Area Plan was envisioned in the 1994 Madera County General Plan Update for phased urban development over the next ten to twenty years, though much development has yet to occur. Within the Rio Mesa Area Plan are three approved large-scale residential development projects and the Proposed Project has been designed to accommodate these approved developments as well as provide congestion relief for other areas in the vicinity already under construction. As stated in Section 4.14, *Population and Housing*, the Proposed Project is not anticipated to directly or indirectly induce population growth in the area. Furthermore, the Proposed Project is consistent with the Madera County General Plan. Therefore, the Project would not exceed the population or job growth projections used by the SJVAPCD to develop its air quality attainment plans. There is no impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐

Discussion:

Short-Term Construction Impacts

Construction of Phase 1 of the proposed Project is anticipated to commence in March 2020 and be completed in September 2020. Construction of Phase 2 of the Proposed Project is anticipated to commence in March 2024 and be completed in September 2024. Construction associated with the Proposed Project would generate short-term emissions of criteria air pollutants, including reactive organic compounds (ROG), CO, NO_X, SO_2, coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). The largest amount of ROG, CO, and NO_X emissions would occur during the earthwork phase. PM_{10} and $PM_{2.5}$ emissions would occur from fugitive dust (due to earthwork and excavation) and from construction equipment exhaust. Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the Project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact.

During construction activities, the Project would also be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions). The purpose of this rule is to limit airborne particulate emissions associated with construction, demolition, excavation, extraction, and other earthmoving activities, as well as with open disturbed land and emissions associated with paved and unpaved roads. Accordingly, these rules include specific measures to be employed to prevent and reduce fugitive dust emissions from anthropogenic sources. For instance, the Project applicant would be required to prepare a dust control plan, to the satisfaction of SJVAPCD requirements, and adhere to it. Construction activities anywhere within the regulatory jurisdiction of the SJVAPCD, including the Proposed Project site, may not commence until the SJVAPCD has approved or conditionally approved the dust control plan, which must describe all fugitive dust control measures that are to be implemented before, during, and after any dust-generating activity. Regulation VIII specifies the following measures to control fugitive dust:

- Apply water to unpaved surfaces and areas.
- Use nontoxic chemical or organic dust suppressants on unpaved roads and traffic areas.
- Limit or reduce vehicle speed on unpaved roads and traffic areas to a maximum 15 miles per hour.
- Maintain areas in a stabilized condition by restricting vehicle access.
- Install wind barriers.
- During high winds, cease outdoor activities that disturb the soil.
- Keep bulk materials sufficiently wet when handling.
- Store and handle materials in a three-sided structure.
- When storing bulk materials, apply water to the surface or cover the storage pile with a tarp.
- Don’t overload haul trucks. Overloaded trucks are likely to spill bulk materials.

- Cover haul trucks with a tarp or other suitable cover. Or, wet the top of the load enough to limit visible dust emissions.
- Clean the interior of cargo compartments on emptied haul trucks prior to leaving a site.
- Prevent trackout by installing a trackout control device.
- Clean up trackout at least once a day. If along a busy road or highway, clean up trackout immediately.
- Monitor dust-generating activities and implement appropriate measures for maximum dust control.

The SJVAPCD's (2015) Guidance for Assessing and Mitigation Air Quality Impacts identifies significance thresholds for ROG, CO, and NO_X, SO_2, PM_{10}, and $PM_{2.5}$. Construction-generated ozone precursor emissions associated with the Proposed Project were calculated using CalEEMod. Predicted maximum annual construction-generated emissions of criteria air pollutants for the Proposed Project are summarized in **Table 4.3-1**.

Table 4.3-1. Unmitigated Construction-Related Criteria Pollutant Emissions (Maximum Tons per Year)

Construction Activities	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2020	1.67	9.32	7.50	0.02	1.69	0.74
Year 2024	0.84	6.14	5.83	0.02	1.57	0.62
SJVAPCD Potentially Significant Impact Threshold	10	10	100	27	15	15
Exceed SJVAPCD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2016.3.1. See ***Appendix A*** *for emission model outputs.*

As shown in **Table 4.3-1**, construction-generated emissions would not exceed SJVAPCD significance thresholds.

In addition to the SJVAPCD criteria air pollutant thresholds, SJVAPCD Rule 9510, Indirect Source Review, aims to fulfill the District's emission reduction commitments in the PM_{10} and Ozone Attainment Plans. This rule applies to the following construction projects within the jurisdiction of the SJVAPCD:

- 50 residential units
- 2,000 square feet of commercial space
- 25,000 square feet of light industrial space
- 100,000 square feet of heavy industrial space
- 20,000 square feet of medical office space
- 39,000 square feet of general office space
- 9,000 square feet of educational space
- 10,000 square feet of government space

- 20,000 square feet of recreational space; or
- 9,000 square feet of space not identified above.

This rule also applies to any transportation or transit project where construction exhaust emissions equal or exceed two tons of NO_x or two tons of PM_{10}.

The Proposed Project is considered a transportation project, and as shown in **Table 4.3-1**, construction activities would generate NO_X exhaust emissions of more than 2 tons, thus instigating the implementation of SJVAPCD Rule 9510 and the requirement to reduce NO_X exhaust emissions from the Project's baseline by 20 percent and reduce PM_{10} exhaust emissions from the Project's baseline by 45 percent. In accordance with Rule 9510, the Project applicant is required to prepare a detailed air impact assessment (AIA) for submittal to the SJVAPCD, which demonstrates the reduction of NO_X emissions from the Project's baselines by 20 percent. Therefore, mitigation measure **AQ-1** is required. This mitigation requires the preparation of a detailed AIA. The AIA must demonstrate how emissions of NO_X and PM_{10} from construction equipment used or associated with the transportation Project will be reduced by 20 percent from baseline (unmitigated) emissions for NO_X and 45 percent from baseline (unmitigated) emissions for PM_{10}. The most likely manner to achieve this reduction includes the use of off-road construction equipment manufactured to Tier 4 standards. Tier 4 engines are engines outfitted with a variety of recently engineered exhaust after-treatment components.

Implementation of mitigation measure **AQ-1** would substantially reduce impacts resulting from NO_X emissions associated with Project construction as shown in **Table 4.3-2.**

Table 4.3-2. Mitigated Construction-Related Criteria Pollutant Emissions

Construction Activities exhaust	NO_X exhaust	PM_{10} exhaust
Year 2020		
Baseline Emissions (Maximum Tons per Year)	9.32	0.30
Mitigated Emissions (Maximum Tons per Year)	3.67	0.03
Percent Reduction	**60.65%**	**88.79%**
Rule 9510 Percent Reduction Requirement	20%	45%
Achieve SJVAPCD Reduction Standard?	**Yes**	**Yes**
Year 2024		
Baseline Emissions (Maximum Tons per Year)	6.14	0.18
Mitigated Emissions (Maximum Tons per Year)	2.56	0.02
Percent Reduction	**58.41%**	**89.19%**
Rule 9510 Percent Reduction Requirement	20%	45%
Achieve SJVAPCD Reduction Standard?	**Yes**	**Yes**

Source: CalEEMod version 2016.3.1. See ***Appendix A*** *for emission model outputs.*

As shown in **Table 4.3-2,** the employment of the specified off-road construction equipment manufactured to Tier 4 standards would result in a 60.65 percent reduction of NO_X from baseline in the year 2020 and a 58.41 percent reduction of NO_X from baseline in the year 2024. Tier 4 standards or higher would also result in an 88.79 percent reduction of PM_{10} from baseline in the year 2020 and an 89.19 percent reduction of PM_{10} from baseline in the year 2024. The mitigated emissions from NO_X and PM_{10} meet the SJVAPCD Rule 9510 reduction targets of 20 percent for NO_X and 45 percent for PM_{10}.

Since Project construction would not exceed SJVAPCD significance thresholds and would also comply with SJVAPCD Rule 9510, construction-related air quality impacts are less than significant with mitigation.

Long-Term Operational Impacts

None of the components of the Proposed Project would include the provision of new permanent stationary or mobile sources of emissions. Therefore, by its nature, the Project would not generate quantifiable criteria emissions from long-term operations. The Project does not propose any new buildings and therefore no permanent source of stationary source emissions. In addition, once completed the Project would not result in a permanent increase in traffic. The Proposed Project would accommodate existing and predicted traffic demands and uphold Madera County's goals to reduce traffic congestion, improve safety on roadways, and provide better access to regional transportation routes. The Proposed Project is part of the Rio Mesa Area Plan (Circulation Concept Plan) which has been planned and approved since 1995. The Rio Mesa Area Plan was envisioned in the 1994 Madera County General Plan Update for phased urban development over the next ten to twenty years, though much development has yet to occur. Within the Rio Mesa Area Plan are three approved large-scale residential development projects and the Proposed Project has been designed to accommodate these approved developments as well as provide congestion relief for other areas in the vicinity already under construction.

Since the Project would be designed to accommodate additional traffic volumes and would not directly generate new traffic or increase vehicular trips, a source of air pollutants, the Proposed Project would not exceed SJVAQMD thresholds of significance resulting in a less than significant impact.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

Discussion:

The SJVAPCD's approach to assessing cumulative impacts is based, in part, on the projected increases in emissions attributable to the Proposed Project, as well as the Project's consistency with the air district's air quality attainment plans. In other words, the SJVAPCD considers the impact of a project to be less than cumulatively considerable if it does not exceed significance thresholds under project-level conditions and does not conflict with the SJVAPCD's air quality plans. As identified under Issue a), the Project would not conflict with any SJVAPCD air quality plans. Additionally, as discussed under Issue b), the Project would not exceed SJVAPCD construction or operational significance thresholds with the imposition of mitigation. Therefore, impacts in this regard would be less than significant.

d) Would the project expose sensitive receptors to substantial pollutant concentrations?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☒	☐	☐

Discussion:

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. The California Air Resources Board (CARB) has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. Sensitive receptors closest to the Project site include a residence located approximately 550 feet west of the central portion of the Project area. (While there is a single residential structure located to the east of the central portion of the Project area, this structure is uninhabitable.)

Short-Term Construction Impacts

Construction Equipment

Construction-related activities would result in temporary, short-term Project-generated emissions of diesel particulate matter (DPM) from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., clearing, grading); soil hauling truck traffic; paving; application of architectural coatings; and other miscellaneous activities. For construction activity, DPM is the primary toxic air contaminant (TAC) of concern. Particulate exhaust emissions from diesel-fueled engines (i.e., DPM) were identified as a TAC by the CARB in 1998. The potential cancer risk from the inhalation of DPM, as discussed below, outweighs the potential for all other health impacts (i.e., non-cancer chronic risk, short-term acute risk) and health impacts from other TACs. Accordingly, DPM is the focus of this discussion.

Based on the emission modeling conducted and presented in **Table 4.3-1**, above, the maximum construction-related annual emissions of $PM_{2.5}$, considered a surrogate for DPM, would be 0.74 tons/year during construction activity. ($PM_{2.5}$ is considered a surrogate for DPM because more than 90 percent of DPM is less than 1 microgram in diameter and therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$), according to CARB. Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles.) Even during the most intense month of construction, emissions of DPM would be generated from different locations on the Project site, rather than a single location, because different types of construction activities (e.g., site preparation, roadway construction) would not occur at the same place at the same time.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70- or 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project. Consequently, an important consideration is that the use of off-road heavy-duty diesel equipment would be limited to the periods of construction, for which most diesel-powered off-road equipment use would occur only over a 5-month period for Phase 1 of the Project and a 5-month period for Phase 2 of the Project. It is also important to consider the proximity of nearby sensitive receptors. Studies show that DPM is highly dispersive (as an example, DPM concentrations decrease by 70 percent at 500 feet from the source), and receptors must be in close proximity to emission sources in order to result in the possibility of exposure to concentrations of concern (CARB 2005). As previously described, sensitive receptors closest to the Project site include a residence located more than 500 feet west of the central portion of the Project area. Given the large distance of potential receptors relative to potential DPM emission sources and the temporary nature of construction activities, the concentrations and durations of any TAC exposure that might occur would be very limited. Therefore, considering the relatively low mass of DPM emissions that would be generated during even the most intense season of construction, the relatively short duration of construction activities seasonally and overall, the distance to the nearest offsite sensitive receptors, and the highly dispersive properties of DPM, construction-related TAC emissions would not expose sensitive receptors to substantial amounts of air toxics.

Naturally Occurring Asbestos

Another potential air quality issue associated with construction-related activities is the airborne entrainment of asbestos due to the disturbance of naturally-occurring asbestos-containing soils. The Proposed Project is not located within an area designated by the State of California as likely to contain naturally-occurring asbestos (DOC 2000). As a result, construction-related activities would not be anticipated to result in increased exposure of sensitive land uses to asbestos.

Valley Fever

Valley fever (*Coccidioidomycosis*) is found in California, including Madera County. In about 50 to 75 percent of people, valley fever causes either no symptoms or mild symptoms and those infected never seek medical care; when symptoms are more pronounced, they usually present as lung problems (cough, shortness of breath, sputum production, fever, and chest pains). The disease can progress to chronic or progressive lung disease and may even become disseminated to the skin, lining tissue of the brain (meninges), skeleton, and other body areas.

The California Department of Public Health (2017) considers Madera County a highly endemic area for valley fever. When soil containing this fungus is disturbed by construction activities such as digging or grading, by vehicles raising dust, or by the wind, the fungal spores get into the air. When people breathe the spores into their lungs, they may get valley fever. Fungal spores are small particles that can grow and reproduce in the body. The highest infection period for valley fever occurs during the dry months in California between June and November. Infection from valley fever during construction can be partially mitigated through the control of construction-generated dust. As noted, construction-generated dust would be controlled by adhering to the mandatory requirements contained in SJVAPCD Regulation VIII, which include the preparation of a SJVAPCD-approved dust control plan describing all fugitive dust control measures that are to be implemented before, during, and after any dust-generating activity. In addition, the California Department of Public Health provides recommendations for reducing the potential for valley fever infection during construction activities. These recommendations are required as mitigation measures **AQ-2** and **AQ-3**.

Long-Term Operational Impacts

Vehicular Traffic on Rio Mesa Boulevard

In 2005, CARB published an informational guide entitled *Air Quality and Land Use Handbook: A Community Health Perspective*. The handbook's purpose is to provide information to aid local jurisdictions in addressing issues and concerns related to the placement of sensitive land uses near major sources of air pollution, and vice versa. The handbook includes recommended separation distances for various land uses. Of pertinence to this study, CARB guidelines indicate that siting sensitive land uses and transportation facilities accommodating more than 100,000 vehicle trips daily within 500 feet of one another should be avoided when possible. This 500-foot buffer was developed to protect sensitive receptors from exposure to diesel PM and was based on traffic-related studies that showed a 70 percent drop in PM concentrations at a distance of 500 feet from the roadway. Presumably, acute and chronic risks as well as lifetime cancer risk due to diesel PM exposure are lowered proportionately.

Sensitive receptors closest to the Project site include a residence located approximately 550 feet west of the central portion of the Project area. Therefore, while the nearest segment of Rio Mesa Boulevard is not anticipated to accommodate 100,000 vehicle trips daily, it is also beyond the CARB-recommended 500-foot buffer. Therefore, the Project would not result in the exposure of sensitive receptors to substantial concentrations of TACs.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the CO standard in California is a maximum of 3.4 grams per mile for passenger cars (requirements for certain vehicles are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the Project vicinity have steadily declined.

Accordingly, with the steadily decreasing CO emissions from vehicles, even very busy intersections do not result in exceedances of the CO standard. Furthermore, the Proposed Project has been designed to provide congestion relief and would not generate new vehicle trips. The project would reduce congestion and improve traffic flow. Therefore, the Project would not result in the exposure of sensitive receptors to CO hot spots.

Mitigation Measures

AQ-1 In accordance with SJVAPCD Rule 9510, the County of Madera shall ensure that a detailed air impact assessment (AIA) is prepared by the Project applicant detailing the specific construction requirements (i.e., equipment required, hours of use, etc.) associated with the proposed on-site improvements. In accordance with this rule, emissions of NO_X and PM_{10} from construction equipment used or associated with the development Project shall be reduced by 20 percent from baseline (unmitigated) emissions for NO_X and 45 percent from baseline (unmitigated) emissions for PM_{10}. The Project will demonstrate compliance with Rule 9510 before issuance of the first building permit. To reduce short-term air quality impacts attributable to the Proposed Project consistent with Rule 9510, the following measures would likely be implemented:

- During all construction activities, all diesel-fueled construction equipment including, but not limited to, rubber-tired dozers, graders, scrapers, excavators, asphalt paving equipment, cranes, and tractors shall be California Air Resources Board (CARB) Tier 4 Certified or better as set forth in Section 2423 of Title 13 of the California Code of Regulations, and Part 89 of Title 40 of the Code of Federal Regulations.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. Equipment maintenance records shall be kept on-site and made available upon request by the SJVAPCD or the County of Madera.

- The Project applicant shall comply with all applicable SJVAPCD rules and regulations. Copies of any applicable air quality permits and/or monitoring plans shall be provided to the City.

AQ-2 Madera County shall ensure that the following actions shall be implemented by the project applicant and maintained during construction by the project contractor in order to reduce the potential for exposure to valley fever during construction activities:

- Suspend work during period of high winds or dust storms.
- When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
- When digging a trench or fire line or performing other soil-disturbing tasks, position workers upwind when possible.
- When exposure to dust is unavoidable, require that workers wear NIOSH-approved respiratory protection with particulate filters rated as N95, N99, N100, P100, or HEPA.

AQ-3 To increase awareness to workers about the potential for valley fever, the following actions shall be required:

- Workers and supervisors shall be trained on:
    - Symptoms of valley fever.
    - Effective practices for preventing valley fever such as avoiding dust and working upwind of dust, using respirators when necessary.
    - Showering as soon as possible after work to limit exposure and transport of the fungal spores.
- The following CDPH materials on valley fever shall be distributed to all workers and supervisors:
    - CDPH pamphlet "*Preventing Work-Related Coccidioidomycosis (Valley Fever).*" Available at: http://www.cdph.ca.gov/HealthInfo/discond/Pages/Coccidioidomycosis.aspx.
    - CDPH Valley Fever Fact Sheet. Available at: http://www.cdph.ca.gov/HealthInfo/discond/Pages/Coccidioidomycosis.aspx.

e) Would the project create objectionable odors affecting a substantial number of people?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Short-Term Construction Impacts

During construction, the Proposed Project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the site. However, these emissions are short-term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the construction area. Therefore, under CEQA, construction odors would result in a less than significant impact related to odor emissions.

Long-Term Operational Impacts

The SJVAPCD identifies certain land uses as sources of odors. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, transfer stations, and fiberglass molding. The Project does not contain any of the land uses identified as typically associated with emissions of objectionable odors. As such, a less than significant impact would occur.

4.4 Biological Resources

For use in this ISMND, ECORP Consulting, Inc. prepared a Biological Resources Assessment (BRA) to collect information on the biological resources present within the area potentially affected by the Project and to determine potential project impacts on biological resources. The Study Area consists of the Project grading limits, a temporary construction easement, construction staging areas, and a 250-foot buffer. The BRA is included in its entirety as Appendix B of this Initial Study. The results of the BRA are summarized herein and provide the basis for the impact determinations presented in this section of the checklist.

4.4.1 Regulatory Setting

This section lists and summarizes federal, state, and local regulations pertinent to potential project impacts on significant biological resources. Additional detail regarding these regulations are provided in the BRA (see Appendix B)

Federal Regulations

Federal Endangered Species Act

ESA protects plants and animals that are listed as endangered or threatened by the USFWS and the NMFS. Section 9 of ESA prohibits the taking of listed wildlife, where take is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16USC 1538). Under Section 7 of ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

Critical Habitat and Essential Habitat

Critical habitat is defined in Section 3 of ESA as (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Excluded essential habitat is defined as areas that were found to be essential habitat for the survival of a species and assumed to contain at least one of the primary constituent elements for the species but were excluded from the critical habitat designation. The USFWS has stated that any action within the excluded essential habitat that triggers a federal nexus will be required to undergo the Section 7(a)(1) process, and the species covered under the specific critical habitat designation would be afforded protection under Section 7(a)(2) of ESA.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22].

Federal Clean Water Act

The federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The USEPA also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

State or Local Regulations

California Endangered Species Act

CESA (Fish and Game Code Sections 2050-2116) generally parallels the main provisions of FESA, but unlike its federal counterpart, CESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened or candidate species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of FESA and CESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA.

Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code §§ 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. CESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA. Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird.

Species of Special Concern

SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under FESA, CESA or the California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role;
- The species is listed as federally (but not state) threatened or endangered, or meets the state definition of threatened or endangered but has not formally been listed;
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status;
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for state threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, state-threatened, or endangered species are considered “significant” under CEQA.

California Rare Plant Ranks

The CNPS maintains the *Inventory of Rare and Endangered Plants of California* (CNPS 2017), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed
- Rare Plant Rank 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 1 through 3, with 1 being the most threatened and 3 being the least threatened. Factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection (CNPS 2017).

Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve “discharging waste, or proposing to discharge waste, with any region that could affect the water of the state” (Water Code 13260(a)). Waters of the State are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

California Environmental Quality Act

In accordance with CEQA Guidelines § 15380, a species not protected on a federal or state list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in FESA, CESA, and §§ 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the CEQA Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either USFWS or CDFW.

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant, and are particularly relevant to species of special concern (SSC). For purposes of this ISMND impacts on biological resources are considered significant if the project will:

- 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 CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected Waters of the U.S. including wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- 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;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan (NCCP), or other approved local, regional or state HCP.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population-wide or region-wide basis.

Local Plans and Ordinances

Madera County General Plan

Section 5: Agricultural and Natural Resources of the *Madera County General Plan Policy Document* includes several goals and policies related to the protection of forest resources, water resources, wetland and riparian areas, fish and wildlife habitat, and vegetation. Additionally, Section 5 includes several goals and policies related to open space for the preservation of natural resources (Madera County 1995).

The goals and policies emphasize minimization of construction-related impacts on flood waters, flowing rivers, streams, creeks, or reservoir waters and requires implementation of best management policies to prevent impacts to waters resources. The goals and policies also include compliance with wetlands policies of the USACE, USFWS, and CDFW; mitigation for loss of regulated and unregulated wetlands; implementation of riparian protection zones; conservation of upland areas adjacent to wetlands; preservation and enhancement of native riparian habitat at a ratio of 3:1; protection of critical nesting foraging areas; and preservation of habitat for rare, threatened, endangered, and/or other special-status species (Madera County 1995).

4.4.2 Environmental Setting

The methods used to determine the presence/absence of significant biological resources with the project study area are explained in detail in the BRA (Appendix B of this IS/MND). In preparation of this IS/MND ECORP conducted a review current literature; conducted a series of site reconnaissance of the Study Area on March 15, and April 18, 19, and 20, 2017; performed an Aquatic Resources Delineation; and conducted Special-Status Plant Surveys [April 18, 19, and 20, 2017 and June 21, 22, and 23, 2017]. The findings of these activities are described in detail in Appendix B, and are summarized below.

Vegetation Communities and Land Cover Types

Four vegetation communities and land cover types were identified within the Study Area. These include annual grassland, orchard, agriculture, and ruderal. These vegetation communities and land cover types are described below.

Annual Grassland

The northern portion of the Study Area is characterized by nonnative annual grassland. These areas were primarily dominated by soft chess (*Bromus hordeaceous*) with other dominates including Mediterranean barley (*Hordeum marinum*), foxtail barely (*Hordeum murinum*), and filaree (*Erodium botrys*).

Orchard

The northern boundary of the Study Area abuts an existing orchard. Trees present within the orchard included Chinese pistache (*Pistacia chinensis*) and orange (*Citrus* sp.). The understory of the orchard is dominated by nonnative grasses and forbs including foxtail barely, soft chess, ripgut brome (*Bromus diandrus*), bur clover (*Medicago polymorpha*), and red stemmed filaree (*Erodium cicutarium*).

Agriculture

Several areas in the northern and southern portions of the Study Area were characterized by agricultural fields. The agricultural fields were either disced or in active production. The disced agricultural fields are dominated by nonnative annual grasses and forbs including cultivated oat (*Avena sativa*), ripgut brome, soft chess, wild oat (*Avena fatua*), Italian ryegrass (*Festuca perennis*), fescue brome (*Festuca bromoides*), winter vetch (*Vicia villosa*), and yellow wild radish (*Raphanus raphanistrum*). The agricultural fields in active production were planted with cultivated oat with winter vetch and yellow wild radish also present within the fields.

Ruderal

Ruderal areas throughout the Study Area are characterized by existing dirt roads or other disturbed areas. Ruderal areas were dominated by nonnative grasses and forbs consisting of ripgut brome, foxtail barely, rat-tailed vulpia (*Festuca myuros*), purple wild radish (*Raphanus sativa*), and pineapple weed (*Matricaria discoidea*).

Potential Waters of the U.S.

A total of 6.922 acres of potential Waters of the U.S. have been mapped within the Study Area during the Aquatic Resources Delineation. Potentially jurisdictional features mapped within the Study Area include vernal pools, seasonal wetlands, seasonal wetland swales, and ditches are listed in Table 4.4-1: Potential Waters of the U.S, below. Maps showing the locations of these resources are included in the BRA, Appendix B of this ISMND (see Figure 5a-5d: Potential Waters of the U.S.)

Table 4.4-1. Potential Waters of the U.S. within the Study Area

Type	Acres[1]
Wetlands	
Vernal Pools	3.525
Seasonal Wetland	0.806
Seasonal Wetland Swale	2.563
Other Waters	
Ditch	0.028
Total	**6.922**

- [1] Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

Vernal Pools

In general, vernal pools are topographic basins underlain with an impermeable or semi-permeable hardpan or duripan layer. Direct rainfall and surface runoff inundate the pools during the wet season. The pools remain inundated and/or the soil maintains saturation through spring and are dry by late spring till the following wet season. Several vernal pools were mapped within the northern and central portions of the Study Area. In general, four main variations in plant composition of vernal pools were observed: 1) dominated by creeping spikerush (*Eleocharis macrostachya*), slender popcorn-flower (*Plagiobothrys stipitatus*) and dwarf woolly-heads (*Psilocarphus brevissimus*) with Mediterranean barley dominant on the fringe of vernal pools; 2) dominated by slender popcorn-flower, Solano downingia (*Downingia ornatissima*), and hyssop loosestrife (*Lythrum hyssopifolia*); 3) dominated by creeping spikerush, slender popcorn-flower, water pygmy-weed (*Crassula aquatica*), and larger water-starwort (*Callitriche heterophylla*); and 4) primarily dominated by least spikerush (*Eleocharis acicularis* var. *acicularis*) with other dominants including slender popcorn-flower and dwarf woolly-heads.

Seasonal Wetland

Seasonal wetlands are ephemerally wet due to the accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short and seasonal wetlands are commonly dominated by nonnative annual, and sometimes perennial, hydrophytic species. There were several seasonal wetlands mapped throughout the Study Area. Seasonal wetlands were primarily dominated by Mediterranean barley and hyssop loosestrife with toad rush (*Juncus bufonius*).

THIS PAGE INTENTIONALLY LEFT BLANK

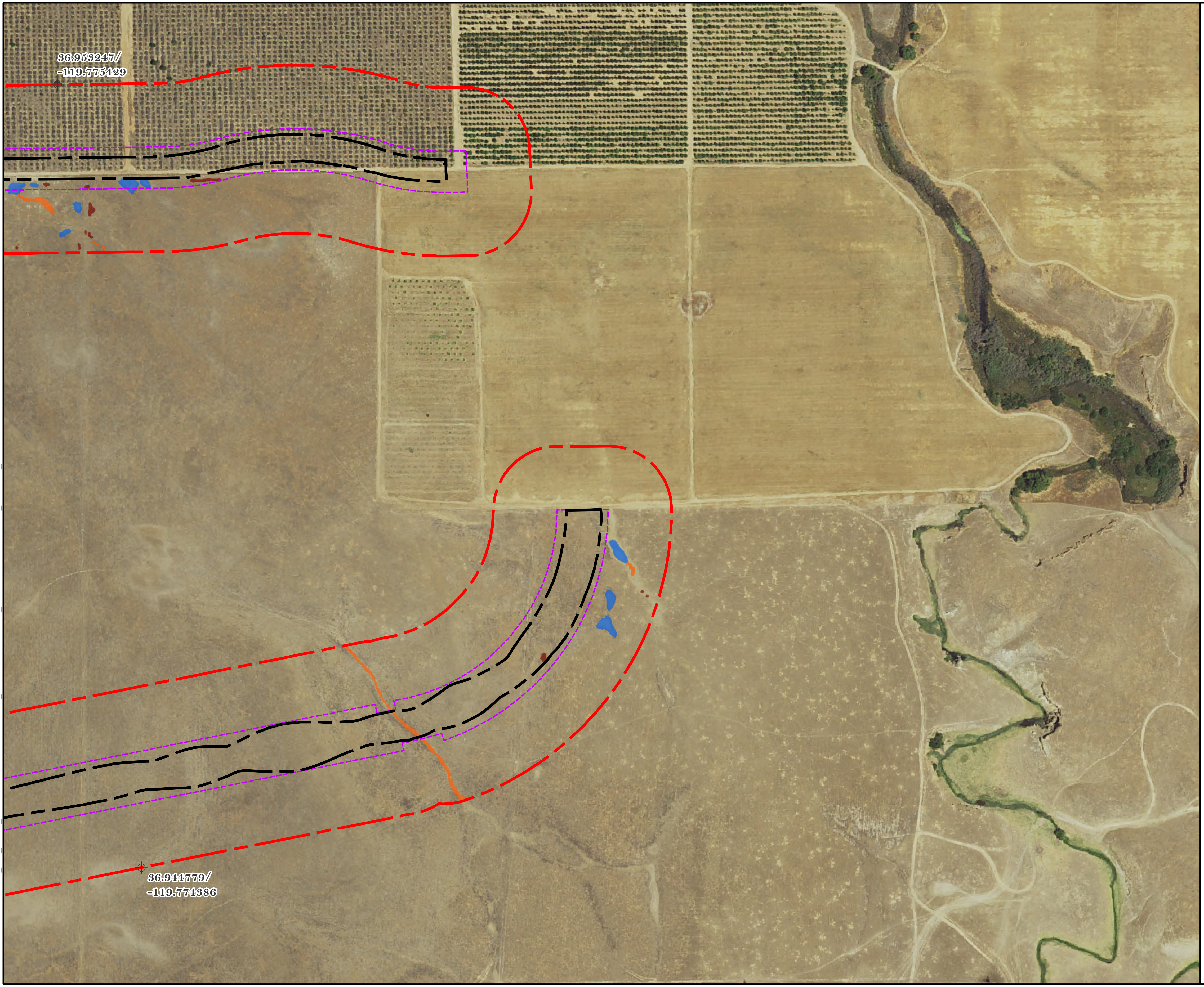


Figure 5a.
Potential Waters of the U.S.
(1 of 4)

Map Features

- ⌖ Reference Coordinate (NAD83)
- Study Area (250' Buffer)
- Grading Limits
- Temporary Construction Easement

Waters of the U.S. (6.922 acres) [1] *

Wetlands (4.331 acres)

- 🟫 Seasonal Wetland - 0.806 acres
- 🟦 Vernal Pool - 3.525 acres

Other Waters (2.592 acres)

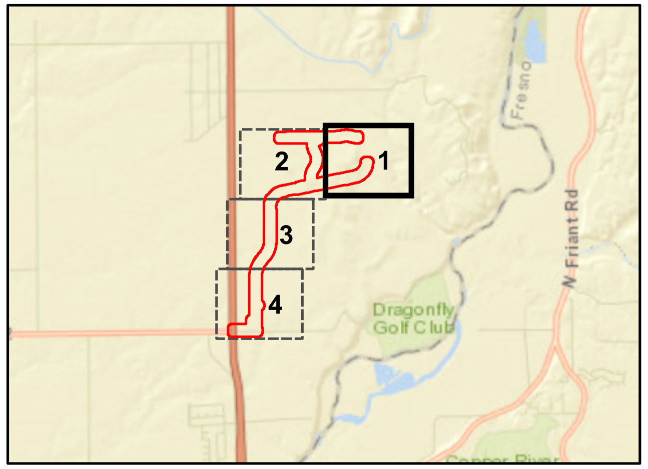
- 🟧 Seasonal Wetland Swale - 2.563 acres

---

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Boulevard Road Alignment

Scale in Feet
0 200 400

Photo Source: NAIP 2014
Boundary Source: Morton and Pitalo
Delineators: Clay DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/29/2017

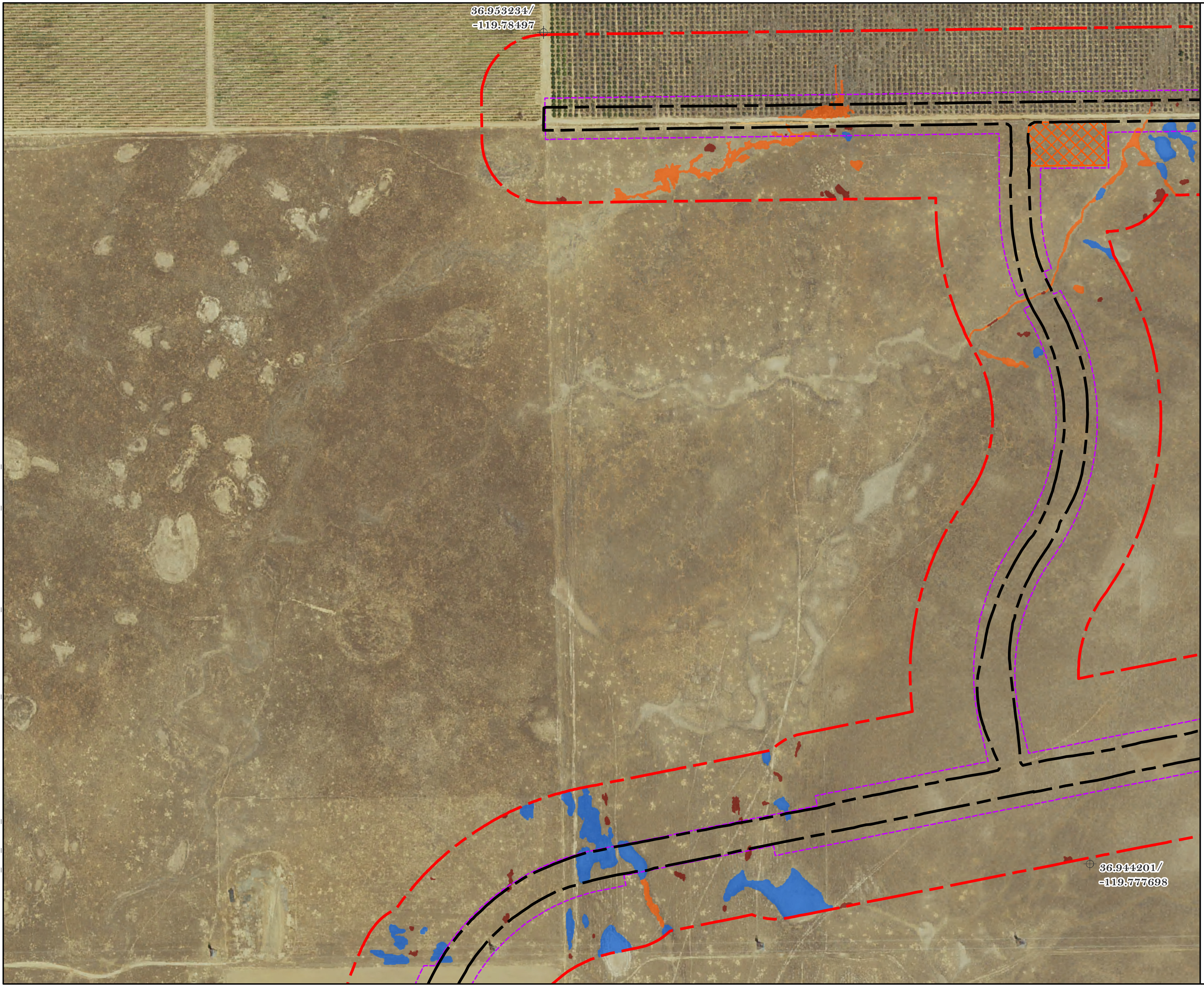


Figure 5b.
Potential Waters of the U.S.
(2 of 4)

Map Features

- ⌖ Reference Coordinate (NAD83)
- 🟥 Study Area (250' Buffer)
- ⬛ Grading Limits
- ▨ Construction Staging
- ☐ Temporary Construction Easement

Waters of the U.S. (6.922 acres) [1] *

Wetlands (4.331 acres)

- 🟫 Seasonal Wetland - 0.806 acres
- 🟦 Vernal Pool - 3.525 acres

Other Waters (2.592 acres)

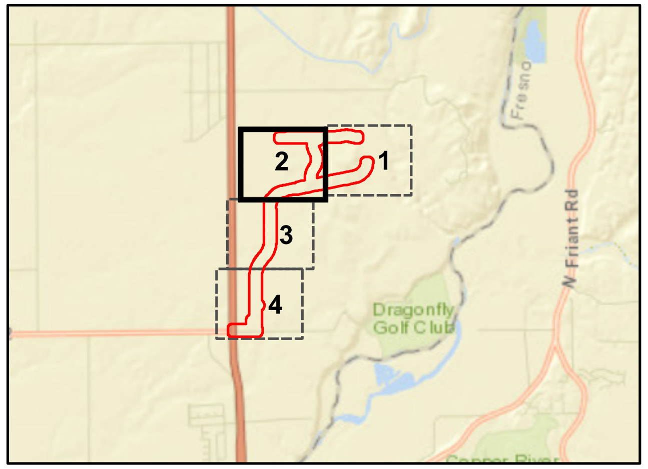
- 🟧 Seasonal Wetland Swale - 2.563 acres
- 🟨 Ditch - 0.028 acres

---

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Boulevard Road Alignment

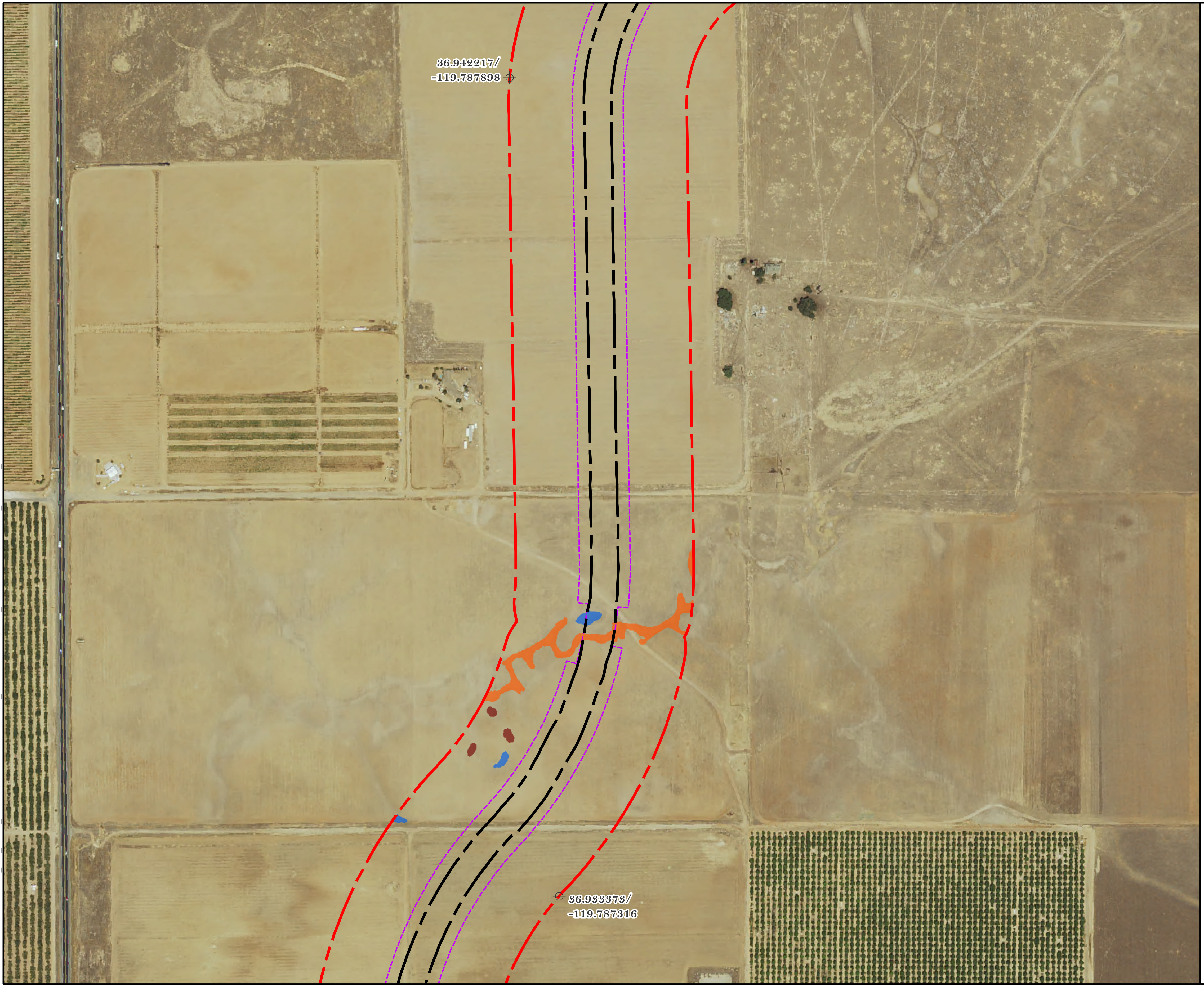
Scale in Feet
0 200 400

Photo Source: NAIP 2014
Boundary Source: Morton and Pitalo
Delineators: Clay DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/29/2017

ECORP: N:\2017\2017-089_RIO_MESA_BLVD\MAPS\JURISDICTIONAL_DELINEATION\ACOE_DELINEATION\V3\RMRA_WATERS_V3.MXD-CHINKELMAN 9/29/2017

Figure 5c.
Potential Waters of the U.S.
(3 of 4)



Map Features

⌖ Reference Coordinate (NAD83)

▭ Study Area (250' Buffer)

▭ Grading Limits

▭ Temporary Construction Easement

Waters of the U.S. (6.922 acres) [1] *

Wetlands (4.331 acres)

🟥 Seasonal Wetland - 0.806 acres

🟦 Vernal Pool - 3.525 acres

Other Waters (2.592 acres)

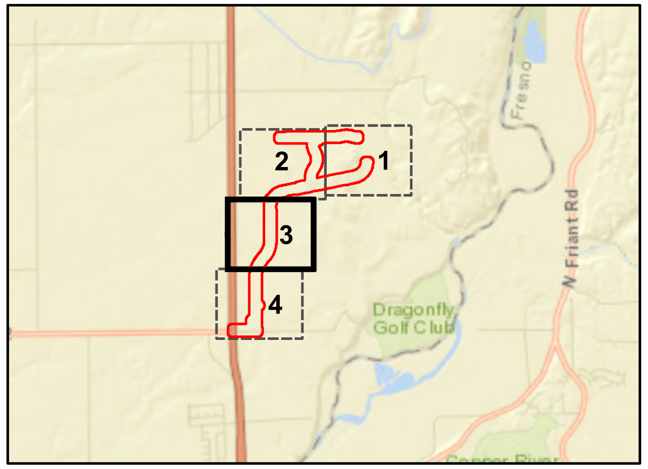
🟧 Seasonal Wetland Swale - 2.563 acres

---

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

ECORP: N:\2017\2017-089_RIO_MESA_BLVD\MAPS\JURISDICTIONAL_DELINEATION\ACOE_DELINEATION\V3\RMRA_WATERS_V3.MXD-CHINKELMAN 9/29/2017

2017-089 Rio Mesa Boulevard Road Alignment

Scale in Feet
0 200 400

Photo Source: NAIP 2014
Boundary Source: Morton and Pitalo
Delineators: Clay DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/29/2017

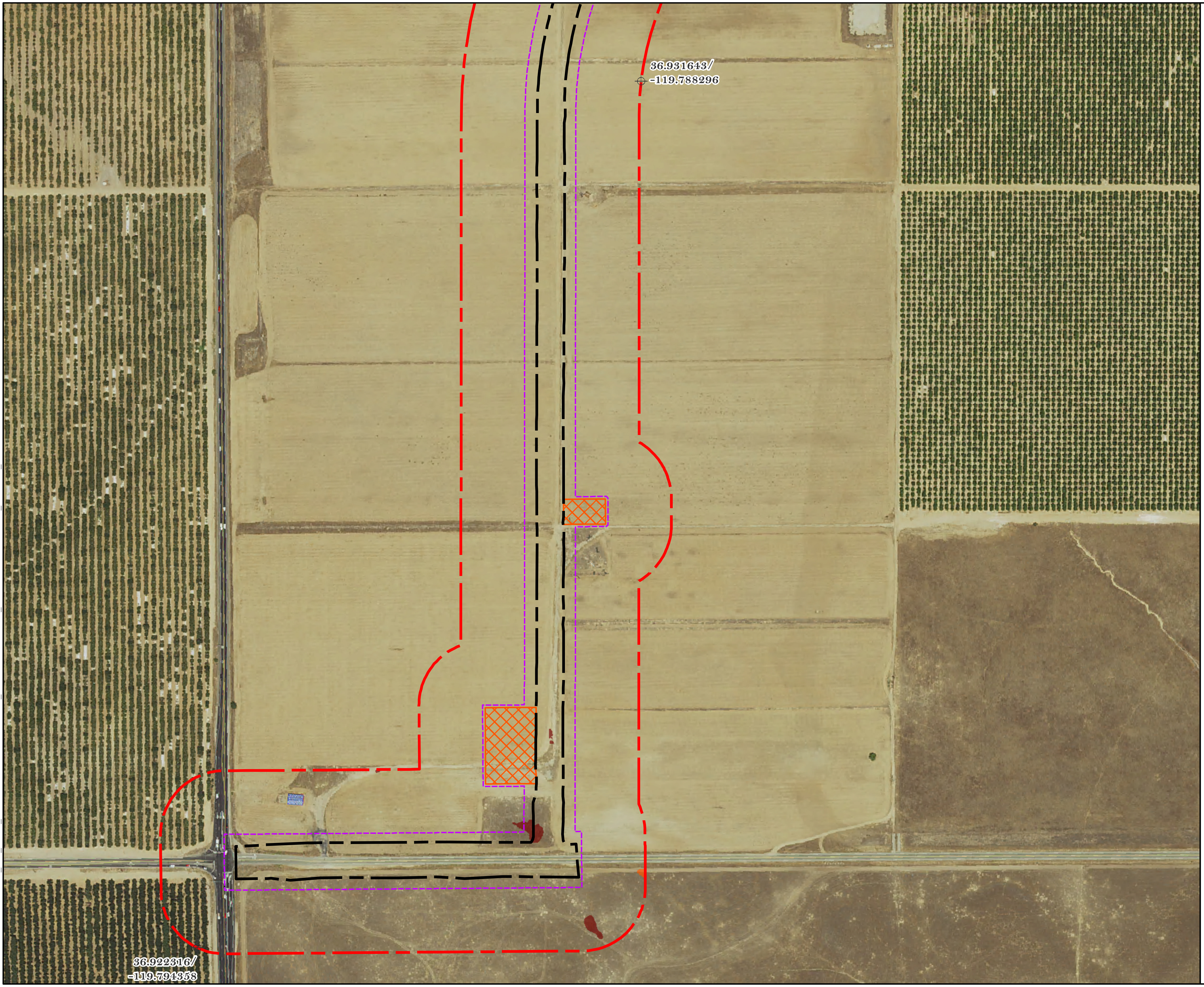


Figure 5d.
Potential Waters of the U.S.
(4 of 4)

Map Features

⌖ Reference Coordinate (NAD83)

⬚ Study Area (250' Buffer)

⬚ Grading Limits

▨ Construction Staging

⬚ Temporary Construction Easement

Waters of the U.S. (6.922 acres) [1] *

Wetlands (4.331 acres)

🟥 Seasonal Wetland - 0.806 acres

Other Waters (2.592 acres)

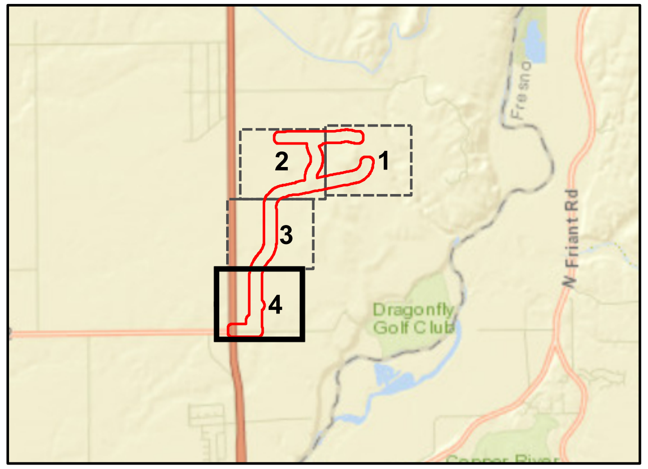
🟧 Seasonal Wetland Swale - 2.563 acres

---

[1] *Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.*

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Boulevard Road Alignment

Scale in Feet
0 200 400

Photo Source: NAIP 2014
Boundary Source: Morton and Pitalo
Delineators: Clay DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

Map Date: 9/29/2017

Seasonal Wetland Swale

Seasonal wetland swales are linear wetland features that do not exhibit an ordinary high-water mark (OHWM). These are typically inundated for short periods during and immediately after rain events, but usually maintain soil saturation for longer periods during the wet season. Several seasonal wetland swales were mapped throughout the Study Area. Seasonal wetland swales were primarily dominated by Mediterranean barely with other dominants including slender popcorn-flower, dwarf woolly-heads, button-celery (*Eryngium castrense*), and annual bluegrass (*Poa annua*).

Ditch

Ditches are linear features constructed to convey stormwater and/or irrigation water. Two ditches are present alongside the northern dirt road within the Study Area. These ditches are relatively shallow and display an OHWM. These ditches were primarily dominated by curly dock (*Rumex crispus*) and annual rabbit-foot grass (*Polypogon monspeliensis*).

Soils

According to the Soil Survey Geographic (SSURGO) Database for Madera County, California (NRCS 2017a), eight soil units, or types, have been mapped within the Study Area (Figure 3. *Natural Resources Conservation Service Soil Types*):

- AsA – Alamo clay, 0 to 1 percent slope;
- RaA – Ramona sandy loam, 0 to 3 percent slopes
- RaB – Ramona sandy loam, 3 to 8 percent slopes
- RdC – Redding gravelly loam, 3 to 15 percent slopes
- RgC – Redding-Raynor complex, 3 to 15 percent slopes
- SaA – San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17
- WrB – Whitney and Rocklin sandy loams, 3 to 8 percent slopes
- WrC – Whitney and Rocklin sandy loams, 8 to 15 percent slopes

Alamo clay, 0 to 1 percent slopes (Asa) is partially composed of Alamo, which are considered hydric when occurring in fan remnants. Ramona sandy loam, 0 to 3 percent slopes (RaA) and Ramona sandy loam, 3 to 8 percent slopes (RaB) contain unnamed components, which are considered hydric when occurring in depressions. Whitney and Rocklin sandy loams, 3 to 8 percent slopes (WrB) and Whitney and Rocklin sandy loams, 8 to 15 percent slopes (WrC) contain unnamed and ponded components, which are considered hydric when occurring in depressions. None of the remaining soil types contain hydric components (NRCS 2017b).

Special-Status Plants

A total of 17 special-status plant species were identified as having the potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, five species were determined to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. A brief description of the remaining 12 species that have the potential to occur within the Study Area are presented below.

Brassy Bryum

Brassy bryum (*Bryum chryseum*) is not listed pursuant to either FESA or CESA, but is designated as a CRPR 4.3 species. This species is a moss that occurs in openings in chaparral, cismontane woodland, and valley and foothill grassland (CNPS 2017). Brassy bryum is known to occur at elevations ranging from 164 to 1,969 feet above MSL (CNPS 2017). The current range of this species in California includes Amador, Butte, Fresno, Madera, and Mendocino counties (CNPS 2017).

While there are no CNDDB documented occurrences of brassy bryum within five miles of the Study Area (CDFW 2017a), the annual grassland within the Study Area provides suitable habitat for this species. Brassy bryum has potential to occur onsite.

Hoover's Calycadenia

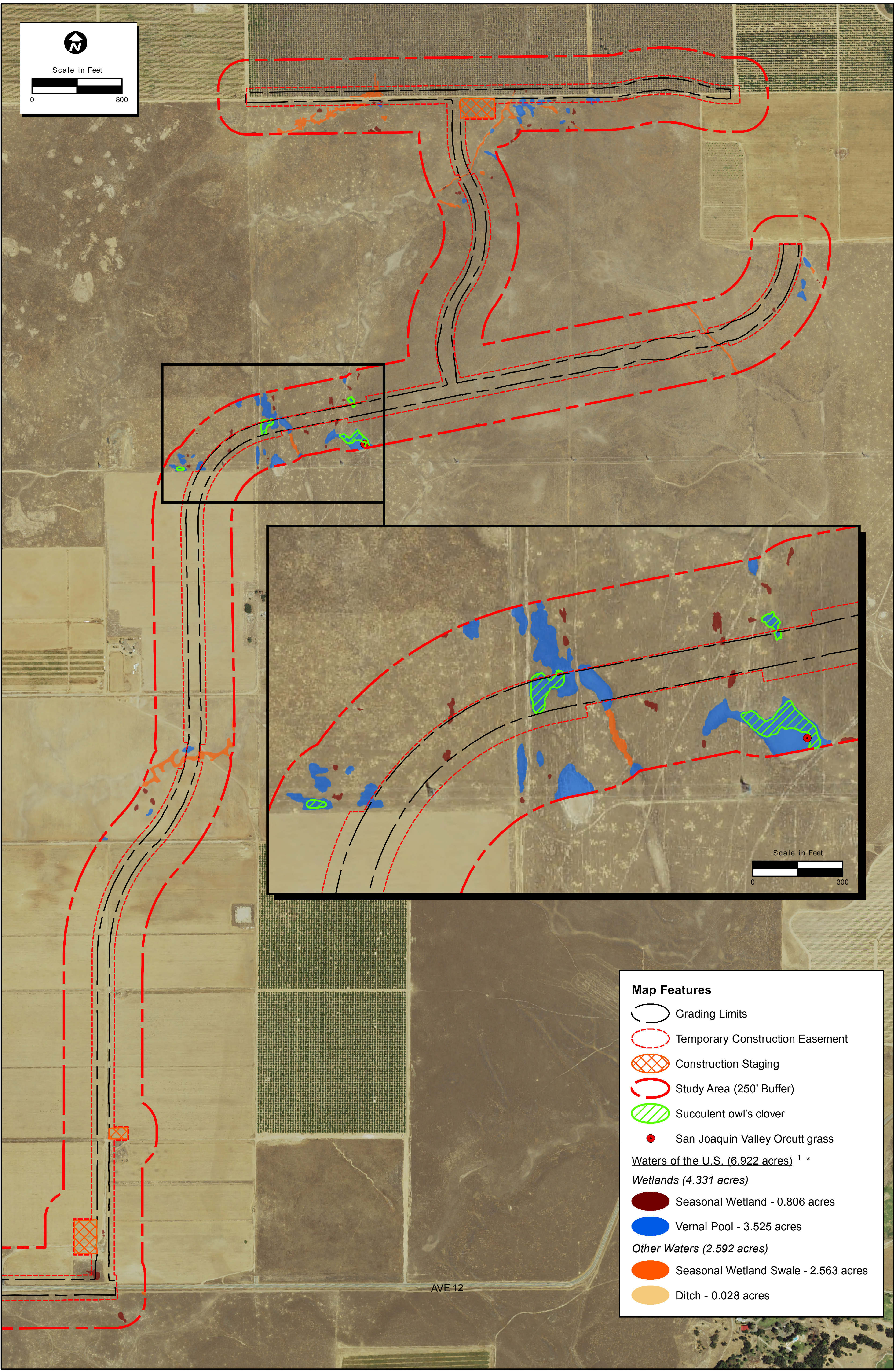
Hoover's calycadenia (*Calycadenia hooveri*) is not listed pursuant to either FESA or CESA, but is designated as a CRPR 1B.3 species. This plant is an herbaceous annual that occurs in rocky soils in cismontane woodland and valley and foothill grassland (CNPS 2017). Hoover's calycadenia blooms from July through September and is known to occur at elevations ranging from 213 to 984 feet above MSL (CNPS 2017). Hoover's calycadenia is endemic to California; the current range for this species includes Calaveras, Madera, Merced, Mariposa, and Stanislaus counties (CNPS 2017).

While there are no CNDDB documented occurrences of Hoover's calycadenia within five miles of the Study Area (CDFW 2017a), the annual grassland onsite provides marginally suitable habitat for this species. Hoover's calycadenia has low potential to occur onsite. This species was not observed during special-status plant surveys conducted by ECORP in 2017.

Succulent Owl's Clover

Succulent owl's clover (*Castilleja campestris* ssp. *succulenta*) is listed as threatened and endangered pursuant to FESA and CESA, respectively and is designated as a CRPR 1B.2 species. This species is a hemiparasitic herbaceous annual that occurs in vernal pools that are often acidic (CNPS 2017). Succulent owl's clover blooms from April to May, and it is known to occur at elevations ranging from 164 to 2,461 feet above MSL (CNPS 2017). Succulent owl's clover is endemic to California; the current range of this species includes Fresno, Madera, Merced, Mariposa, San Joaquin, and Stanislaus counties (CNPS 2017).

There are nine CNDDB documented occurrences of succulent owl's clover within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the Study Area (CDFW 2017b and USFWS 2017b). Succulent owl's clover is present within the Study Area and was identified in four vernal pools within the Study Area during surveys conducted in 2017. The locations of succulent owl's clover found during site surveys is shown in Figure 6. Special-Status Plant Locations.



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\SSS_Survey_and_Mapping\Botanics\RMRA_Plants_V2.mxd (CCH)-chinkelman 9/25/2017

Map Date: 9/25/2017
Photo Source: Madera County NAIP 2014

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 6. Special-Status Plant Locations

2017-089 Rio Mesa Boulevard Road Alignment

California Jewelflower

California jewelflower (*Caulanthus californicus*) is listed as endangered pursuant to the FESA and CESA and is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in chenopod scrub, pinyon and juniper woodland, and Valley and foothill grassland on sandy soils (CNPS2017). California jewelflower blooms from February to May, and it is known to occur at elevations ranging from 200 to 3,281 feet above MSL (CNPS 2017). California jewelflower is endemic to California; the current range of this species includes Fresno, Kern, Kings, Santa Barbara, San Luis Obispo, and Tulare counties. This species is believed to be extirpated from Kings and Tulare counties (CNPS 2017).

While there are no CNDDB documented occurrences of California jewelflower within five miles of the Study Area (CDFW 2017a), the annual grassland within the Study Area provides marginally suitable habitat for this species. California jewelflower has low potential to occur onsite. There is no critical habitat for this species mapped within Study Area.

Ewan's Larkspur

Ewan's larkspur (*Delphinium hansenii*) is not listed pursuant to either FESA or CESA, but is designated as a CRPR 4.2 species. This species is an herbaceous perennial that occurs in cismontane woodland and valley and foothill grassland on rocky soils (CNPS 2017). Ewan's larkspur blooms from March to May, and it is known to occur at elevations ranging from 196 to 1,969 feet above MSL (CNPS 2017). Ewan's larkspur is endemic to California; the current range of this species includes Calaveras, Fresno, Kern, Madera, Merced, and Tulare counties (CNPS 2017).

While there are no CNDDB documented occurrences of Ewan's larkspur within five miles of the Study Area (CDFW 2017a), the annual grassland within the Study Area provides marginally suitable habitat for this species. Ewan's larkspur has low potential to occur onsite.

Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the FESA or CESA, but is designated as a CRPR 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas in Valley and foothill grasslands (CNPS 2017). Dwarf downingia also appears to have an affinity for slight disturbance since it has been found in manmade features such as tire ruts, scraped depressions, stock ponds, and roadside ditches (Baldwin et al. 2012 and CDFW 2017a). This species blooms from March through May and is known to occur at elevations ranging from 3 to 1,460 feet above MSL (CNPS 2017). The current range of this species in California includes Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2017).

There is one documented occurrence of dwarf downingia within five miles of the Study Area (CDFW 2017a). The vernal pools and seasonal wetlands onsite provide suitable habitat for this species. Dwarf downingia has potential to occur onsite.

Spiny-Sepaled Button-Celery

Spiny-sepaled button-celery (*Eryngium spinosepalum*) is not listed pursuant to either FESA or CESA, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual/perennial that occurs in vernal pools within Valley and foothill grassland (CNPS 2017). Spiny-sepaled button-celery blooms from April through June and is known to occur at elevations ranging from 262 to 3,199 feet above MSL (CNPS 2017). Spiny-sepaled button-celery is endemic to California; the current range of this species includes Contra Costa, Fresno, Kern, Madera, Merced, San Luis Obispo, Stanislaus, Tulare, and Tuolumne counties (CNPS 2017).

There are four CNDDB documented occurrences of spiny-sepaled button-celery within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provides suitable habitat for this species. Spiny-sepaled button celery has potential to occur onsite.

Shining Navarretia

Shining navarretia (*Navarretia nigelliformis* ssp. *radians*) is not listed pursuant to either FESA or CESA, but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in vernal pools within cismontane woodland and Valley or foothill grassland (CNPS 2017). Shining navarretia blooms April through July and is known to occur at elevations ranging from 249 to 3,281 feet above MSL (CNPS 2017). Shining navarretia is endemic to California; the current range of this species includes Alameda, Contra Costa, Colusa, Fresno, Madera, Merced, Monterey, San Benito, San Joaquin, and San Luis Obispo counties (CNPS 2017).

While there are no CNDDB documented occurrences of shining navarretia within five miles of the Study Area (CDFW 2017a), the vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area may provide suitable habitat for this species. Shining navarretia has potential to occur onsite. This species was not observed during special-status plant surveys conducted by ECORP in 2017.

San Joaquin Valley Orcutt Grass

San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) is listed as threatened and endangered pursuant to the FESA and CESA, respectively and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in vernal pools (CNPS 2017). San Joaquin Valley Orcutt grass blooms from April to September and is known to occur at elevations ranging from 32 to 2,477 feet above MSL (CNPS 2017). San Joaquin Valley Orcutt grass is endemic to California; the current range of this species includes Fresno, Madera, Merced, Solano, Stanislaus, and Tulare counties (CNPS 2017).

There are seven CNDDB occurrences of San Joaquin Valley Orcutt grass within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the study area (CDFW 2017b and USFWS 2017b). San Joaquin Valley Orcutt grass is present within the Study Area and was identified in one vernal pool within the Study

Area during surveys conducted in 2017 (see Figure 6, above). San Joaquin Valley Orcutt grass is present onsite.

Hairy Orcutt Grass

Hairy Orcutt grass (*Orcuttia pilosa*) is listed endangered pursuant to both FESA and CESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in vernal pools (CNPS 2017). Hairy Orcutt grass blooms from May through September and is known to occur at elevations ranging from 151 to 656 feet above MSL (CNPS 2017). Hairy Orcutt grass is endemic to California; the current range of this species includes Butte, Glenn, Madera, Merced, Stanislaus, and Tehama counties (CNPS 2017).

There are three CNDDB documented occurrences of hairy Orcutt grass within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the study area (CDFW 2017b and USFWS 2017b). Hairy Orcutt grass has potential to occur onsite. This species was not observed during special-status plant surveys conducted by ECORP in 2017.

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is listed as endangered pursuant to both FESA and CESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on clay soils that are often acidic in cismontane woodlands, and Valley and foothill grasslands (CNPS 2017). Hartweg's golden sunburst blooms from March to April and is known to occur at elevations ranging from 49 to 492 feet above MSL (CNPS 2017). Hartweg's golden sunburst is endemic to California; the current range of this species includes Fresno, Madera, Merced, Stanislaus, Tuolumne and Yuba counties (CNPS 2017). This species is believed to be extirpated from Yuba County (CNPS 2017).

There are five CNDDB documented occurrences of Hartweg's golden sunburst within five miles of the Study Area (CDFW 2017a). The annual grassland within the Study Area provides suitable habitat for this species. Hartweg's golden sunburst has potential to occur onsite.

There is no critical habitat for this species mapped within Study Area.

Greene's Tuctoria

Greene's tuctoria (*Tuctoria greenei*) is listed endangered pursuant to FESA, rare pursuant to CESA, and designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in vernal pools (CNPS 2017). Greene's tuctoria blooms from May through September and is known to occur at elevations ranging from 98 to 3,510 feet above MSL (CNPS 2017). Greene's tuctoria is endemic to California; the current range of this species includes Butte, Colusa, Fresno, Glenn, Madera, Merced, Modoc, Shasta, San Joaquin, Stanislaus, Tehama, and Tulare counties (CNPS 2017). It is considered extirpated from Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties (CNPS 2017).

While there are no CNDDB documented occurrences of Greene's tuctoria within five miles of the Study Area (CDFW 2017a), the vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Greene's tuctoria has potential to occur onsite. This species was not observed during special-status plant surveys conducted by ECORP in 2017.

Special-Status Wildlife and Fish

Invertebrates

Four special-status invertebrate species were identified as having potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, two species were determined to be absent from the Study Area due to the lack of suitable habitat (see Table 2, Appendix B). No further discussion of these species is provided in this analysis. Brief descriptions of the remaining two species that have the potential to occur within the Study Area are presented below.

Midvalley Fairy Shrimp:

Midvalley fairy shrimp (*Branchinecta mesovallensis*) is not listed pursuant to either FESA or CESA, but occurrences of this species are tracked by the CNDDB. This species was proposed for listing under FESA and was denied. However, midvalley fairy shrimp has limited distribution and qualifies as a CEQA special-status species. Midvalley fairy shrimp was formally described as a species in 2000 (Belk and Fugate 2000). This species typically occurs in small, shallow vernal pools, swales, and various artificial ephemeral wetland types (e.g., roadside puddles, scrapes and ditches, and railroad toe-drain pools) (Belk and Fugate 2000, USFWS 2004). Midvalley fairy shrimp have been collected from late January to early April (Eriksen and Belk 1999). The cysts typically hatch in the first week of pool filling if water temperatures are near 10°C (50°F) (Eriksen and Belk 1999). This species has been documented in several California counties including Sacramento, Solano, Contra Costa, San Joaquin, Madera, Merced, Fresno, and Yolo (Belk and Fugate 2000 and USFWS 2004).

There are two CNDDB documented occurrences of midvalley fairy shrimp within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Midvalley fairy shrimp has potential to occur onsite.

Vernal Pool Fairy Shrimp:

The vernal pool fairy shrimp (*Branchinecta lynchi*) is listed as threatened pursuant to FESA. Vernal pool fairy shrimp may occur in seasonal ponds, vernal pools, and swales during the wet season, which generally occurs from December through May. This species can be found in a variety of pool sizes, ranging from less than 0.001 acre to over 24.5 acres (Eriksen and Belk 1999). The shrimp hatch from cysts when colder water (10°C [50°F] or less) fills the pool and mature in as few as 18 days, under optimal conditions (Eriksen and Belk 1999). At maturity, mating takes place and cysts are dropped. Vernal pool fairy shrimp occur in disjunct patches dispersed across California's Central Valley from Shasta County to Tulare County, the central and southern Coast Ranges from northern Solano County to Ventura County, and three areas in Riverside County (USFWS 2003).

There are two CNDDB documented occurrences of vernal pool fairy shrimp within the Study Area and several additional documented occurrences within five miles of the Study Area (CDFW 2017a).

The vernal pools, seasonal wetlands, and seasonal wetland swales provide suitable habitat for this species. Because of the two CNDDB documented occurrences within the Study Area and suitable habitat is present, vernal pool fairy shrimp is considered to be present onsite. There is no critical habitat for this species mapped within Study Area.

Fish

Three special-status fish species were identified as having potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, all three species were determined to be absent from the Study Area due to the lack of suitable habitat (e.g., perennial drainages) (see Table 2, Appendix B). No further discussion of these species is provided in this analysis.

Amphibians

A total of three special-status amphibians were identified as having potential to occur within Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, one species was determined to be absent from the Study Area due to the lack of suitable habitat (see Table 2, Appendix B). No further discussion of that species is provided in this analysis. A brief description of the remaining two species that have the potential to occur within the Study Area are presented below.

California Tiger Salamander:

The Central Valley Discreet Population Segment (DPS) of California tiger salamander (*Ambystoma californiense*) was listed as threatened by USFWS on August 4, 2004 (Federal Register Vol. 69, No. 149: 47212). The Santa Barbara County and Sonoma County DPS', both of which are disjunct from the larger range of the salamander, are federally listed as endangered. As of August 19, 2010, the California tiger salamander is listed as a threatened species under CESA throughout its range. Populations at the north and south edges of the historical distribution are extirpated; many populations within the interior of the range have been lost, and abundance has been reduced in many areas. Necessary habitat components for California tiger salamanders include intact open terrestrial landscapes used by adults for most of their life history, and ponded aquatic features where reproduction occurs. California tiger salamanders spend most of their adult life within terrestrial subterranean refuges such as California ground squirrel or Botta's pocket gopher (*Thomomys bottae*) burrows (Stebbins 1972, Laredo et al. 1996). Foraging takes place within these subterranean refugia and out in the open at night or during rains. Suitable breeding sites include vernal pools, seasonal wetlands, stock ponds, or, rarely, slow-moving streams. They may use permanent man-made ponds if predatory species (e.g., fish, crayfish) are absent. California tiger salamanders are endemic to California's Central Valley from Yolo County south to Kern County, and from Santa Barbara County north through the inner coast range to Sonoma County (USFWS 2015).

There is one CNDDB documented occurrence of California tiger salamander onsite and several occurrences within five miles of the Study Area (CDFW 2017a). The vernal pools and seasonal wetlands provide suitable breeding habitat and the annual grassland provides suitable dispersal habitat for this species. Additionally, critical habitat for this species is mapped within the Study Area (CDFW 2017b). Because there is one CNDDB documented occurrence with the Study Area, critical habitat is mapped, and suitable habitat is present, California tiger salamander is considered to be present onsite.

Western Spadefoot:

Western spadefoot (*Spea hammondii*) is not listed pursuant to either FESA or CESA; however, it is designated as a CDFW SSC. Necessary habitat components of the western spadefoot include loose, friable soils in which to burrow in upland habitats and breeding ponds. Breeding sites include temporary rain pools such as vernal pools and seasonal wetlands, or pools within portions of intermittent drainages (Jennings and Hayes 1994). Western spadefoots spend most of their adult life within underground burrows or other suitable refugia, such as rodent burrows. In California, western spadefoots are known to occur from the Redding area and Shasta County southward to northwestern Baja California at elevations below 4,475 feet (Jennings and Hayes 1994).

There is a CNDDB documented occurrence of western spadefoot onsite and several occurrences within five miles of the Study Area (CDFW 2017a). Additionally, western spadefoot was observed in one of the vernal pools during the April 2017 reconnaissance visit. The vernal pools and seasonal wetlands provide suitable habitat for this species. Western spadefoot is present onsite.

Reptiles

A total of five special-status reptile species were identified as having potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, four were determined to be absent from the Study Area due to the lack of suitable habitat (see Table 2, Appendix B). No further discussion of these species is provided in this analysis. A brief description of the remaining species is provided below.

Blainville's Horned Lizard:

Blainville's horned lizard (*Phrynosoma blainvillii*) is considered an SSC by CDFW. This species is a relatively large (to 105mm in snout-vent length), dorsoventrally flattened, rounded lizard found historically from Redding, California to Baja, Mexico (Jennings and Hayes 1994). Formally considered the coast horned lizard (*P. coronatum*), the species has gone through a long period of taxonomic instability (Jennings and Hayes 1994; Montanucci 2004, Leaché et al. 2009). This diurnal species can occur within a variety of habitats including scrubland, annual grassland, valley-foothill woodlands and coniferous forests, though it is most common along lowland desert sandy washes and chaparral (Stebbins 2003). In the Coast Ranges, it occurs from Sonoma County south into Baja California (CDFG 1988). It occurs from sea level to 8,000 feet above MSL and an isolated population occurs in Siskiyou County (Stebbins 2003).

Like all horned lizards, Blainville's horned lizard is adorned with pointed and keeled scales, head spines, and parallel lateral fringes of scales, all of which serve to dissuade predators and aid in crypsis (Sherbrooke 2003). This is a ground-dwelling lizard that does not use vertical structures except where they shade the ground (Stebbins and McGinnis 2012).

Blainville's horned lizard is found in open microhabitats such as sandy washes with scattered shrubs or firebreaks in chaparral, where they forage for ants, small beetles and other insects (Jennings and Hayes 1994). Horned lizards (*Phrynosoma*) are native ant specialists and daily activities are centered on aboveground activity patterns of ants, with lizards active generally in mornings and later in the afternoon in the summer. They generally emerge from hibernation in March or April, and are active until September or later. Mating takes place in April through early May (Jennings and Hayes 1994), and an average of 12 (but up to 21) eggs are laid from April to June (Stebbins and McGinnis 2012). Hatchlings 25–27mm in length emerge from July through September (Stebbins and McGinnis 2012). Periods of daily or seasonal inactivity are spent within rodent burrows or underneath the soil or surface objects (CDFG 1988).

There is one historic CNDDB documented occurrence within five miles of the Study Area (CDFW 2017a). The annual grassland within the Study Area provides marginally suitable habitat for this species. Blainville's horned-lizard has low potential to occur onsite.

Birds

A total of 31 special-status bird species were identified as having potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, 19 species were considered to be absent from the Study Area due to the lack of suitable habitat (see Table 2, Appendix B). No further discussion of these species is provided in this analysis. A brief description of the remaining 12 special-status bird species that have the potential to occur within the Study Area is presented below.

Mountain Plover:

The mountain plover (*Charadrius montanus*) is not listed pursuant to either FESA or CESA; however, it is designated as a BCC by USFWS and a SSC by CDFW. This species' breeding range includes Montana, eastern Colorado, Wyoming, New Mexico, Texas, and Oklahoma and the wintering range extends from north-central California to Mexico (Knopf and Wunder 2006). Within their wintering (September through March) range, which consists primarily of the Sacramento, San Joaquin, and Imperial valleys, mountain plovers can be found in plowed fields, heavily grazed annual grassland, and burned fields (Knopf and Rupert 1995 and Knopf and Wunder 2006). Mountain plovers do not nest in California but may occasionally forage within grassland communities (or plowed agricultural fields) during winter.

There are no CNDDB documented occurrences of mountain plover within five miles of the Study Area (CDFW 2017a); however, annual grassland and agricultural fields may provide suitable foraging habitat for this species. Mountain plover has low potential to winter onsite.

Long-Billed Curlew:

The long-billed curlew (*Numenius americanus*) is not listed in accordance with either the FESA or CESA, but is designated as a BCC by USFWS and a CDFW watch list species. The breeding range of this species includes the Great Plains, Great Basin and intermontane valleys of the western U.S. and southwestern Canada (Dugger and Dugger 2002). In the U.S., their wintering range includes California, Louisiana, and Texas. Winter foraging habitat includes rice fields (flooded and unflooded), managed wetlands, evaporation ponds, sewage ponds, and grasslands (Dugger and Dugger 2002). Long-billed curlew do not nest in the region but may occasionally forage within grassland communities (or wetlands, agricultural fields) during winter.

There are no CNDDB documented occurrences of long-billed curlew within five miles of the Study Area (CDFW 2017a); however, the annual grassland provides suitable foraging habitat onsite. Long-billed curlew has potential to winter onsite.

White-Tailed Kite:

White-tailed kite (*Elanus leucurus*) is not listed pursuant to either FESA or CESA; however, the species is fully protected pursuant to Section 3511 of the California Fish and Game Code. This species is a common resident in the Central Valley and the entire length of the California coast and all areas up to the Sierra Nevada foothills and southeastern deserts (Dunk 1995). In northern California, white-tailed kite nesting occurs from March through early August, with nesting activity peaking from March through June. Nesting occurs in trees within riparian, oak woodland, savannah, and agricultural communities that are near foraging areas such as low elevation grasslands, agricultural, meadows, farmlands, savannahs, and emergent wetlands (Dunk 1995).

There are no CNDDB documented occurrences of white-tailed kite within five miles of the Study Area (CDFW 2017a); however, the orchard, annual grassland, transmission towers, and agricultural areas provide suitable habitat for this species. White-tailed kite has potential to nest and forage onsite.

Northern Harrier:

The northern harrier (*Circus cyaneus*) is not listed pursuant to either FESA or CESA; however, it is considered to be a species of special concern by CDFW. This species is known to nest within the Central Valley, along the Pacific Coast, and in northeastern California. The northern harrier is a ground-nesting species, and typically nests in emergent wetland/marsh, open grasslands, or savannah communities usually in areas with dense vegetation (Smith et al. 2011). Foraging occurs within a variety of open environments such as marshes, agricultural fields, and grasslands. Nesting occurs from April through September.

There are no CNDDB documented occurrences of northern harrier within five miles of the Study Area (CDFW 2017a); however, the orchard, annual grassland, and agricultural areas provide suitable habitat for this species. Northern harrier has potential to nest and forage onsite.

Swainson's Hawk:

The Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and are protected pursuant to CESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawks nest within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel, ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus species*). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, discing, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There is one CNDDB documented occurrence of Swainson's hawk within five miles of the Study Area (CDFW 2017a), and the transmission towers, orchard, annual grassland, and agricultural areas provide suitable habitat for this species. Swainson's hawk has potential to nest and forage onsite.

Golden Eagle:

The golden eagle (*Aquila chrysaetos*) is not listed pursuant to either FESA or CESA. However, it is fully protected according to Section 3511 of the California Fish and Game Code and the federal Bald and Golden Eagle Protection Act. Golden eagles generally nest on cliff ledges and/or large lone trees in rolling to mountainous terrain. Golden eagles nest throughout California except the Central Valley, the immediate coast, and portions of southeastern California (Kochert et al. 2002). Occurrences within the Central Valley are usually dispersing post-breeding birds, non-breeding subadults, or migrants. Foraging habitat includes open grassland and savannah.

There are no CNDDB documented occurrences of golden eagle within five miles of the Study Area (CDFW 2017a); however, a golden eagle was observed flying overhead during the site visit. Additionally, the transmission towers and annual grassland within the Study Area provide suitable nesting and foraging habitat for this species. Golden eagle has potential to nest and forage onsite.

Burrowing Owl:

The burrowing owl (*Athene cunicularia*) is not listed pursuant to either FESA or CESA; however, they are designated as a BCC by USFWS and an SSC by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, and roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Poulin et al. 2011). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel, but may also use manmade structures such as cement culverts or pipes; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (CDFG 2012). The breeding season typically occurs between February 1 and August 31 (California Burrowing Owl Consortium 1993; CDFG 2012).

There is one CNDDB documented occurrence of burrowing owl immediately adjacent to the Study Area (CDFW 2017a). The annual grassland community and agriculture fields onsite provide suitable nesting habitat for burrowing owls. No burrowing owls were observed during the site visit; however, many California ground squirrel burrows were observed onsite. Burrowing owl has potential to nest and forage onsite.

Short-Eared Owl:

Short-eared owls (*Asio flammeus*) are not listed pursuant to either FESA or CESA; however, it is designated as a species of special concern by CDFW. The breeding range of this species extends from Alaska south to central California, including the San Francisco Bay region and irregularly in the Sacramento Valley (Holt and Leasure 2006). In the Central Valley, short-eared owls are a wintering species. Wintering habitat includes large open areas within woodlots, weedy areas, stubble fields, and marsh and shrub thickets. Nesting occurs from March through July. Short-eared owls usually do not nest in the Central Valley, but may occasionally forage within grassland and wetland communities during winter.

There are no CNDDB documented occurrences of short-eared owl within five miles of the Study Area (CDFW 2017a); however, the annual grassland and agricultural fields provide marginally suitable foraging habitat for this species. Short-earned owl has low potential to winter onsite.

Loggerhead Shrike:

The loggerhead shrike (*Lanius ludovicianus*) is not listed pursuant to either FESA or CESA, but is considered a BCC by USFWS and an SSC by CDFW. Loggerhead shrikes nest throughout California except the northwestern corner, montane forests, and high deserts (Small 1994). Loggerhead shrikes nest in small trees and shrubs in open country with short vegetation such as pastures, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands (Yosef 1996). The nesting season extends from March through July.

There are no CNDDB documented occurrences of loggerhead shrike within five miles of the Study Area (CDFW 2017a); however, the orchard, annual grassland, and agricultural fields provide suitable nesting and foraging habitat for this species. Loggerhead shrike has potential to nest and forage onsite.

Yellow-Billed Magpie:

The yellow-billed magpie (*Pica nuttalli*) is not listed pursuant to either FESA or CESA, but is considered a USFWS BCC. This endemic species is a yearlong resident of the Central Valley and Coast Ranges from San Francisco Bay to Santa Barbara County. Yellow-billed magpies build large, bulky nests in trees in a variety of open woodland habitats, typically near grassland, pastures or cropland. Nest building begins in late-January to mid-February, which may take up to six to eight weeks to complete, with eggs laid during April-May, and fledging during May-June (Koenig and Reynolds 2009). The young leave the nest at about 30 days after hatching (Koenig and Reynolds 2009). Yellow-billed magpies are highly susceptible to West Nile Virus, which may have been the cause of death to thousands of magpies during 2004-2006 (Koenig and Reynolds 2009).

There are no CNDDB documented occurrences of yellow-billed magpie within five miles of the Study Area (CDFW 2017a); however, the orchard and annual grassland provide suitable nesting habitat for this species. Yellow-billed magpie has potential to occur onsite.

California Horned Lark:

The California horned lark (*Eremophila alpestris*) is not listed pursuant to either FESA or CESA, but is considered a USFWS BCC. The California horned lark is widely distributed throughout North America with 21 recognized subspecies (American Ornithologists' Union 1957). The California horned lark (*E. a. actia*) is one of approximately nine subspecies that breeds and/or winters in California, and is found in the Coast Range and southern San Joaquin Valley south into northern Baja California (Beason 1995). The California horned lark is resident and nonmigratory. They are found in grasslands and other open habitats with sparse vegetation. Nests are grass-lined and built on the ground. Breeding season includes March through July, with a peak of activity in May.

There is one CNDDB documented occurrence of California horned lark within one mile of the Study Area (CDFW 2017a), and the annual grassland and agricultural fields provide suitable nesting habitat for this species. California horned lark has potential to nest and forage onsite.

Tricolored Blackbird:

The tricolored blackbird (TRBL, *Agelaius tricolor*) is listed as a candidate species pursuant to CESA and a USFWS BCC. This colonial nesting species is distributed widely throughout the Central Valley, Coast Range, and into Oregon, Washington, Nevada, and Baja California (Meese et al. 2014). TRBLs nest in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or level of human disturbance. TRBL nesting habitat includes emergent marsh, riparian woodland/scrub, blackberry thickets, densely vegetated agricultural and idle fields (e.g., wheat, triticale, safflower, fava bean fields, thistle, mustard, cane, and fiddleneck), usually with some nearby standing water or ground saturation (Meese et al. 2014). They feed mainly on grasshoppers during the breeding season, but may also forage upon a variety of other insects, grains, and seeds in open grasslands, wetlands, feedlots, dairies, and agricultural fields (Meese et al. 2014). The nesting season is generally from March through August.

There is one CNDDB documented nesting colony of TRBL within five miles of the Study Area (CDFW 2017a). While there is no suitable nesting habitat within the Study Area, the annual grassland provides suitable foraging habitat for this species. Additionally, tricolored blackbird was observed foraging within the vicinity of the Study Area during the March 15, 2017 site visit. TRBL has potential to forage onsite.

Mammals

A total of seven special-status mammal species were identified as having potential to occur within the Study Area based on the literature review (see Table 2, Appendix B). Upon further analysis and after the reconnaissance site visit, three species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining four species that have the potential to occur within the Study Area are presented below.

American Badger:

The American badger (*Taxidea taxus*) is designated in California as an SSC. The species historically ranged throughout much of the state, except in humid coastal forests. Badgers were once numerous in the Central Valley; however, populations now occur in low numbers in the surrounding peripheral parts of the valley and in the adjacent lowlands of eastern Monterey, San Benito, and San Luis Obispo counties (Williams 1986). Badgers occupy a variety of habitats, including grasslands and savannas. The principal requirements seem to be significant food supply, friable soils, and relatively open, uncultivated ground (Williams 1986).

There are no CNDDB documented occurrences of American badger within five miles of the Study Area (CDFW 2017a). The annual grassland onsite provides suitable habitat for this species. American badger has potential to occur onsite.

Pallid Bat:

The pallid bat (*Antrozous pallidus*) is not listed pursuant to either FESA or CESA; however, this species is considered an SSC by CDFW. The pallid bat is a large, light-colored bat with long, prominent ears and pink, brown, or grey wing and tail membranes. This species ranges throughout North America from the interior of British Columbia, south to Mexico, and east to Texas. The pallid bat inhabits low elevation (below 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forest (above 7,000 feet). This species roosts alone or in groups in the crevices of rocky outcrops and cliffs, caves, mines, trees, and in various manmade structures such as bridges, and barns. Pallid bats are feeding generalists that glean a variety of arthropod prey from surfaces as well as capturing insects on the wing. Foraging occurs over grasslands, oak savannahs, ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. Although this species utilizes echolocation to locate prey, often they use only passive acoustic cues. This species is not thought to migrate long distances between summer and winter sites (WBWG 2017).

There are no CNDDB documented occurrences of pallid bat within five miles of the Study Area (CDFW 2017a). However, the orchard trees and abandoned barn structures within the Study Area provide suitable roosting habitat for this species and the annual grassland and orchard provide suitable foraging habitat for this species. Pallid bad has potential to roost and forage onsite.

San Joaquin Kit Fox:

The San Joaquin kit fox (*Vulpes macrotis mutica*) is listed as threatened under CESA and as endangered under FESA. Although the precise historical range of the San Joaquin kit fox is unknown, Grinnell et al. (1937) believed that prior to 1930, San Joaquin kit fox occupied most of the San Joaquin Valley from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side. Since then the San Joaquin kit fox population has declined primarily as a result of habitat loss to agricultural, urban, industrial and mineral development in the San Joaquin Valley. San Joaquin kit fox has been listed as endangered for over 30 years, yet despite the loss of habitat and apparent decline in numbers since the early 1970s, there has never been a comprehensive survey of its entire range or habitat that was once thought to be occupied (USFWS 1983; Morrell 1975). Despite the lack of a comprehensive data set, local surveys, research projects and incidental sightings indicate that kit foxes currently inhabit some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains, from southern Kern County north to Contra Costa, Alameda, and San Joaquin Counties on the west, and near La Grange, Stanislaus County on the east side of the San Joaquin Valley (Williams in litt. 1990), and some of the larger scattered islands of natural land on the San Joaquin Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced Counties (USFWS 1998).

In the southern portion of the range, the kit fox is commonly associated with Valley sink scrub, Valley saltbush scrub, upper Sonoran subshrub scrub, and annual grassland. Kit foxes also inhabit grazed grasslands, petroleum fields (Morrell 1971, O'Farrell 1980), and survive adjacent to tilled or fallow fields (Jensen 1972, Ralls and White 1991). In the central portion of the range, which includes Madera County, the kit fox is associated with Valley sink scrub, interior coast range saltbush scrub, upper Sonoran subshrub scrub, annual grassland and the remaining native grasslands. Agriculture dominates this region where kit foxes mostly inhabit grazed, nonirrigated grasslands, but also live next to and forage in tilled or fallow fields, irrigated row crops, orchards, and vineyards (USFWS 1998). In the northern portion of their range, kit foxes commonly are associated with annual grassland (Hall 1983) and valley oak woodland (Bell 1994). Kit foxes inhabit grazed grasslands, grasslands with wind turbines, and also live adjacent to and forage in tilled and fallow fields, and irrigated row crops (Bell 1994). They usually inhabit areas with loose-textured (friable) soils, suitable for den excavation (USFW 1983). Where soils make digging difficult, the foxes frequently use and modify burrows built by other animals (Orloff et al. 1986). Structures such as culverts, abandoned pipelines, and well casings also may be used as den sites (USFWS 1983).

Kit foxes are primarily nocturnal and carnivorous, but are commonly seen during the day in the late spring and early summer (Orloff et al. 1986). Major prey includes kangaroo rats (*Dipodomys* sp.), black-tailed jackrabbits (*Lepus californicus*), desert cottontails (*Sylvilagus audubonii*), deer mice (*Peromyscus maniculatus*), California ground squirrels, ground nesting birds, and insects (Scrivener et al. 1987).

There is one CNDDB documented occurrence of San Joaquin kit fox within five miles of the Study Area (CDFW 2017a). The annual grassland in the Study Area provides suitable dispersal habitat for this species. San Joaquin kit fox has low potential to occur onsite.

Spotted Bat:

The spotted bat (*Euderma maculatum*) is not listed pursuant to either FESA or CESA; however, this species is considered an SSC by CDFW. The spotted bat is easily identifiable because of its unique coloration, which includes black dorsal fur with three white spots, a white ventral surface, and long pink ears. The spotted bat occurs throughout western North America from British Columbia to Jalisco, Mexico. This species has been found from below sea level to 8,858 feet in elevation, and occurs in arid, low desert habitats all the way to high elevation conifer forests. Specific vegetation types where spotted bats are found include desert, subalpine meadows, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. Roosting sites are generally cracks, crevices, and caves, high in fractured rock cliffs if available. When foraging, spotted bats fly about 66 to 164 feet above the ground and echolocate at a wavelength audible to humans but often not to prey species. The diet of this species is made up primarily of moths (WBWG 2017).

There is one CNDDB documented occurrence within five miles of the Study Area (CDFW 2017a); however, there is no suitable roosting habitat within the Study Area. The annual grassland onsite provides suitable foraging habitat. Spotted bat has low potential to forage onsite.

Wildlife Movement/Corridors

The Study Area is largely undeveloped with several wetland features scattered throughout. Wildlife likely use the annual grassland and wetland features for movement and dispersal; however, the active agricultural fields may hinder wildlife use. Wildlife species that may use the Study Area as a migratory or movement corridor include birds such as passerines, raptors, wading birds, and waterfowl. Highly mobile mammal species such as coyote (*Canis latrans*) and raccoon (*Procyon lotor*) are expected to occasionally move through the Study Area.

4.4.3 Biological Resources (IV.) Environmental Checklist and Discussion

a) Would the project 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?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☒	☐	☐

Discussion:

Special-Status Species

Plants

A total of 12 special-status plants have potential to occur within the Study Area. These include brassy bryum, Hoover's calycadenia, succulent owl's clover, California jewelflower, Ewan's larkspur, dwarf downingia, shining navarretia, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Hartweg's golden sunburst, and Greene's tuctoria. Guideline-level special-status plant surveys (early and late season) were conducted by ECORP for the majority of the Study Area in accordance with guidelines promulgated by USFWS (USFWS 2000), CDFW (CDFG 2009), and CNPS (CNPS 2017) on April 18, 19, and 20, 2017, and June 21, 22, and 23, 2017. Two special-status plants, succulent owl's clover and San Joaquin Valley Orcutt grass, were identified during the surveys. The USFWS and CDFW generally consider plant survey results valid for approximately three years. Therefore, follow up surveys may be necessary if Project implementation occurs after this three-year window to avoid potentially significant impact on these resources. Additionally, portions of the Study Area were only surveyed during late season surveys. With implementation of the following measures, the potential impact on these resources is reduced to less than significant:

BIO-1: Retain a qualified botanist to conduct guideline-level early season special-status plant surveys according to USFWS, CDFW, and CNPS protocols for all portions of the Study Area not included in the 2017 early season surveys. Surveys should be timed according to the blooming period for target species and known reference populations, if available, and/or local herbaria should be visited prior to surveys to confirm the appropriate phenological state of the target species. If the surveys determine the presence of listed species the following shall be implemented:

- Avoid special-status plants with appropriate avoidance buffers established in consultation with USFWS and/or CDFW;
- If avoidance is not obtainable, preserve suitable habitat at an off-site mitigation property; and
- If feasible, transplant, collect seeds, and/or inoculate wetlands with special-status plants that will be impacted Project implementation.

BIO -2: Succulent owl's clover was found in three vernal pools within the Study Area and San Joaquin Valley Orcutt grass was found in one vernal pool. Both are federally listed as threatened and state listed as endangered. Additionally, critical habitat for both these species is mapped within the Study Area. It is recommended to establish avoidance zones around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may vary between species and the specific avoidance zone distance will be determined in coordination with appropriate resource agencies (CDFW and USFWS). If plants cannot be avoided, take coverage from USFWS (under Sections 7 of the FESA) and/or take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required.

Invertebrates

The Study Area provides suitable habitat for the federally threatened vernal pool fairy shrimp and the CNDDB-tracked Midvalley fairy shrimp. USFWS guideline-level dry and wet season surveys have not been conducted for the Study Area; however, vernal pool fairy shrimp are assumed present based on the habitats present onsite and CNDDB documented occurrences onsite and in close proximity to the Study Area. Since vernal pool fairy shrimp are listed under FESA, take coverage from USFWS (under Sections 7 or 10 of FESA) may be required for any impacts to this species and/or its habitat.

With implementation of the following mitigation measures, potential adverse effects on the vernal pool fairy shrimp can be reduced to a level considered less than significant:

BIO 3: Obtain take coverage from USFWS under Section 7 of FESA, and preserve vernal pool fairy shrimp habitat (e.g., vernal pools and seasonal wetlands) at an off-site mitigation property at a ratio of 2:1 or as agreed upon through consultation with USFWS.

Fish

The Study Area does not provide suitable habitat for any special-status fish species. No measures are recommended for special-status fish species.

Amphibians

The Study Area provides suitable habitat for California tiger salamander and western spadefoot. California tiger salamander is assumed present based on the habitats present onsite and CNDDB documented occurrences onsite and in close proximity to the Study Area. Additionally, western spadefoot is considered present as western spadefoots were observed onsite during site visits conducted in 2017. The following measures are recommended.

California Tiger Salamander and Western Spadefoot

The Study Area provides suitable habitat for the federally and state-threatened California tiger salamander. Additionally, critical habitat for this species has been mapped within the Study Area. Prior to construction activities, take coverage from USFWS under Sections 7 or 10 of FESA may be required for any impacts to California tiger salamander and/or their habitat. In addition, take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required for any impacts to California tiger salamander and/or its habitat.

With implementation of the following mitigation measure, potential adverse effects on the California tiger salamander and western spadefoot can be reduced to a level considered less than significant:

BIO-4: Obtain take coverage for California tiger salamander from USFWS under Section 7 or Section 10 of FESA and obtain take coverage for California tiger salamander from CDFW under Section 2081 of the California Fish and Game Code. In addition the following shall be implemented:

- Preserve in perpetuity suitable breeding habitat (e.g., vernal pools and seasonal wetlands) at an off-site mitigation property at a ratio of 2:1 or as agreed upon through consultation with USFWS and CDFW.
- Preserve in perpetuity suitable upland dispersal habitat (e.g., annual grassland within a vernal pool complex) at an off-site mitigation property at a ratio of 3:1 or as agreed upon through consultation with USFWS and CDFW.
- If suitable breeding habitat is ponded prior to initiation of construction activities, retain a qualified biologist to conduct pre-construction larval surveys for California tiger salamander and western spadefoot within the limits of construction to detect larvae prior to installation of the silt fence (see measure before). If California tiger salamander and/or western spadefoot are found, relocation to suitable breeding habitat will be conducted.
- Retain a qualified biologist to conduct burrow excavation and relocate adult California tiger salamanders and/or western spadefoots to suitable habitat.
- Install silt fences around the limits of construction to prevent California tiger salamander and/or western spadefoot from entering the Project area during construction.
- Monitor the silt fence for trapped California tiger salamander and/or western spadefoots during the construction. If trapped spadefoots are found, relocation to suitable habitat will be conducted.

Reptiles

The Study Area provides marginally suitable habitat for Blainville’s horned lizard. With implementation of the following mitigation measures, potential adverse effects on the Blainville’s horned lizard can be reduced to a level considered less than significant:

BIO-5: Retain a qualified biologist to conduct a pre-construction Blainville's horned lizard survey 48 hours prior to construction activities. If Blainville's horned lizards are found, implement the following measures:

- Establish silt fence around the entire impact area as required under MM__; and
- Retain a qualified biologist to relocate any Blainville's horned lizards found within the fenced impact area prior to and during construction.

Birds and MBTA Protected Birds (including Raptors)

Suitable nesting and/or wintering and foraging habitat for 12 special-status birds is present within the Study Area. These include mountain plover, long-billed curlew, white-tailed kite, northern harrier, Swainson's hawk, golden eagle, burrowing owl, short-eared owl, loggerhead shrike, yellow-billed magpie, California horned lark, and TRBL. Norther harrier, Swainson's hawk, golden eagle, and tricolored blackbird were observed on or within the vicinity of the Study Area during 2017 site visits. If nesting individuals are present during construction present, the Project could result in harassment to nesting individuals and may temporarily disrupt foraging activities.

In addition to the above-listed special-status birds, all native birds, including raptors, are protected under the California Fish and Game Code and the federal MBTA. With implementation of the following measures, the potential impact on these resources will be reduced to less than significant:

BIO 6: Retain a qualified biologist to conduct a pre-construction nesting raptor and bird survey of al suitable habitat on the Project site within 14 days of the commencement of construction during the nesting season (February 1 – August 31). Surveys should be conducted within 0.5 mile of the Project site for Swainson's hawk, 300 feet of the Project site for nesting raptors, including burrowing owl, and 100 feet of the Project site for nesting birds.

- If active nests are found, a no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist and are recommended to be 300 feet for raptors and 50 feet for non-raptor songbirds. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest tree, to be determined by a qualified biologist. Once the young are independent of the nest, no further measures are necessary. Pre-construction nesting surveys are not required for construction activity outside the nesting season.

Four special-status birds identified as potentially occurring are migrants and/or wintering species. These are mountain plover, long-billed curlew, short-eared owl, and TRBL. These species do not nest in this region or nesting habitat does not occur onsite. Therefore, no surveys for wintering and/or migrant or foraging species are recommended.

Mammals

The Study Area provides potential habitat for American badger, pallid bat, San Joaquin kit fox, and spotted bat. The following measures are recommended.

American Badger and San Joaquin Kit Fox

As described above, American badger and San Joaquin kit fox could potentially occur within the project Study Area and thus could be adversely affected by Project construction. With implementation of the following measure, the potential impact on these resources will be reduced to less than significant:

BIO-7: Retain a qualified biologist to conduct pre-construction surveys for American badger within 48 hours of construction activities and implement all applicable standard recommendations from the USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance (USFWS 2011).

Pallid Bat and Spotted Bat

Pallid bat has potential to roost within trees and manmade structures within and in the vicinity of the Study Area. No manmade structures are anticipated to be removed as part of the Project; however, trees within the orchard that provide potential roosting habitat will be removed. With implementation of the following measures, the potential impact on these resources will be reduced to less than significant:

BIO-8: Retain a qualified biologist to conduct pre-construction roosting bat surveys for all suitable roosting habitat (i.e., trees) prior to construction activities. If suitable roosting habitat is identified, a qualified biologist will conduct an evening bat emergence survey that may include acoustic monitoring to determine whether or not bats are present. If pallid bats are found, consult with CDFW prior to initiation of construction activities and implement CDFW recommendations for bat protection. These may include but not be limited to establishing avoidance buffers from active roosts in consultation with CDFW.

Spotted bat has potential to forage onsite; no surveys are recommended for foraging bat species.

b) Would the project 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?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☒	☐	☐

Discussion:

Waters of the U.S. and State

Approximately 6.922 acres of potential Waters of the U.S. are located within the Study Area. Of those 6.99 acres approximately 0.806 are seasonal wetlands, 3.525 are vernal pool, and 2.592 are other waters. (Figure 5a-5d. Potential Waters of the U.S.) With implementation of the following measures, the potential impact on to Waters of the U.S. and State will be reduced to less than significant:

BIO-9: Authorization to fill wetlands and other Waters of the U.S. under the Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Mitigation measures will be developed as part of the Section 404 Permit to ensure no-net-loss of wetland function and values. To facilitate such authorization, an application for a Section 404 Permit for the Project will be prepared and submitted to USACE and will include direct, avoided, and preserved acreages to Waters of the U.S. Mitigation for impacts to Waters of the U.S. would consist of a minimum of a 1:1 replacement ratio for direct impacts; however final mitigation requirements will be developed in consultation with USACE. These measures may include:

- Preservation of Waters of the U.S. in perpetuity at an off-site mitigation property;
- Purchase of mitigation credits at an Agency-approved mitigation bank; and/or
- Permittee-responsible mitigation (e.g., preservation and creation) at an off-site mitigation property.

BIO-10: Obtain a Water Quality Certification or waiver pursuant to Section 401 of the CWA from the RWQCB for Section 404 permit actions.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐

Discussion

Refer to the discussions presented under Items a and b above, pertaining to vernal pool species and Waters of the U.S. Implementation of mitigation measures BIO-9 and BIO-10 will reduce the potential impact on federally protected wetlands.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the project 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?	☐	☒	☐	☐

Discussion:

Wildlife have potential to use the Study Area for wildlife movement. Implementation of the following mitigation measure will reduce the impact to less than significant.

BIO-11: Construct wildlife crossings at selected locations through the Project road alignment to facilitate wildlife movement for special-status amphibians and reptiles. The crossings will consist of culverts constructed beneath roadways, the number and locations of which shall be determined in coordination with CDFW and USFWs through the Section 7 and Section 2081 processes described under Mitigation Measure BIO-3 and BIO-4.

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐

Discussion:

As noted above, Section 5: Agricultural and Natural Resources of the *Madera County General Plan Policy Document* includes several goals and policies related to the protection of forest resources, water resources, wetland and riparian areas, fish and wildlife habitat, and vegetation. Additionally, Section 5 includes several goals and policies related to open space for the preservation of natural resources (Madera County 1995). The goals and policies that are pertinent to the Proposed Project include compliance wetlands policies of the USACE, USFWS, and CDFW; mitigation for loss of regulated and unregulated wetlands; conservation of upland areas adjacent to wetlands; protection of critical nesting foraging areas; and preservation of habitat for rare, threatened, endangered, and/or other special-status species. As discussed under Items a through d above, the Proposed Project could adversely affect plant and animal species of special concern, sensitive natural communities, federally protected wetlands, and wildlife movement corridors, posing a potential conflict with Madera County policies pertaining to the protection of biological resources. Implementation of Mitigation Measures BIO-1 through BIO-11_ above will reduce these impacts to levels considered less than significant under CEQA and thus avoid that conflict. Therefore, the impact is found to be less than significant with mitigation incorporated.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

No Habitat Conservation Plan, Natural Community Conservation Plan or other plans specific to the protection of habitat have been approved for the project study area.

4.5 Cultural Resources

4.5.1 Environmental Setting

A Cultural Resources Inventory Report was prepared by ECORP Consulting, Inc. (ECORP 2017b, Appendix C) for the Proposed Project to determine if cultural resources were preset in or adjacent to the Project area and assess the sensitivity of the Project area for undiscovered or buried cultural resources. The cultural context of the Project area including regional and local prehistory, ethnography, and regional and Project area histories can be found in the report in Appendix C. In July 2017, ECORP Consulting, Inc. was retained to conduct a cultural resources inventory of the proposed Rio Mesa Boulevard Project Area. The Project Area consists of linear area of ±93.76 acres proposed for construction of Rio Mesa Boulevard. The Project Area is east of the Yosemite Freeway (SR-41), north of Avenue 12, and south of Avenue 14. The San Joaquin River is to the east. The Project Area is located in the southeast and northeast quarters of Section 33; the southeast quarter of Section 28; the southwest, northwest, and northeast quarters of Section 27 of Township 11 South, Range 20 East, Mount Diablo Base and Meridian, as depicted on the 1964 Lanes Bridge U.S. Geological Survey (USGS) 7.5' topographic quadrangle map (Figures 1 and 2). It is also known as Assessor's Parcel Numbers (APN) 049-021-003, 049-021-007, 049-026-002, 049-026-004, 049-026-013, 049-026-014, 049-055-016, 049-055-017, 049-670-002, 049-670-004, 049-670-007, 049-670-010, 051-220-026, 051-220-018, 051-220-017, 051-220-024, 051-220-025, 051-220-020, 051-220-021, 051-220-023, 049-670-001, and 049-031-003.

The analysis of cultural resources was based on a records and literature search conducted at the Southern San Joaquin Valley Information Center (SSJVIC) of the CHRIS at California State University, Bakersfield on July 19, 2017 (NCIC search #17-368) and review of historical aerial photographs and maps of the vicinity. The results of the records search indicate that portions of the property have been previously surveyed for cultural resources; however, these studies were conducted in smaller segments, at different times, by different consultants, and as many as 41 years ago under obsolete standards. Therefore, a pedestrian survey of the APE was conducted for the current Project under current (2014) USACE protocols.

Field surveys were conducted August 14 through August 22, 2017. As a result of the field survey, one cultural resource was identified.

A search of the Sacred Lands File by the NAHC indicated the presence of Native American cultural resources in the Project Area. A record of all correspondence is provided in Appendix C. Any additional comments received after the submission of this report will be forwarded to the lead agencies for further consideration and appropriate action.

The National Register Information System (NPS 2016) failed to reveal any eligible or listed properties within the Project Area. The nearest National Register properties are located 9.4 miles southwest of the Project Area in the Highway City community of Fresno, California. A review of the Madera County local historical register did not reveal any resources in the vicinity.

Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. The nearest missions were in the vicinity of San Francisco Bay and included Mission San Francisco de Asis (Dolores) established in 1776 on the San Francisco peninsula, Mission Santa Clara de Asis at the south end of San Francisco Bay in 1777, Mission San Jose in 1797, Mission San Rafael, established as an *asistencia* in 1817 and a full mission in 1823, and Mission San Francisco Solano in Sonoma in 1823 (Castillo 1978; California Spanish Missions 2011). Presidios were established at San Francisco and Monterey. The Spanish took little interest in the area and did not establish any missions or settlements in the Central Valley.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers (Thompson and West 1880).

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Francisco (then known as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort (Bidwell 1971). Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in

January 1848 (Marshall 1971). The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land outside the land grants became federal public land which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862) (Robinson 1948).

Project Area History

The Project Area is situated in Madera County. In 1855 Fresno County was formed when it separated from Mariposa County. Madera County was formed in 1893 when it separated from Fresno County. The county line between Madera and Fresno Counties is the San Joaquin River. Madera is the Spanish term for wood. The county derives its name from the town of Madera, named when the California Lumber Company built a log flume to carry lumber to the Central Pacific Railroad that was constructed through Madera in 1876 (Madera County Historical Society 2012).

Territorially, Madera County is the area enclosed by the crest of the Sierra Nevada on the east, by the Chowchilla River on the north and by the San Joaquin River on the south and west. Almost midway through this belt of land flows the Fresno River, on which the City of Madera, the County seat, now stands. Madera history, before and after the formation of the county in 1893, has been determined by its three different physical areas and their resources: first, the belt of the foothill region in which gold was discovered and the first village established for the accommodation of settlers on the only available water supply. Second, the plains area, with little water supply under natural conditions that could furnish only pasture until such time as electric power warranted pumping or highly capitalized water storage furnished gravity water by canals to the farmer. Third, the higher Sierras, with timber, mineral, and opportunities for recreation and the accommodation of tourists in Yosemite (Madera County Historical Society 2012).

Paleontological Resources

A paleontological records search of online data published by the University of California, Museum of Paleontology (UCMP) was completed by ECORP Senior Archaeologist Wendy Blumel on October 2, 2017. The UCMP lists 235 paleontological specimens from two localities in Madera County; however, not all specimens in the UCMP collections have been cataloged and digitized and other specimens have likely been recorded within the vicinity of the Project area (UCMP 2017). The specific location of all recorded localities is available only to qualified paleontologists, and the location of these uncatalogued occurrences relative to the Project area is unclear without more extensive archival research. Of the 235 published specimens recorded within Madera County, six are fossil invertebrates and 229 are fossil vertebrates, primarily of from the Genus Equus (UCMP 2017). Twohundred and twenty-eight of the cataloged finds in Madera County were collected from one location, approximately 30 miles to the northwest of the Project area and are Pleistocene in age.

According to the Soil Survey Geographic Database for Madera County, California (NRCS 2017), eight soil units, or types, have been mapped within the study area. These are: (AsA) Alamo clay, 0 to 1 percent slopes; (RaA) Ramona sandy loam, 0 to 3 percent slopes; (RaB) Ramona sandy loam, 3 to 8 percent slopes; (RdC) Redding gravelly loam, 3 to 15 percent slopes; (RgC) Redding-Raynor complex, 3 to 15 percent slopes; (SaA) San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17; (WrB) Whitney and Rocklin sandy loams, 3 to 8 percent slopes; and (WRC) Whitney and Rockling sandy loams, 8 to 15 percent slopes (NRCS 2017a). All of these soils except Redding gravelly loam, 3 to 15 percent slopes and Redding-Raynor complex, 3 to 15 percent slopes and San Joaquin sandy loam, 0 to 3 percent slopes, are either considered hydric or have hydric components (NRCS 2017).

Surface sediments within the Project area consist primarily of Pleistocene nonmarine sediments (Qc) with small outcroppings of Tertiary nonmarine sediments (Tc) in the western portion of the Project area (Matthews and Burnett 1965). Due to inconsistency in naming sediment formations throughout the San Joaquin Valley, it is unclear whether or not the Pleistocene sediments in the Project area correspond with the Pleistocene non-marine Turlock Lake Formation that runs to the north and northwest of the Project area along the Sierra Nevada foothills. It appears that the Project area is located on the same broad outcrop of Pleistocene sediments labeled as the Turlock Lake Formation on the adjacent Geologic Map of the Raymond Quadrangle (Bateman et al. 1982). The Turlock Lake Formation has been known to contain vertebrate fossils associated with the Irvingtonian Age (1.8 million years to 240,000 years BP) (Marchand and Allwardt 1981).

A paleontological records search and literature review was also requested from the Los Angeles County Museum of Natural History (LACMNH) for the Project area. The results of the LACMNH records search (are included in Appendix E) did not find any fossil vertebrate localities that lie directly within the proposed project area boundaries; however, nearby locations within sedimentary deposits similar to those that occur in the project area may be present.

According to the geologic mapping, surface deposits for the entire proposed project area consist of soil on top of late Pleistocene deposits of the Riverbank Formation. LACMNH does not have any vertebrate fossil localities specifically designated as coming from the Riverbank Formation, but show the closest vertebrate fossil locality from similar deposits is LACM 7254, northwest of the proposed project area on the south side of Ash Slough northeast of Chowchilla, that produced a fossil specimen of elephantoid, Proboscidea.

4.5.2 Cultural Resources (V.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐

Discussion:

Field surveys were conducted August 14 through August 22, 2017 by ECORP Consulting, Inc. The field survey consisted of an intensive pedestrian survey of the entire Area of Potential Effects (APE) under the guidance of the Secretary of the Interior's Standards for the Identification of Historic Properties (NPS 1983) using transects spaced 15 meters apart (Figures 2 and 3). ECORP expended 16 person-days in the field. At that time, the ground surface was examined for indications of surface or subsurface cultural resources. During the field surveys one cultural resource was identified (RM-001). RM-001 is a wooden utility pole on an east-west-trending utility line crossing the Project Site. The pole is approximately 30 feet tall and contains a 1966 nail.

Power distribution pole lines are generally associated with historic-age residential properties or ranch and agricultural properties for which they would derive significance. This wood utility pole is not clearly associated with an individual residential, agricultural, or ranching property that has individual historical significance. It does not individually contribute to the broad patterns of history (NRHP Criterion A / CRHR Criterion 1). The wood utility pole is difficult to associate with specific individuals due to its lack of association with standing structures, and no information exists in the archival record to associate this resource with important individuals in history (NRHP Criterion B / CRHR Criterion 2). Archival research and field efforts show that this wood utility pole was built for cost and function, using standard materials, during a period when these poles were regularly installed throughout California. Research does not suggest that this utility pole embodies the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possesses high artistic values (NRHP Criterion C / CRHR Criterion 3). Finally, this wood utility pole does not provide important information in history or prehistory (NRHP Criterion D / CRHR Criterion 4). Consequently, RM-001 is evaluated as not eligible for inclusion in the NRHP and CRHR under all criteria and is not considered a significant resource as defined in §15064.5. Therefore, the proposed project will have a less then significant impact to historic resources.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐

Discussion:

Due to the location of the Project Area near the San Joaquin River and the likelihood of prehistoric archaeological sites located along perennial waterways, there exists the potential for buried prehistoric archaeological sites in the Project Area. During Project activities, there is a potential to unearth previously unidentified archaeological resources. To reduce the potential of significantly disturbing or damaging human remains, implementation of MM CR-1 would reduce impacts to less than significant.

Mitigation Measures

CR-1: If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required. If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, he or she shall immediately notify the applicable federal lead agency, the applicable CEQA lead agency, and applicable landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.

- If the find includes human remains, or remains that are potentially human, he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Madera County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California Public Resources Code, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (§ 5097.98 of the Public Resources Code). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (§ 5097.94 of the Public Resources Code). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the Public Resources Code). This will also include either recording the site with the NAHC or the appropriate information center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☒	☐	☐

Discussion:

Shallow excavations in the soil and Quaternary alluvial deposits exposed throughout the proposed project area will likely not uncover significant fossil remains. However, given that the majority of the Project area is located within Pleistocene nonmarine sediments and that 228 out of 235 fossil finds in Madera County are Pleistocene in age, the potential for the Project area to contain paleontological resources is considered high. There may be potential for excavation and activities to damage or destroy unknown paleontological resources during construction. This potential impact can be mitigated to a level that is less than significant with the implementation of Mitigation Measure PA-1.

Mitigation Measures

PA-1: If paleontological or other geologically sensitive resources be identified during any phase of project development, the construction manager shall cease operation at the site of the discovery and immediately notify the Madera County Community Development Department. The owner/applicant shall retain a qualified paleontologist to provide an evaluation of the find and to prescribe mitigation measures to reduce impacts to a less than significant level. In considering any suggested mitigation proposed by the consulting paleontologist, the Community Development Department shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, land use assumptions, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the project site while mitigation for paleontological resources is carried out.

d) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☒	☐	☐

Discussion:

Please see discussion 4.5.2(b) above. With implementation of MM CR-1 impacts would be less then significant.

4.6 Geology and Soils

4.6.1 Environmental Setting

Geomorphic Setting

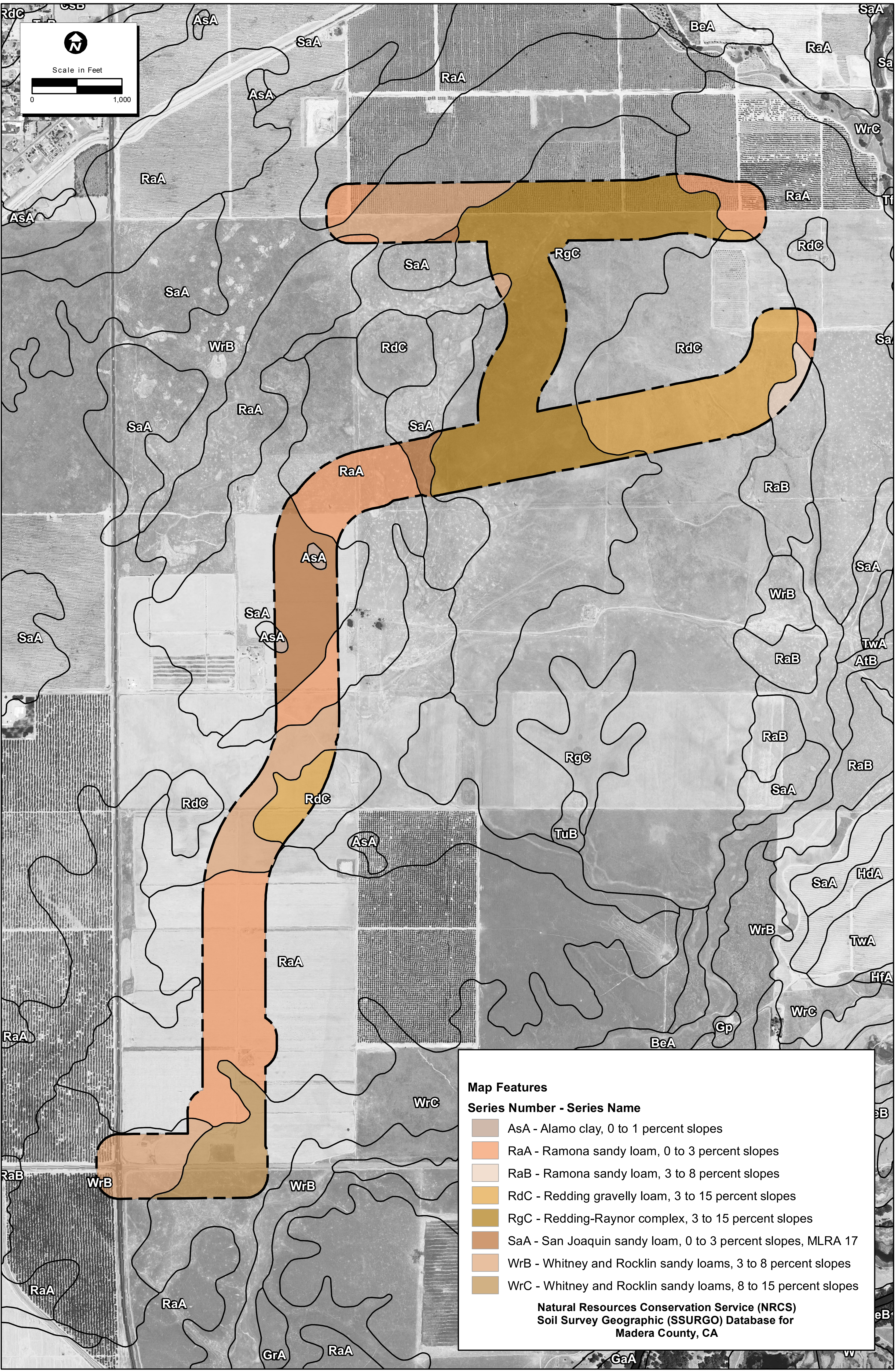
The Rio Mesa Planning Area (Rio Mesa) is located along the southern boundary of Madera County, approximately 30 miles west of the Sierra Nevada foothills, one mile northeast of the San Joaquin River, and two miles south of Little Table Mountain. Little Table Mountain forms a plateau approximately 350 feet above the surrounding plain. The flatter areas within Rio Mesa transition to rolling hills and ridges in the northeast. The eastern edge of Rio Mesa adjacent to the San Joaquin River is characterized by 70- to 100-foot bluffs and vegetation. The San Joaquin River is the primary natural feature in project vicinity, consisting of a 366-mile river through the Fresno-Madera metropolitan area and the entire San Joaquin Valley. The Project Site is between 362 and 550 feet above mean sea level, with rolling terrain of varying grades with occasional exposures of nonmarine rock formations. The geologic deposits consist of alluvial fan sediments including claystone, sandstone, and conglomerate of the Ione Formation of Eocene epoch.

Regional Seismicity and Fault Zones

An “active fault,” according to California Department of Conservation, Division of Mines and Geology, is a fault that has indicated surface displacement within the last 11,000 years. A fault that has not shown geologic evidence of surface displacement in the last 11,000 years is considered “inactive.” The Melones fault, which lies approximately 35 miles to the north, is the closest known potentially active fault to the Project Site.

Soils

The soil underlying the Project Site is Alluvial Fan Deposits: sediments that were deposited there by the action of rivers eroding sedimentary rocks. Soil groups are related to the substrate on which they are developed. The Alluvial Fan Deposits soil group is subdivided into soil associations based on a variety of distinguishing characteristics, such as texture, slope, and agricultural capability. According to the Soil Survey Geographic Database for Madera County, California (NRCS 2017a), eight soil units, or types, have been mapped within the study area. These are: (AsA) Alamo clay, 0 to 1 percent slopes; (RaA) Ramona sandy loam, 0 to 3 percent slopes; (RaB) Ramona sandy loam, 3 to 8 percent slopes; (RdC) Redding gravelly loam, 3 to 15 percent slopes; (RgC) Redding-Raynor complex, 3 to 15 percent slopes; (SaA) San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17; (WrB) Whitney and Rocklin sandy loams, 3 to 8 percent slopes; and (WRC) Whitney and Rockling sandy loams, 8 to 15 percent slopes (NRCS 2017a). All of these soils except Redding gravelly loam, 3 to 15 percent slopes and Redding-Raynor complex, 3 to 15 percent slopes and San Joaquin sandy loam, 0 to 3 percent slopes, are either considered hydric or have hydric components (NRCS 2017b). (Figure 7. NRCS Soil Types)



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Soils_and_Geology\Soils\RMRA_Soils_V3.mxd (MAG):chinkelman 9/19/2017

Map Date: 9/19/2017
Photo Source: Madera County NAIP 2014

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 7. Natural Resource Conservation Service Soils Types

2017-089 Rio Mesa Boulevard Road Alignment

4.6.2 Geology and Soils (VI.) Environmental Checklist and Discussion

a) Would the project expose people or structures to 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 Impact ☐	Less than Significant With Mitigation Incorporated ☐	Less than Significant Impact ☐	No Impact ☒
ii) Strong seismic ground shaking?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporated ☐	Less than Significant Impact ☐	No Impact ☒
iii) Seismic-related ground failure, including liquefaction?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporated ☐	Less than Significant Impact ☒	No Impact ☐
iv) Landslides?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporated ☐	Less than Significant Impact ☒	No Impact ☐

Discussion:

i and ii The closest known active fault to the Proposed Project Site is the Melones fault, about 35 miles north of the Project. The San Joaquin fault, about 55 miles west, is the next closest known active fault. There are no faults in an Alquist-Priolo Earthquake Fault Zone in the vicinity of the Project Site. Because none of these faults cross or trend toward the Project Site, fault-line surface rupture is not considered a hazard. Consequently, the Proposed Project would have no impact regarding exposing people or structures to rupture of a known earthquake fault.

iii) The Project Site contains soils that are not prone to liquefaction. Potentially unstable soils revealed during excavation are required by provisions of the Building Code to be removed and replaced, or otherwise treated to provide appropriate foundation support and to protect foundations from failure through liquefaction (see also information below under Impact 4.6-6). Transportation and underground utility infrastructure would be required to comply with County, State, and/or Federal design criteria and/or other accepted non-building structure standards to reduce the risks associated with seismically induced ground failures. Therefore, the Proposed Project would have a less-than-significant impact regarding exposing people or structures to damage resulting from seismic-related ground failure (including liquefaction). No mitigation is required.

iv) The Project Site primarily consists of gently sloping land, and, according to the General Plan background Report Map, contains or is adjacent to some areas of landslide risk. As such, before construction on the Proposed Project can begin, the slope evaluations must be conducted by registered soil professionals, and the measures to eliminate inappropriate slope conditions must be applied (CGS 1997). Compliance with the 2016 California Building Code (CBC) would result in a less-than-significant impact regarding exposing people or structures to hazardous landslide conditions. No mitigation is required.

b) Would the project result in substantial soil erosion or the loss of topsoil?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

Best Management Practices (BMPs) are included as part of the Storm Water Pollution Prevention Plan (SWPPP) prepared for the Proposed Project and would be implemented to manage erosion and the loss of topsoil during construction-related activities (see Hydrology and Water Quality (4.9) Environmental Checklist and Discussion). Soil erosion impacts would be reduced to a less than significant impact.

c) Would the project 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?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

The project area is relatively flat, lacking steep slopes, and landslides are not anticipated. The potential for soil liquefaction related to earthquake shaking is considered minimal due to the depth to groundwater, 10 to over 15 feet below mean sea level and therefore 390 to 485 feet below ground surface. Furthermore, the potential for differential settlement or lateral spreading during or after seismic events at the Project site is considered low. This is because the potential for earthquake hazard in the Project area is considered low. Therefore, the proposed Project would have a less than significant impact related to landslide, lateral spreading, subsidence, liquefaction, or collapse. No mitigation is required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐

Discussion:

The existence of variably textured alluvial deposits in the Project area increases the possibility of expansive soils occurring randomly and causing foundation-stability issues for dwellings, roads, bridges, and utilities. According to soil data from the Project area provided by the USDA-NRCS, the Project site is partially underlain by soils with high clay content, which are usually expansive. Minerals in certain clays swell with increased moisture content and hen contract during dry periods. Due to higher percentages of claypan in some of the soils, the shrink-swell potential within the project is moderate-high.; however, since these soils are located at shallow depths, they are conducive to roadway development. Properly designed roads can help prevent potential damage caused by high shrink-swell potential. The Proposed Project would be designed so that grades are constructed in such a way as to prevent water from collecting on or adjacent to pavement, thereby discouraging soil saturation along the roadway. Therefore, the Proposed Project would have a less-than-significant impact regarding exposing people or property to the hazards of expansive soils. No mitigation is required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion:

The Proposed Project does not propose the use or construction of septic tanks or alternative wastewater disposal systems; therefore, there would be no impact.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.7 Greenhouse Gas Emissions

An evaluation of Greenhouse Gas Emissions and CalEEMod version 2016.3.1 modeling was prepared by ECORP and is presented in the following discussion. See Appendix A for emission model outputs.

4.7.1 Environmental Setting

Greenhouse gases (GHGs) are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and chlorofluorocarbons, creates a blanket around the earth that allows light to pass through but traps heat at the surface, preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

4.7.2 Greenhouse Gas Emissions (VII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Discussion:

Short-Term Construction Impacts

Construction-related activities that would generate GHGs include worker commute trips, haul trucks carrying supplies and materials to and from the Project site, and off-road construction equipment (e.g., dozers, loaders, excavators). **Table 4.7-1** illustrates the specific construction-generated GHG emissions that would result from construction of the Project.

Table 4.7-1. Construction-Related Greenhouse Gas Emissions (Metric Tons per Year)

Emissions Source	CO_2e
2020	2,070
2024	1,931
Total	4,001

Source: CalEEMod version 2016.3.1. See ***Appendix A*** *for emission model outputs.*

As shown in **Table 4.7-1**, Project construction would result in the generation of approximately 4,001 metric tons of CO_2e over the course of construction. The SJVAPCD does not provide guidance for analyzing GHG construction emissions. As previously noted in Section 4.3, *Air Quality*, mitigation measure **AQ-1** will require the use of the most efficient heavy-duty diesel-powered equipment to implement the Project. This measure would minimize construction-related emissions. Also, the 2016 Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 6 (also known as the California Energy Code) requires the diversion of 75 percent of construction waste from landfills, which also reduces emissions. Since GHG construction emissions are temporary and construction is not an on-going emission source, the impact is less than significant.

Long-Term Operational Impacts

The Project would not generate quantifiable GHG emissions from long-term operations. The Project does not propose any new buildings and therefore no permanent source of stationary source emissions. In addition, once completed the Project would not result in a permanent increase in traffic. The Proposed Project would accommodate existing and predicted traffic demands and uphold Madera County's goals to reduce traffic congestion, improve safety on roadways, and provide better access to regional transportation routes. The Proposed Project has been designed to accommodate approved development as well as provide congestion relief.

Since the Project would be designed to accommodate additional traffic volumes and would not directly generate new traffic or increase vehicular trips, a source of GHG, the Proposed Project would not exceed SJVAQMD thresholds of significance; therefore, the Project will have less than significant impact.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion:

None of the components of the Proposed Project would include the provision of new permanent stationary or mobile sources of emissions. Therefore, by its nature, the Project would not generate quantifiable GHG emissions from long-term operations. The Project does not propose any new buildings and therefore no permanent source of stationary source emissions. In addition, once completed the Project would not result in a permanent increase in traffic. The Proposed Project would accommodate existing and predicted traffic demands and uphold Madera County's goals to reduce traffic congestion, improve safety on roadways, and provide better access to regional transportation routes. The Proposed Project is part of the Rio Mesa Area Plan (Circulation Concept Plan) which has been planned and approved since 1995. The Rio Mesa Area Plan was envisioned in the 1994 Madera County General Plan Update for phased urban development over the next ten to twenty years, though much development has yet to occur. Within the Rio Mesa Area Plan are three approved large-scale residential development projects and the Proposed Project has been designed to accommodate these approved developments as well as provide congestion relief for other areas in the vicinity already under construction.

Since the Project would be designed to accommodate additional traffic volumes and would not directly generate new traffic or increase vehicular trips, a source of GHG emissions, the Proposed Project would not conflict with or obstruct implementation of any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. This impact would be less than significant.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.8 Hazards and Hazardous Materials

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined by the California Health and Safety Code, Section 25501 as follows:

> *"Hazardous material" means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste,*

> *and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment*.

A hazardous material is defined in 22 CCR Section 662601.10 as follows:

> *A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed.*

Most hazardous materials regulation and enforcement in San Joaquin County is managed by the San Joaquin County Environmental Health Department, which refers large cases of hazardous materials contamination or violations to the Central Valley Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). It is not at all uncommon for other agencies, such as the SJVAPCD and both the federal and state Occupational Safety and Health Administrations, to become involved when issues of hazardous materials arise.

Under Government Code Section 65962.5, both the DTSC and the State Water Resources Control Board (SWRCB) are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites. The Project sites are not listed by the DTSC or SWRCB as a hazardous substances site on the list of hazardous waste sites compiled pursuant to Government Code Section 65962.5 ("Cortese List"). A search of the DTSC (2017) and SWRCB (2017) lists identified no open cases of hazardous waste violations within a mile of the Project sites.

4.8.1 Hazards and Hazardous Materials (VIII.) Environmental Checklist and Discussion

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

Some hazardous materials, such as diesel fuel, would be used at the site during construction. The transport of hazardous materials by truck is regulated by federal safety standards under the jurisdiction of the U.S. Department of Transportation. The use of such materials would not create a significant hazard to the public and impacts would be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b) Would the project 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?	☐	☐	☒	☐

Discussion:

On-site storage and/or use of large quantities of hazardous materials capable of affecting soil and groundwater are not proposed. The potential risk associated with accidental discharge during use and storage of equipment-related hazardous materials during construction of the proposed roadway is considered low. Potential risks associated with the handling of hazardous materials during construction would be addressed through the implementation of Best Management Practices (BMP's). The potential for the release of hazardous materials into the environment is unlikely. A less than significant impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

Discussion:

There are no schools located within a one-quarter mile of the project site. The nearest school to the project site is Fugman Elementary School, which is located approximately 2.5 miles to the southeast. Please see the response to VIII. b) above. Impacts would be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the project 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?	☐	☐	☐	☒

Discussion:

A search of the Department of Toxic Substances Control's (DTSC) Hazardous Waste and Substance List (Cortese List) and EnviroStor online database and the State Water Resources Control Board's (SWRCB) GeoTracker online database was conducted for the project area (DTSC 2017a and 2017b; SWRCB 2017). The searches revealed no known hazardous material sites within the project site. However, one leaking underground storage tank (LUST) cleanup site located at the Sumner Peck Ranch was identified within the project vicinity. This LUST cleanup site (RB Case# 5T20000230, Loc Case # PR0009723) has a Completed – Case Closed status as of July 22, 2016. Therefore, the Proposed Project would not be located on a site which is included on a list of hazardous material sites. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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 or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

Discussion:

The closest public use airport to the project site is Fresno Yosemite International Airport (FAT) located approximately 12 miles south of the project site. The project site is not located within the Safety Compatibility Zones for FAT (Fresno County ALUC 2012). Due to the distance of the project site to a public use airport no hazards to people residing or working in the project area would result. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

Discussion:

The project site is located approximately .75 miles north of Arnold Ranch Airport. The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa. The Proposed Project would not construct facilities that would affect the approach/departure path of the private airstrip. Therefore, no impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
g)	Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

Discussion:

The Madera County Emergency Operations Plan sets forth policies to address and respond to extraordinary emergency situations associated with natural disasters, technological incidents, weapons of mass destruction, and national security emergencies affecting Madera County (County of Madera 2010). The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa where no road currently exists. This would allow for better emergency access to Rio Mesa. Therefore, the construction and operation of the Proposed Project would not interfere with an emergency response or evacuation plan. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
h)	Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion:

According to the Draft Fire Hazard Severity Zones in Local Responsibility Area map published by CALFIRE, the project site is located in moderate and unzoned fire hazards severity zones of local responsibility in Madera County. Additionally, the Rio Mesa Area Plan identifies wildfire hazards at higher elevations in the easterly portion of the planning area, due to limited accessibility and flammable natural vegetation. The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within a westerly portion of Rio Mesa providing access to the area (CALFIRE 2007). Impacts would be less than significant.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.9 Hydrology and Water Quality

4.9.1 Environmental Setting

Regional Hydrology

The Project Site is located within the San Joaquin River Basin, San Joaquin Valley Floor Hydrologic Unit. The San Joaquin River Basin is a 15,880-square-mile watershed that drains the entire San Joaquin watershed. The San Joaquin River Basin is an alluvial valley bounded by the Sierra Nevada Mountains to the east, the Tehachapi Mountains to the southeast, and the South Coast Ranges to the west. Other surface water bodies in the vicinity include the Chowchilla River, the Fresno River, irrigation canals, and small creeks. The 30-year average annual temperature is 64.3 degrees Fahrenheit (°F) with the lowest average monthly temperature occurring during December (46.6°F) and the highest average monthly temperature occurring during July (82.9°F) (WRCC 2007). Although the San Joaquin Valley does not receive a great deal of annual precipitation, precipitation in the Sierra Nevada Mountains averages 35 inches per year and is a major contributor to San Joaquin River flows (CDWR 2005a). The mountain ranges surrounding the San Joaquin Valley isolate it from marine influences, resulting in an arid to semi-arid climate (CDWR 2005a). Average annual precipitation28 is approximately 11.6 inches per year at the closest rain gauge to the Project Site (WRCC 2007).

Mean monthly flow on the San Joaquin River from 1942 through the present ranged from a low of 234 cubic feet per second (cfs) in November to 1,804 cfs in May at the USGS San Joaquin River below Friant Dam gauge station (USGS 2007). Mean monthly flows for individual years have been as low as 30 cfs (January 1966) and as high as 9,144 cfs (January 1997). Seasonal changes in flow on the San Joaquin River correspond to precipitation variations and to variations in water supply withdrawals for municipal, agricultural, and industrial uses.

Site Hydrology and On-Site Drainage

The Project Area which consists of the Project Site and a 250-foot buffer contains several hydrologic features consisting of vernal pools, seasonal wetlands, seasonal wetland swales, and ditches. In general, the Project Area is characterized by gently rolling terrain in the north portion and flat terrain in the southern portion. Elevation ranges within the Project Area range from approximately 380 to 470 feet above msl.

4.9.2 Hydrology and Water Quality (IX.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

Discussion:

Construction Water Quality Impacts

The Proposed Project involves construction of a new roadway. The SWRCB requires dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit 99-08-DWQ). The Project footprint will increase the amount of impervious surface at the Project site. Therefore, the Project will need to obtain coverage under Construction General Permit Order 2009-0009-DWQ adopted September 2, 2009. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation.

The Construction General Permit requires the development and implementation of a SWPPP. The SWPPP should contain a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list best management practices (BMPs) the discharger will use to protect stormwater runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program, a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of the BMPs.

In addition, measures would be included in the grading plans to minimize erosion potential and water quality degradation of the Project area. Additionally, the State has published a set of BMPs for both pre- and post-construction periods, which would be applied to the Project. The County would identify the appropriate BMPs for the Project. Compliance with the provisions of the best management practices would reduce impacts associated with water quality standards and discharge requirements to a less than significant level.

Operational Water Quality Impacts

The Proposed Project would result in an increase in impervious surfaces due to the new roadways. Thus, the types, quantities, and timing of contaminant discharges in stormwater runoff would be slightly altered relative to existing conditions. The amount of contaminants discharged in stormwater drainage varies based on a variety of factors, including pollutants on trail surfaces and the amount of rainfall. Development of the proposed Project would be subject to the requirements of the General Permit Permit 2009-009-DWQ and Storm Water Pollution Prevention Plan (SWPPP), which requires that the County impose water quality and watershed protection measures for all development projects and prohibits discharges from causing violations of applicable water quality standards or from resulting in conditions that create a nuisance or water quality impairment in receiving waters. The General Permit requires a SWPPP to be developed and implemented and the SWPPP to identify best management practices for construction and operation in Project design for new construction. Implementation of the General Permit, SWPPP and Best Management Practices would reduce water quality impacts to a less than significant level.

b)	Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
		☐	☐	☒	☐

Discussion:

The Proposed Project would result in an increase in impervious surfaces in the area, which would alter the rate of infiltration at the Project site. However, impacts to groundwater resources would be minimal, as the roadway alignment does not contain elements that would add to or draw from groundwater supplies. Additionally, the Proposed Project would not be constructed immediately above any preexisting wells, nor would areas known to contain wells be disturbed by Project construction. Therefore, impacts to groundwater supplies would be less than significant.

c)	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
		☐	☐	☒	☐

Discussion:

As detailed in Appendix B of this IS/MND (Biological Resources Assessment), ECORP conducted an Aquatic Resources Delineation for the project site in support of a future request for USACE verification of that delineation. Preliminary results of the Aquatic Resources Delineation are discussed in Section 44.3 of this document as well as Appendix B. Findings of the preliminary delineation show no stream or river present with the project Study Area. In addition, and as noted above, measures shall be included in the project grading plans to minimize erosion potential and water quality degradation of the Project area and offsite water courses. Therefore, the impact of the project on streams or rivers due to erosion or siltation is considered less than significant.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

As discussed under item (c) above, the Proposed Project will not alter the course of any river or stream. As discussed above in the discussion for Item (a), above, the Proposed Project would result in an increase in impervious surfaces due to the new roadways and would result in the quantities and timing of stormwater discharges being slightly altered relative to existing conditions. As noted, the Construction General Permit for the project will require the development and implementation of a SWPPP which will contain a site map showing the construction site perimeter, existing and proposed roadways and facilities, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project.

Given the nature of the project (roadways and below-grade infrastructure), topography of the project site, isolation from any streams or rivers, and expected implementation of the SWPPP, the impact of the project on- or off-site flooding would be less than significant.

e) Would the project 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?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

The Proposed Project would result in an increase of impervious surfaces on undeveloped agriculturally zoned land thereby resulting in an increase of surface runoff emanating from the project site. Surface runoff emanating from the project site would be directed to underground roadway drainage facilities that would be able to accommodate anticipated flows. Thus, runoff volumes associated with the Proposed Project would not exceed the capacity of the proposed drainage facilities. Although the Proposed Project could result in polluted runoff, compliance with regulatory requirements to water quality and BMPs (see response to item (a) above) would minimize these impacts to a less than significant level.

f) Would the project otherwise substantially degrade water quality?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

See Response to item (a) above. A less than significant impact would occur.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The Proposed Project does not include housing and therefore does not place housing within any flood zones. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map's (FIRM) for the project area (Panel Nos. 06039C1220E and 0639C1210E), the project area is located in Flood Zone X. Flood Zone X is characterized as areas outside of the 0.2% chance flood plain (FEMA 2017). Additionally, the County of Madera General Plan Background Report designates the project area as Zone X-Minimal (500-Year) Flood Hazard Area (County of Madera 1995b). The Proposed Project would construct a new north-south roadway consistent with a secondary arterial (4-lane undivided). Therefore, the Proposed Project would not place structures within a 100-year flood hazard area. No impact would occur.

h) Would the project place within a 100-year flood hazard area structures that would impede or redirect flood flows?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

See Response to item (g) above. No impact would occur.

i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The nearest dam to the project site within Madera County is Friant Dam, located approximately 5.25 miles northeast of the project site. However, the project site is not located in the Friant Dam inundation area (County of Madera 1995b). No impact would occur.

j) Would the project be subject to inundation by seiche, tsunami, or mudflow?	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

According to the Madera County General Plan Background Report, seiches are not considered to be of concern in Madera County (County of Madera 1995b). The project area is located 30 miles west of the Sierra Nevada Foothills and approximately 110 miles inland from the Pacific Ocean, therefore, the project area would not be subject to a seiche or tsunami. The project area is relatively flat and would not be subject to mudflows. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.10 Land Use and Planning

4.10.1 Environmental Setting

The project site is located within Rio Mesa in southeast Madera County. Rio Mesa is primarily comprised of designated Mixed Use, Residential, Commercial/Industrial, Open Space, and Agricultural land uses. The project area mainly consists of agricultural land bounded by the San Joaquin River to the east and State Route 41 to the west.

The Project site is surrounded by properties designated Low (LDR), Medium (MDR), and High (HDR) Density Residential to the north, Very Low (VLR), Low (LDR), and Medium (MDR) Density Residential to the east, Open Space (OS), Light Industrial (LI), and Highway Service Commercial (HSC) to west, and Light Industrial (LI) I land uses to the south (County of Madera 1995a). The project site is located within an Agricultural zoning district (County of Madera 2017).

4.10.2 Land Use and Planning (X.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project physically divide an established community?	☐	☐	☐	☒

Discussion:

The project vicinity is currently undeveloped but would be developed consistent with the Rio Mesa Area Plan. The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway within Rio Mesa. The planned roadway would provide access and connections to future development within Rio Mesa; a beneficial impact. No impact would occur.

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Discussion:

The project site is located within an Agricultural Rural Valley – 20 Acres (ARV-20) and Agriculture Rural Exclusive (ARE-40) zoning district and a Right-of-Way land use designation (County of Madera 1995a; 2017). The Proposed Project would construct a new north-south secondary arterial (4-lane undivided) roadway along a right-of-way designation within Rio Mesa. The Proposed Project would be consistent with the Rio Mesa Area Plan. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion:

According to the Rio Mesa Area Plan the project site is not located within a Biological Resource Area or a Significant Open Space. Currently, no Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs) apply to the project site. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.11 Mineral Resources

4.11.2 Mineral Resources (XI.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Would the project 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?	☐	☐	☐	☒

Discussion:

According to the Rio Mesa Area Plan the project site would not be located in a mineral resource zone (County of Madera 1995a). The Proposed Project would not 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. There are no mining activities being conducted on the site; no mining activities are planned for this site. There are no current future mining activities proposed in the vicinity of the project site. No impact would occur.

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
b) Would the project 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?	☐	☐	☐	☒

Discussion:

The Proposed Project would not 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, because no mining operations exist on or in the vicinity of the project site (County of Madera 1995a). No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.12 Noise

An evaluation of Noise and Noise Level Contour modeling was prepared by ECORP and is presented in the following discussion. See Appendix D for emission model outputs.

4.12.1 Environmental Setting

Noise Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels (in Ldn/CNEL).

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks, and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Mobile transportation sources, such as highways, and hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source (EPA 1971).

Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the “line of sight” between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise, but are less effective than solid barriers.

Vibration

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity or root mean square velocity. These measure maximum particle at one point or the average of the squared amplitude of the signal, respectively. Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual’s sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

4.12.2 Noise (XII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐

Discussion:

Short-Term Construction Impacts

Noise levels in the project area would temporarily increase due to short-term construction activities. Construction-related noise increases would be temporary and would vary depending on the type of activities and equipment used.

Excavation and grading activities are typically involved in the site preparation phase of the project and usually generate the highest noise levels. Construction-related noise impacts would typically occur during the initial earthwork phases. These phases of construction have the potential to create the highest levels of noise. Typical noise levels generated by construction equipment are shown in **Table 4.12-1**. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

Table 4.12-1 Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 Feet from Source	
	L_{max}	L_{eq}
Air Compressor	80	76
Backhoe/Front End Loader	80	76
Compactor (Ground)	80	73
Concrete Mixer Truck	85	81
Concrete Mixer (Vibratory)	80	73
Concrete Pump Truck	82	75
Concrete Saw	90	83
Crane	85	77
Dozer/Grader/Excavator/Scraper	85	81
Drill Rig Truck	84	77
Generator	82	79
Gradall	85	81

Equipment	Typical Noise Level (dBA) at 50 Feet from Source	
Hydraulic Break Ram	90	80
Jackhammer	85	78
Impact Hammer/Hoe Ram (Mounted)	90	83
Pavement Scarifier/Roller	85	78
Paver	85	82
Pneumatic Tools	85	82
Pumps	77	74
Truck (Dump/Flat Bed)	84	80

Source: FTA 2006

As depicted in **Table 4.12-1**, noise levels associated with individual construction equipment used for typical construction projects can reach levels of up to approximately 83 dBA L_{eq} at a distance of 50 feet. The nearest sensitive receptor is a residence approximately 500 feet away from the construction footprint at the central portion of the Project area. (While there is a single residential structure located to the east of the central portion of the Project area, this structure is uninhabitable.) Based on an attenuation rate of 6 dBA per doubling of distance from the source, the nearest sensitive receptor will experience noise levels of less than 65 dBA L_{eq}.

Section 9.58.020-G. of the County’s Code of Ordinances regulates construction noise by limiting construction activities to the hours of 7 a.m. and 7 p.m. Monday through Friday and 9 a.m. and 5 p.m. on Saturdays. Construction activities are prohibited on Sundays. The County’s Code of Ordinances does not establish a numerical noise level threshold. Since there are no numerical thresholds for construction noise, and since construction is regulated to only occur between the hours of 7 a.m. and 7 p.m. Monday through Friday and 9 a.m. and 5 p.m. on Saturdays per Section 9.58.020-G. of the County’s Code of Ordinances, construction noise associated with the Project would not exceed Madera County noise standards and is less than significant.

Long-Term Operational Impacts

The sole source of operational noise impacts as a result of the Project is from the creation of a traffic corridor where none previously existed. Predicted traffic noise levels were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108). According to the Traffic Impact Study (KD Anderson 2017) (Appendix D), approved development in the area would generate 5,712 average daily trips (ADT) at the time Rio Mesa Boulevard is constructed. Since the majority of these trips would result from vicinity residential development, half of the estimated ADTs are assumed to be “leaving” the area and half are assumed to be “returning”. Based on the trip distribution assumptions identified in the Traffic Impact Study (KD Anderson 2017), 55 percent of the “returning” trips would travel on Rio Mesa Boulevard (1,571) and 35 percent of the “leaving” trips would traverse Rio Mesa Boulevard (1,000). Therefore, it is estimated that Rio Mesa Boulevard will accommodate a total of 2,571 ADT at the time of completion.

Based on this information, the predicted noise levels at the nearest sensitive receptor would be 42.3 dBA L_{dn}.

Policy 7.A.2 of the Madera County General Plan states that noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed 60 dB L_{dn} within the outdoor activity areas of existing or planned noise-sensitive land uses and 45 dB L_{dn} in interior spaces of existing or planned noise-sensitive land uses. Since the nearest sensitive receptor will experience exterior noise levels of 42.3 dBA L_{dn}, this impact is considered less than significant.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☒	☐

Discussion:

Sources of earthborne vibration include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, earthborne vibration may be described by amplitude and frequency. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities.

Construction activities are expected to use equipment such as excavators, graders, scrapers, dozers, and loaders. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. **Table 4.12-2** displays vibration levels for typical construction equipment.

Table 4.12-2 Typical Construction Equipment Vibration Levels

Equipment Type	Peak Particle Velocity at 575 Feet (inches per second)
Large Bulldozer	0.0008
Loaded Trucks	0.0007
Jackhammer	0.0003
Small Bulldozer/Tractor	0.00003

Source: FTA 2006; Caltrans 2004

It is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest structure. The nearest off-site structure to any of the construction areas is a building adjacent to the occupied residence, located 575 feet to the west. As shown in **Table 4.12-2**, ground vibration generated by heavy-duty equipment would not be anticipated to exceed approximately 0.0008 inches per second peak particle velocity at 575 feet.

Section 9.58.020-F. of the County's Code of Ordinances states that operating or permitting the operation of any device that creates a vibration on adjacent private property which is above the vibration perception threshold of 0.1 inches per second is prohibited. As shown, the predicted vibration levels during construction at the nearest off-site structures would not exceed recommended criteria.

Once operational, the Project would not be a source of groundborne vibration; therefore, the impact would be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

Discussion:

See discussion above in Issue a), Long-Term Operational Impacts.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

Discussion:

See discussion above in Issue a), Short-Term Construction Impacts.

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
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 or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion:

Sierra Sky Park Airport is a privately owned, public-use airport located 7.5 miles southwest of the project site. Therefore, the Project is also not located within 2 miles of any existing public airports. Additionally, the Project would not introduce new people residing or working in the project area. No noise-related impact would occur in this regard.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion:

Arnold Ranch Airport is a private jet airport located 0.75 miles south of the Project site. The Project would not introduce new people residing or working in the project area. No noise-related impact would occur in this regard.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.14 Population and Housing

4.14.1 Population and Housing (XIV.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project induce substantial 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)?	☐	☐	☒	☐

Discussion:

The Proposed Project does not consist of the construction of new housing or businesses and therefore is not anticipated to directly or indirectly induce population growth in the area. Additionally, the Proposed Project would construct roadway infrastructure in the Rio Mesa area and would not generate a substantial permanent increase in employment opportunities capable of inducing population growth. A less than significant impact would occur.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The Proposed Project would be located in an area of Rio Mesa that is currently undeveloped. The Proposed Project involves the construction of roadway infrastructure and does not involve housing. No impact would occur.

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The Proposed Project consists of the construction of roadway infrastructure and would not include the removal of housing; therefore, it would not displace people. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.15 Public Services

4.15.1 Environmental Setting

Police Services

Law enforcement in unincorporated Madera County is provided by the Madera County Sheriff's

Department (MCSD). The closest police station to the Project Site is the Madera County Sheriff Sub-Station on Avenue 12, approximately 5 miles to the southwest. The Project Site falls within the bounds of Beat 3, a police beat that is staffed by a single deputy at any given time (Bernard 2007). Police shifts are 12 hours long.

The MCSD strives to maintain a ratio of 1.2 deputies per thousand citizens within its service area (Bernard 2007). In addition, it attempts to staff at least one sergeant for every five deputies and 0.6 support staff per thousand citizens.

To provide an acceptable level of service, MCSD requires a wide range of equipment including, but not necessarily limited to, patrol vehicles outfitted with emergency equipment, radio communications, rifles, shotguns, on-board computers, evidence collection materials, and traffic control devices. In addition, each officer must have personal equipment that includes, but is not necessarily limited to, a firearm, firearm magazines, ammunition, pepper spray, handcuffs, portable radio, ballistic vest, helmet, personal protective gear, and investigation equipment.

Fire Services

Fire protection services to unincorporated Madera County are provided by the Madera County Fire

Department (MCFD). The MCFD also provides backup fire protection to the City of Madera and the Central California Women's Facility (located in northern Madera County). The closest fire station to the Project Site is Bonadelle Ranchos Station, Station No. 19, approximately 6.4 miles to the west. Station No. 3 and Station No. 6 are also within 15 miles of the Project Site.

The Department is administered and fire suppression personnel are provided through a contract with CAL FIRE, which is part of the California Department of Forestry and Fire Protection (CDF). Fire inspection, clerical, and mechanical support personnel, however, are directly employed by the County. The MCFD measures the adequacy of its fire protection services using Insurance Services Office (ISO) standards. These standards rate factors such as average first alarm response time, the number of available fire-fighting staff, the distribution of hydrants, and the reliability and discharge of the hydrant water supply. The ISO scale ranges from 1 to 10, with ISO 1 representing exemplary public protection and ISO 10 indicating poor fire protection service. The current ISO standard for the Project Site is ISO 10 unprotected (Maggio 2008), and according to the Madera County General Plan, protection for rural areas should meet or exceed an ISO 8 threshold (Policy 3.H.1). Average first alarm response times to the Project Site are estimated to be up to 20 minutes (Rowney 2007), which meets the General Plan threshold of 20 minutes for rural areas (Policy 3.H.2). The MCFD does not use a firefighter-to-population staffing ratio as an indicator of adequate/inadequate service.

Schools

The Project Site is located within the boundaries of the Golden Valley Unified School District (GVUSD) and the Chawanakee Unified School District (CUSD). The GVUSD includes a very small area of the Project Site south of Avenue 14. The GVUSD includes two elementary schools, one middle school, one standard high school, one continuation high school, and one child development center.

Parks

There are several public parks and recreational areas in the vicinity of the Project Site. The Project Site is approximately 45 miles south of the 750,000-acre Yosemite National Park and 16 miles west of the 1.3 million-acre Sierra National Forest, which includes the John Muir Wilderness, Nelder Grove, and the Devil's Postpile National Monument. Millerton Lake State Recreation Area, Hensley Lake Recreation Area, and Eastman Lake are approximately 5, 13, and 20 miles from the Project Site, respectively. Shaver Lake and Bass Lake are also approximately 30 miles from the site. South of the Project Site, in the City of Fresno, are nine city parks that fall within a 10-mile radius of the

Project Site: Fort Washington Beach Park, Woodward Park, Kaiser Park, Belcher Park, Holman Park, Rotary East Park, Robinson Park, Oso de Oro Lake Park, and El Dorado Park.

There is no existing publicly owned or publicly accessible open space on the Project Site other than some banks of the San Joaquin River. The majority of the Project Site is devoted to agricultural and grazing uses.

4.15.2 Public Services (XV.) Environmental Checklist and Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☒

Discussion:

Fire Protection and Police Protection

The Proposed Project would not induce population growth and does not include any components that would result in an increased demand for fire protection or police protection. The Proposed Project is intended to alleviate additional traffic to the surrounding area due to planned development; therefore, establishment of additional facilities to maintain acceptable service ratios for the public would not be necessary. The Proposed Project would construct a new roadway network where there currently is none and would be expected to improve emergency response times.

Schools, Parks, and other Facilities

The Proposed Project would not induce population growth and does not include any components that would result in an increase in demand for schools, parks, or other public services, as discussed above. Establishment of additional facilities to maintain acceptable service ratios for the public would not be necessary. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.16 Recreation

4.16.1 Environmental Setting

See section 4.15.1-Parks above for discussion of setting.

4.16.2 Recreation (XV.) Environmental Checklist and Discussion

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?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

The Proposed Project does not include residential or commercial components that would increase human presence in the area which could result in increased use of existing parks or recreational facilities. Therefore, no impact would occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
	☐	☐	☐	☒

Discussion:

Please refer to issue a) above. The Proposed Project does not include recreational facilities or require the construction or expansion of existing recreational facilities. No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.17 Transportation/Traffic

A Traffic Assessment was prepared by KD Anderson (Appendix F) and used in the following analysis.

4.17.1 Regulatory Setting

Madera County General Plan – Adopted October 24, 1995

The Madera County General Plan contains policies that regulate traffic and transportation in the project area.[1] The following Madera County General Plan goals, objectives, and policies for traffic and transportation are relevant to the proposed project:

> Policy 2.A.2: Existing and new streets and roads shall be dedicated, widened, and constructed according to the roadway design and access standards generally defined in the General Plan. Exceptions to these standards may be necessary but should be kept to a minimum. Exceptions shall be permitted only upon determination by the County Road Commissioner that safe and adequate public access and circulation are preserved where such exceptions are permitted.
>
> Policy 2.A.3: Continue to develop and implement the latest technology in road construction.
>
> Policy 2.A.5: Minimize the adverse impacts of road construction and vehicular traffic on the environment and adjacent land uses. Appropriate erosion control measure shall be included in driveway and roadway design. These measures shall be subject to approval by the County Engineering Department.
>
> Policy 2.A.6: Plans for road improvements shall give maximum consideration to the preservation of existing landscaping to the extent that it will be consistent with road system safety.
>
> Policy 2.A.8: Maintain a minimum LOS D for all state and County roadways and intersections.
>
> Policy 2.A.16: Pursue all appropriate federal, state, and local funding sources for street and highway improvements.
>
> Policy 2.A.18: Strive to secure financing in a timely manner for all components of the transportation system to achieve and maintain adopted level of service standards.

---

[1] County of Madera. *Road 600 Over Madera Canal Bridge Project Final Initial Study & Mitigated Negative Declaration.* February 2014

> Policy 2.B.2: Consider the need for future transit right-of-way in reviewing and approving plans for development and roads and highways. Planning for new growth areas should incorporate features to encourage transit and should reserve rights-of-way for future transit access.

4.17.2 Environmental Setting

The Proposed Project is located within the Rio Mesa Area Plan (RMAP) planning area. The RMAP encompasses approximately 15,000 acres and three separate developments: North Fork Village, Rio Mesa Village, and the Avenue 12 Village. The RMAP planning area is bounded by SR 41 to the west, Road 145 to the north, the San Joaquin River and Freson County to the east, Road 145 and the Millerton Lake State Recreational area to the north and northeast, and the San Joaquin River to the south.

The Rio Mesa Village Development consists of the 1,585-acre Tesoro Viejo project, as well as the adjacent Morgan and Jamison parcels. Rio Mesa Blvd is part of the circulation system for the development approved by Madera County for the portion of the Rio Mesa area generally north of the San Joaquin River and east of State Route 41. The Proposed Project will affect intersections along the SR 41 corridor from Avenue 12 to Avenue 15.

Circulation System

The SR 41 / Avenue 15 intersection is a “tee” controlled by a stop sign on the eastbound Avenue 15 approach. There is a long northbound left turn lane, and the eastbound Avenue 15 approach has a short right turn lane to accommodate the turning requirements of trucks. The Tesoro Viejo project is conditioned to install a traffic signal at this location when Tesoro Viejo Road is constructed east of SR 41, and this analysis assumes this improvement will be in place when Rio Mesa Blvd is completed. Proposed intersection improvements to be completed as part of the proposed project include auxiliary turn lanes, including dual southbound and westbound left turn lanes, and additional through lane in each direction on SR 41.

The SR 41 / County Road 204 intersection lies about 0.5 mile south of Avenue 15. This intersection is controlled by stop signs on the County Road 204 approaches. Separate left turn lanes are provided in each direction on SR 41. Ultimately this location will be limited to “right turns only” but under the opening day conditions assessed herein the intersection is assumed to continue to permit full access.

The SR 41 / Avenue 12 intersection is controlled by an actuated traffic signal. The intersection was recently modified. SR 41 has been widened to provide dual northbound left turn lanes, a single northbound through lane and a long northbound right turn lane. Southbound SR 41 has two through lanes. Each Avenue 12 approach has two entry lanes configured as a combined left+through lane and a separate right turn lane.

Existing Traffic Volumes/Roadway Levels of Service

Current traffic volume data was collected at study area intersections in September 2017.[2] Roadway Segment Level of Service. The observed peak hour volumes are the basis for roadway segment LOS calculations based on the methodologies contained in the 2010 Highway Capacity Manual (HCM). The peak hour volumes and LOS results are presented in Table 4.17-1.

Table 4.17-1 Existing Roadway Segment Levels of Service

Street	Location	Direction	AM Peak Hour		PM Peak Hour	
			Volume (vph)*	LOS	Volume (vph)	LOS
SR 41	North of Avenue 12 to Road 204 (2 lanes)	NB	434	D	1,045	E
		SB	1,073	E	600	D
	Road 204 to Avenue 15 (2 lanes)	NB	395	D	994	E
		SB	999	E	535	D
Avenue 12	East of SR 41 (2 lanes)	EB	28	A	20	A
		WB	5	A	44	A

Source: KDA Traffic Impact Study 2017

4.17.3 Transportation/Traffic (XVII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐

---

[2] KD Anderson and Associates, Inc. *Traffic Impact Analysis for the Rio Mesa Blvd Phase 1 Project Madera County, CA.* September 28, 2017.

Discussion:

The Proposed Project would construct a new north-south roadway consistent with a secondary arterial (4-lane undivided). The proposed roadway would include: two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks between Avenue 12 and Avenue 14 (the southernmost portion of the Tesoro Viejo Development). The project would be constructed in two phases and will take approximately eight years for complete build-out. Phase 1 of construction is expected to start in spring 2020 and take approximately five months to complete. Phase 1 will consist of two 12-foot travel lanes, four-foot shoulders, domestic water pipeline, recycled water pipeline, sanitary sewer pipeline, sanitary sewer force main, and roadway drainage facilities. Phase 2 will widen the roadway to four lanes and occur as properties develop within the Rio Mesa Plan area.

The Proposed Project is part of the Rio Mesa Area Plan (Circulation Concept Plan) which has been planned and approved since 1995. The project has been designed to accommodate planned development as well as provide congestion relief for those areas already under construction.

Rio Mesa Blvd is part of the circulation system for the development approved by Madera County for the portion of the Rio Mesa area generally north of the San Joaquin River and east of State Route 41. The alignment of the road has been selected and adopted by Madera County as an Official Plan Line. In conjunction with other planned improvements to SR 41 and new roads to be constructed as development proceeds, Rio Mesa Blvd will form an important north-south route parallel to the state highway. As such, the Proposed Project is consistent with, and in fact a key element of applicable plans for the development and operation of the current and planned circulation system of which the project would be a part. The impact relative to Item a, therefore, is considered ***less than significant***.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐

Discussion:

A traffic impact analysis for the Proposed Project was conducted by KD Anderson Associates, Inc. and is included in its entirety as Appendix F of this Initial Study. The results of that analysis are summarized herein and provide the basis for the impact determinations presented in this section of the checklist. As shown below, the traffic study found that the Proposed Project would improve the congestion on local streets caused by Tesoro Viejo development and other existing and planned development. The project would not generate any daily traffic for operations and maintenance. Construction trip traffic would be temporary and limited to a five-month period for each phase. The project itself would not generate significant new traffic and, as described below, would ultimately improve projected congestion on local roadways and intersections.

As described in detail in Appendix F, trip generation associated with initial Tesoro Viejo development was estimated and assigned to the study area street system based on current regional distribution patterns occurring at study intersections and the general least time path along alternative routes once Rio Mesa Blvd is constructed. Table 4.17-2 presents the trip generation estimate for the initial phases of Tesoro Viejo under Year 2020 conditions.

Table 4.17-2. Initial Tesoro Viejo Development Trip Generation Estimate

Land Use	Quantity	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single Family Residential	1	9.52	25%	75%	0.75	63%	37%	1.00
	600	5,712	113	338	450	378	222	600

Source: KDA Traffic Impact Study 2017

The directional distribution of Tesoro Viejo trips will be expected to follow current travel patterns and be primarily directed to the south. Table 4.17-3 presents the assumptions made for this analysis.

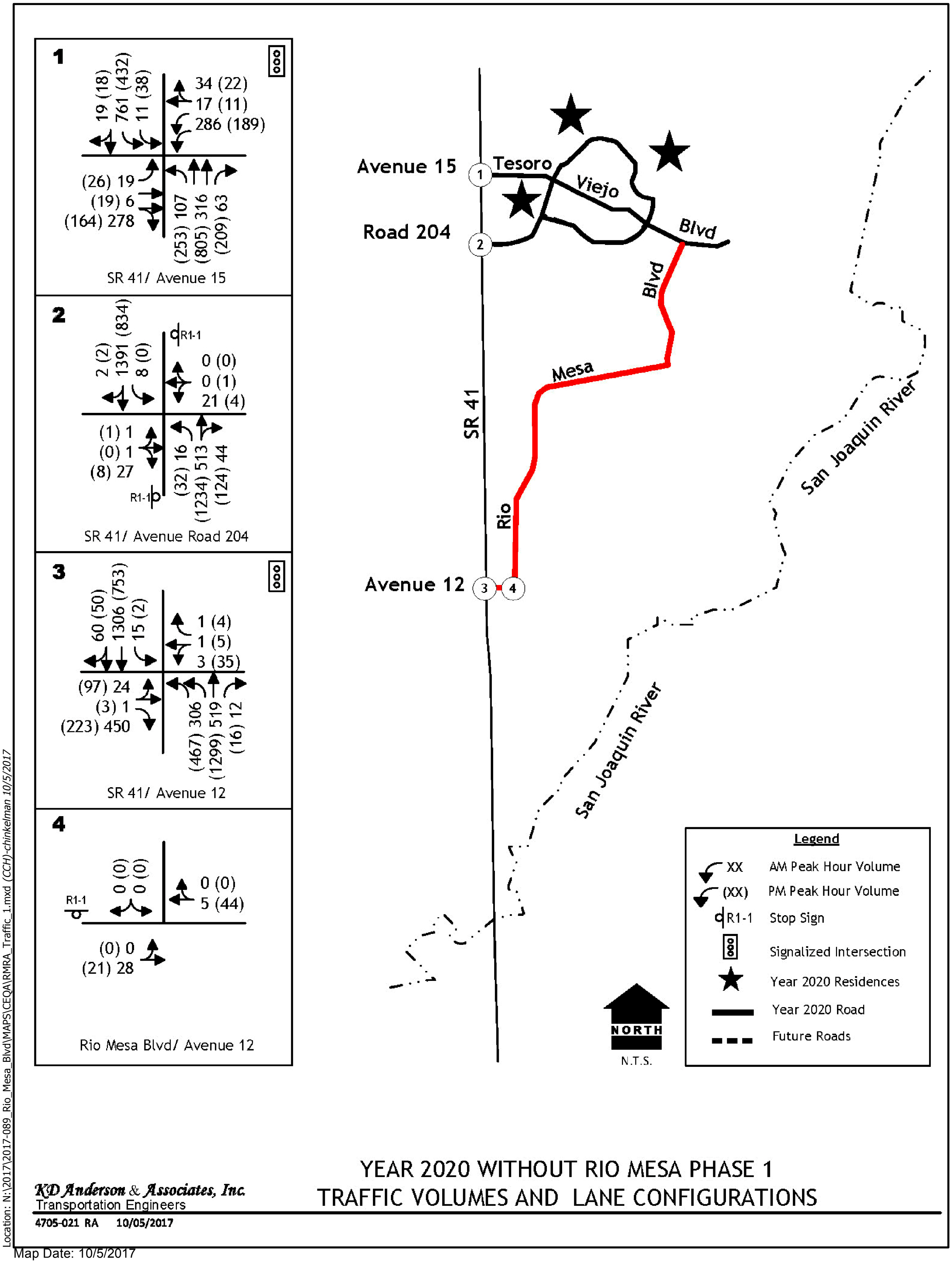
Table 4.17-3. Initial Tesoro Viejo Development Trip Distribution Assumptions

Direction	Route	Percentage of Total Trips
North	SR 41 beyond Avenue 15	10%
West	Avenue 15 beyond SR 41	5%
	Avenue 12 beyond SR 41	5%
South	SR 41 beyond Avenue 12	80%

Source: KDA Traffic Impact Study 2017

The assignment of Tesoro Viejo traffic will reflect the locations of the initial residences relative to overall circulation system, the quality of access to SR 41 from the east and the relative difference in travel time along Rio Mesa Blvd and SR 41. In that regard Tesoro Viejo is conditioned to install a traffic signal at the SR 41 / Avenue 15 intersection when conditions warrant, and the assignment assumes this improvement is made. The travel speed on Rio Mesa Blvd Phase 1 is roughly 40 mph, while the speed on SR 41 und unconstrained conditions is in the range of 55-60 mph. However, congestion at signalized intersections will reduce the overall speed on the state highway. Based on these considerations we have assumed that inbound traffic from the south will be split between Avenue 12-Rio Mesa Blvd (55%), County Road 204 (10%) and Tesoro Viejo Blvd (35%). Conversely outbound traffic headed south will be split between Tesoro Viejo Blvd (65%) and Avenue 12-Rio Mesa Blvd (35%).

THIS PAGE INTENTIONALLY LEFT BLANK



Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\CEQA\RMRA_Traffic_1.mxd (CCH)-chinkelman 10/5/2017

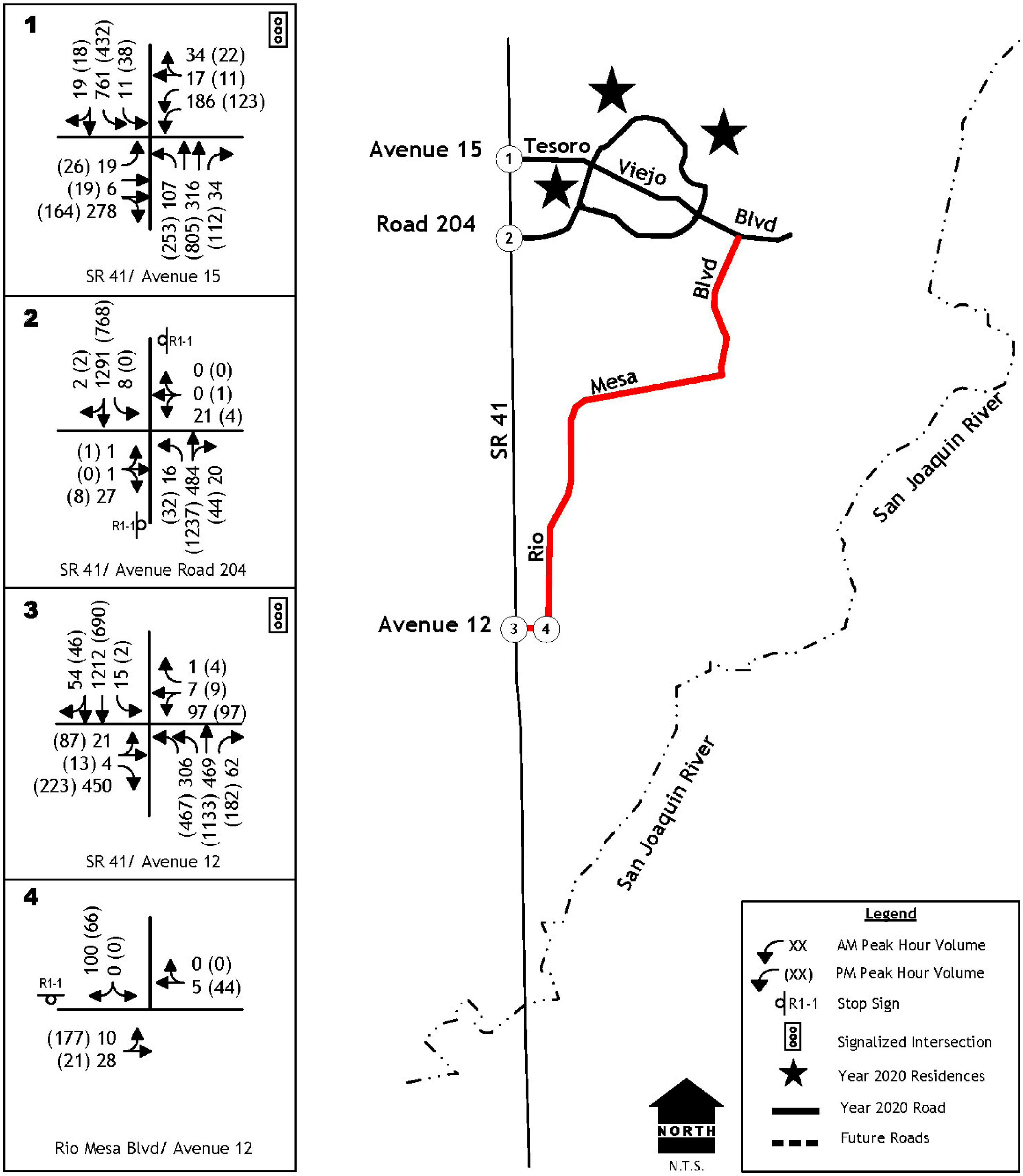
Map Date: 10/5/2017
Source: KD Anderson & Associates, Inc. 10/05/2017

Figure 8. Year 2020 Without Project Phase 1 Traffic Volumes and Lane Configurations

2017-089 Rio Mesa Boulevard Road Alignment

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

THIS PAGE INTENTIONALLY LEFT BLANK



YEAR 2020 WITH RIO MESA BUILDING PHASE 1
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers
4705-021 RA 10/05/2017

Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\CEQA\RMRA_Traffic_2.mxd (CCH)-chinkelman 10/5/2017

Map Date: 10/5/2017
Source: KD Anderson & Associates, Inc. 10/05/2017

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 9. Year 2020 With Project Phase 1 Traffic Volumes and Lane Configurations

2017-089 Rio Mesa Boulevard Road Alignment

THIS PAGE INTENTIONALLY LEFT BLANK

Traffic Volumes / Level of Service. Year 2020 a.m. and p.m. peak hour traffic volumes under these conditions without and with Rio Mesa Blvd Phase 1 are presented in Figures 8 and 9. (Figures 8. Year 2020 Without Project Phase 1 traffic Volumes and Lane Configurations and 9. Year 2020 With Project Phase 1 traffic Volumes and Lane Configurations)

Intersection Levels of Service. The quality of Year 2020 traffic flow conditions has been determined and described in terms of operating Level of Service. Intersection Levels of Service were calculated using the methodologies contained in the 2010 Highway Capacity Manual (HCM), and the results are noted in Table 4.17-4.

Table 4.17-4. Year 2020 Intersection Level of Service

Intersection	Control	AM Peak Hour				PM Peak Hour			
		No Project		With Rio Mesa Blvd Phase 1		No Project		With Rio Mesa Blvd Phase 1	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
SR 41 / Avenue 15	Signal	72.2	E	54.5	D	26.0	C	23.7	C
SR 41 / Co Road 204	EB/WB Stop								
Eastbound Approach		46.9	E	38.6	E	32.7	D	26.9	D
Westbound Approach		364.7	F	237.0	F	200.3	F	131.4	F
SR 41 / Avenue 12	Signal	48.7	D	58.6	E	76.6	E	52.7	D

Source: KDA Traffic Impact Study 2017

The Rio Mesa Blvd Phase 1 project has a positive effect on traffic conditions during the p.m. peak hour, as northbound traffic that would otherwise be in the single northbound travel lane can be diverted to Avenue 12. This reduces the average delay at that time. The change in travel patterns created by the Rio Mesa Blvd extension does not create the need to modify the intersection as recent reconstruction has provided a very long northbound right turn lane that can accommodate the diverted traffic.

Level of Service on Roadway Segments. Year 2020 roadway segment Levels of Service are noted in Table 4.17-5. Overall, conditions on the two-lane segments of SR 41 will continue to exceed the LOS D standard for the area. However, Rio Mesa Blvd Phase 1 will allow some traffic to be diverted from SR 41 which will have a positive impact on travel on the highway.

Table 4.17-5. Year 2020 Roadway Segment Levels of Service

Street	Location	Direction	AM Peak Hour				PM Peak Hour			
			No Project		With Rio Mesa Blvd Phase 1		No Project		With Rio Mesa Blvd Phase 1	
			Volume (vph)	LOS	Volume (vph)	LOS	Volume (vph)	LOS	Volume (vph)	LOS
SR 41	North of Avenue 12 to Road 204 (2 lanes)	NB	544	D	491	D	1,400	E	1,224	E
		SB	1,381	E	1,281	E	805	E	738	D
	Road 204 to Avenue 15 (2 lanes)	NB	486	D	457	D	1,267	E	1,170	E
		SB	1,325	E	1,225	E	795	E	719	D
Avenue 12	East of SR 41 (2 lanes)	EB	28	A	81	B	21	A	197	B
		WB	5	A	105	B	44	B	110	B

As stated above in (a), Rio Mesa Blvd is an important element in the area circulation system and has been included in the long-term planning for the Rio Mesa area of Madera County for some time. The project has been reflected in environmental documents prepared for development proposals on both sides of SR 41. The Project would not generate any daily traffic for operations and maintenance. Construction trip traffic would be temporary and limited to a five-month period for each phase. As the Project would not generate significant new traffic, or adversely affect existing and projected levels of service, the impact to the level of service on surrounding roadways due to Project implementation would be ***less than significant***.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒

Discussion:

Arnold Ranch Airport is the closest airport in the proximity to the Proposed Project, located approximately 0.75 miles south of the Project Site. The Propose Project will construct a new roadway that will have connections to SR 41 and will not propose any structures that would impede a height limitation in close proximity to an airport. Therefore, project will have ***no impact***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒

Discussion:

The Proposed Project will be designed to avoid hazardous design features and will comply with the Caltrans Local Roadway Safety Manual guidance. The Proposed Project will not bisect farmland in a way that would leave sections of property that require the farmer to cross the road with farm equipment to access the parcel remnant. Therefore, project will have ***no impact***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Would the project result in inadequate emergency access?	☐	☐	☐	☒

Discussion:

Once operational the Proposed Project will improve traffic operations on local roadways and SR 41, which could potentially reduce delays for emergency vehicles. The proposed project will construct a new roadway where one does not currently exist and will not require full or partial closures or detours during construction activities or operation. Therefore, project will have ***no impact***.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f) Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

Discussion:

For reasons discussed in Sections 4.17.3 a and b, above, the project in general, and project design specifically is consistent with existing transportation plans and applicable design guidelines relative to public transit, bicycle and pedestrian facilities. Therefore, the impact of the project for Item f is considered ***less than significant***.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.18 Tribal Cultural Resources

This section describes the affected environment and regulatory setting for Tribal Cultural Resources (TCRs) in the project area. The following analysis of the potential environmental impacts related to TCRs is derived primarily from the following sources and agencies:

- California Native American Heritage Commission Sacred Lands File Search, July 20, 2017
- Cultural Resource Inventory and Evaluation Report for Rio Mesa Boulevard, Madera County, California, October 2017
- Ethnographic overview of the Northern Valley Yokuts by William J. Wallace (1978)

4.18.1 Environmental Setting

Ethnographic, Religious, and Cultural Context

The project area can be associated with territory occupied by the Penutian-speaking Northern Valley Yokuts. Their territory extended from above the junction of the San Joaquin, Old, and Mokelumne rivers on the north, to the big westward bend in the San Joaquin River in the south. Unfortunately, the ethnography of the northern, or lower, San Joaquin Valley is poorly known, due to the fact that the native inhabitants were for the most part gone by the time studies were undertaken. Disease, flight from missionization, and conflicts with the miners and settlers who suddenly entered the area in large numbers reduced the native population to small, isolated remnants. Thus, the available information has been gleaned from historic accounts of early explorers, soldiers, hunters and trappers, and missionaries. Archaeology has added some information, but the record is by no means complete (Wallace 1978).

The Yokuts, (meaning “person” or “people”) who were Penutian/Yokutsan speakers, were divided into three distinct groups: the Northern Valley Yokuts, the Southern Valley Yokuts, and the Foothills Yokuts. These groups spoke different dialects, and were separated by topography (Kroeber 1976; Shipley 1978). Controversy surrounds the date for Yokuts presence in the northern part of the San Joaquin Valley. Linguistic studies suggest that the Northern Valley Yokuts were relatively recent arrivals, moving from the south about 500 years ago, as a result of pressure from Numic speakers moving into the San Joaquin drainage from the west. However, Moratto (1984) suggests that a Yokuts presence in the Stockton area can be discerned in the archaeological record before AD 400. A drier climate in the lower foothills and valley edges may have triggered occupation of the riverbanks in the Central Valley at that time. In any case, by the time the Spanish arrived in the early part of the nineteenth century, the Northern Valley Yokuts were well entrenched, with established settlements on low mounds in the Delta and along the banks of the San Joaquin River and its tributaries. Population estimates for the entire San Joaquin Valley range from 11,000 to over 52,000, but these are only estimates, and the true population is not known (Moratto 1984; Wallace 1978).

Village settlements were composed of small round-to-oval house structures, closely spaced in a row along a riverbank. Houses were covered with light, woven tule reed mats. Villages were located mostly along the eastern bank of the San Joaquin River and along its tributaries. Sweathouses and ceremonial chambers were also found in these villages (Wallace 1978). Kroeber (1976) suggests that territories of the tribes within the Yokuts group averaged about 300 square miles, which he suggests is about a half-day's walk in each direction. Though no records exist, it is likely that social organization was centered on the family. It has been suggested that the Southern Valley Yokuts were divided into two moieties based on patrilineal descent, and this may have been true for those in the north (Wallace 1978). However, marriage was matrilocal, with the groom moving in with the bride's family. Polygamy was also practiced, with wives located in several villages, thus creating ties and alliances between dispersed groups (Kroeber 1976).

Not surprisingly, given their proximity to rivers and the Delta, a large part of Northern Valley Yokuts subsistence was based on fishing. King salmon, which spawned in the San Joaquin River and its tributaries, were an important resource, but the Yokuts made use of other native species such as white sturgeon, river perch, western suckers, and Sacramento pike as well. Dragnets with stone sinkers were used, as were harpoons with bone or antler tips (Wallace 1978).

In addition, the enormous populations of waterfowl present in the Valley were exploited, as were the large herds of tule elk and pronghorn antelope. It is thought, however, that hunting was a marginal resource procurement activity when compared to fishing. Gathering of plant resources, though, was as important as fishing, with acorns from the stands of huge valley oaks being a major component of this activity. Tule roots and a variety of seeds also were utilized (Wallace 1978).

Like their Nisenan neighbors to the north, the Northern Valley Yokuts were politically organized into tribelets, estimated to be of about 300 people each. Tribelets known to be in the Delta area were the Chulamni, the Cholbones, the Coybos, and the Nototemnes. A tribelet identified as the Chowchilla reportedly lived along the Chowchilla River near the Project Area (Wallace 1978). Generally sedentary, the Northern Valley Yokuts would disperse seasonally for hunting and gathering expeditions and were sometimes forced out by flooding (Wallace 1978). Chiefs gained their position through wealth, and since women were occasionally chiefs, inheritance appears to have been important (Kroeber 1976).

The Spanish arrived on the coast in 1769 and by 1776 the central valley had been explored by José Canizares. In 1808, the area was crossed by Gabriel Moraga, and in 1813, a major battle was fought between the Miwok to the north and the Spaniards near the mouth of the Cosumnes River. Though the Yokuts appear to have escaped being removed to missions by the Spanish, they were not spared the ravages of European-spread disease. In 1833, an epidemic – probably malaria – raged through the Sacramento and San Joaquin valleys, killing an estimated 75 percent of the native population. Not far to the north, when John Sutter erected his fort at the future site of Sacramento, he had no problem getting the few neighboring Nisenan survivors to settle nearby. The discovery of gold in 1848, near the Nisenan village of Colluma (also Coloma), drew thousands of miners into the area, and led to widespread killing and the near total destruction of traditional Nisenan and Yokuts cultures (Wilson and Towne 1978). By the latter part of the 1800s, the Yokuts had virtually ceased to exist (Kroeber 1976; Wallace 1978).

4.18.2 Regulatory Setting

Assembly Bill 52 (AB 52)

Effective July 1, 2015, Assembly Bill 52 (AB 52) amended CEQA to require that: 1) a lead agency provide notice to those California Native American tribes that requested notice of projects proposed by the lead agency; and 2) for any tribe that responded to the notice within 30 days of receipt with a request for consultation, the lead agency must consult with the tribe. Topics that may be addressed during consultation include TCRs, the potential significance of project impacts, type of environmental document that should be prepared, and possible mitigation measures and project alternatives.

Pursuant to AB 52, Section 21073 of the Public Resources Code defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of the Statutes of 2004." This includes both federally and non-federally recognized tribes.

Section 21074(a) of the Public Resource Code defines TCRs for the purpose of CEQA as:

1) Sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    a. included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or
    b. included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or
    c. 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Because criteria a and b also meet the definition of a Historical Resource under CEQA, a TCR may also require additional consideration as a Historical Resource. TCRs may or may not exhibit archaeological, cultural, or physical indicators.

Recognizing that California tribes are experts in their tribal cultural resources and heritage, AB 52 requires that CEQA lead agencies provide tribes that requested notification an opportunity to consult at the commencement of the CEQA process to identify TCRs. Furthermore, because a significant effect on a TCR is considered a significant impact on the environment under CEQA, consultation is used to develop appropriate avoidance, impact minimization, and mitigation measures.

Summary of Consultation

AB 52 consultation requirements went into effect on July 1, 2015 for all projects that have not already published a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration, or published a Notice of Preparation of an EIR (Section 11 [c]). As described above in Section 4.18.1 Environmental Setting, stipulated in Public Resources Code Section 21080.3.1(b), the lead agency shall begin consultation only when a California Native American tribe requested to the lead agency, in writing, to be informed through formal notification of Proposed Projects and when the tribe, after being noticed, responds within 30 days to indicate its desire to consult on the specific project.

One California Native American tribe has requested in writing to be informed of proposed County of Madera projects under AB 52. On August 29, 2017 the County received a general request letter from the Dumna Wo-Wah Tribal Government, requesting to be informed of any proposed projects under Madera County's jurisdiction. On September 28, 2017 the County mailed the Dumna Wo-Wah Tribal Government a letter to offer consultation under AB 52.

In accordance with Section 21080.3.1(d) of the PRC, The County of Madera requested a response from the tribes to an opportunity to consult before October 28, 2017. Prior to the outset of the September 28, 2017 letter the county had already established with Dumna Wo-Wah would be seeking consultation under AB52. Because AB 52 requires that consultation, if requested, be initiated within 30 days of the County's receipt of the request, the consultation was formally initiated at a meeting held at Madera County offices on October 6th, 2017. On October 6, 2017 the County met with the Dumna Wo-Wah tribe to discuss the proposed project. Topics discussed during this consultation meeting included, but were not limited to: general concerns about the potential presence of TCRs within the project area and potential mitigation measures. On October 9, 2017 the Dumna Wo-Wah tribe received a copy of the *Cultural Resources Inventory and Evaluation Report-Rio Mesa Boulevard,* prepared by ECORP Consulting Inc. dated October 2017 for their review. The Dumna Wo-Wah subsequently provided confidential information to the County regarding the location of known TCRs. This information was reviewed by the County and used to inform the content of this IS/MND; however, in accordance with Section 21082.3(c)(1) of the Public Resources Code, "... information, including, but not limited to, the location, description, and use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with subdivision (r) of Section 6254 of, and Section 6254.10 of, the Government Code, and subdivision (d) of Section 15120 of Title 14 of the California Code of Regulations, without the prior consent of the tribe that provided the information." Therefore, the specific information about the tribal cultural resource is not included in this IS/MND, and remains within a confidential administrative record and not available for public disclosure under any circumstance.

On October 18, 2017 the County and the Dumna Wo-Wah tribe came to an agreement on mitigation requests put forth by the tribe which have been incorporated into this IS/MND and consultation was closed.

TRIBAL CULTURAL RESOURCES

In addition to consultation with the Dumna Wo-Wah tribe, information about potential impacts to additional TCRs was drawn from: 1) the results of a Sacred Lands File of the NAHC; 2) results of a Cultural Resources Inventory and Evaluation Technical Study (Cunningham 2017) which includes results of a California State Historic Information System (CHRIS) Records Search and 3) existing ethnographic information about prehistoric lifeways and settlement patterns.

Sacred Lands File Search

A search of the Sacred Lands File was requested by ECORP on July 20, 2017 and was performed by the NAHC on July 31, 2017. This was completed to inform the Cultural Resources Inventory and Evaluation Report. The NAHC responded to report that its search of the sacred lands file had indicated the presence of Native American cultural resources in the immediate project area, and suggested contacting the Dumna Wo-Wah Tribal Government for more information.

Cultural Resources Technical Study and CHRIS Records Search

ECORP prepared a Cultural Resources technical study for this project (Cunningham 2017), which included a CHRIS Records Search, Literature review, a pedestrian survey. The CHRIS records search was performed at the Southern San Joaquin Valley Information Center on July 19, 2017. The results of the search indicated one prehistoric cultural resource, a bedrock milling site, was previously recorded approximately 0.2 mile east of the project area. A field survey of the project area did not identify any prehistoric cultural resources within the Project Area.

Ethnographic Information

The ethnographic information reviewed for the project, including ethnographic maps, does not identify any villages, occupational areas, or resource procurement locations in or around the current project area (Wallace 1978). The nearest Native American cultural site is a village called Holowichniu, located approximately five miles northeast of the Project Area near Millerton Lake. The San Joaquin River is located 1.3 miles southeast of the Project Area at its nearest location, and Root Creek is located 0.2 mile southeast of the project area at its nearest location.

Soils within the project area consist mainly of clay and sandy loams that are considered hydric or have hydric components (NRCS 2017a). Sediments within the Project Area consist primarily of Pleistocene nonmarine sediments (Qc) with Tertiary nonmarine sediments (Tc) in the western portion of the Project Area (Matthews and Burnett 1965). Human occupation occurred near the end of the Pleistocene, suggesting these deposits most likely predate human occupation. However, given the likelihood of prehistoric archaeological sites located along perennial waterways, coupled with nearness of the Project Area to the San Joaquin River, there exists the potential for buried prehistoric archaeological sites in the Project Area. Any evidence of prehistoric land use in the project area would have been visible on the surface of the ground, and able to be observed by professional archaeologists during surveys of the project area. This means that the likelihood for village sites in or near the project area is relatively low.

Conclusions

The search of the Sacred Lands File by the NAHC identified TCRs or sacred lands within or immediately adjacent to the project area. As of the time of this IS MND, no comments or requests for consultation under AB52 have been received. Due to the identification of Sacred Lands by the NAHC's search of the Sacred Lands File, coupled with the proximity of the Project Area to perennial waterways, suggests that there is a high or moderate potential for TCRs inside the project area.

Significance Criteria

AB 52 established that a substantial adverse change to a TCR has a significant effect on the environment. In assessing substantial adverse change, the County must determine whether or not the project will adversely affect the qualities of the resource that convey its significance. The qualities are expressed through integrity. Integrity of a resource is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [CCR Title 14, Section 4852(c)]. Impacts are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, Section 15064.5(a)]. Accordingly, impacts to a TCR would likely be significant if the project negatively affects the qualities of integrity that made it significant in the first place. In making this determination, the County need only address the aspects of integrity that are important to the TCR's significance.

4.18.2 Tribal Cultural Resources (XVIII.) Environmental Checklist and Discussion

a) 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:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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.	☐	☒	☐	☐

Discussion a and b:

Based on a records search of the Sacred Lands File of the NAHC, which were obtained by ECORP Consulting on July 31, 2017 and consultation with the Dumna Wo-Wah Tribal Government, ground disturbing activities could result in the unanticipated discovery of prehistoric archaeological sites, which may be considered to be tribal cultural resources. Impacts to unknown TCRs that may be discovered during project construction would be less than significant with the incorporation of Mitigation Measure MM TCR-1 and TRC-2.

Mitigation Measures

TCR-1: The project applicant shall retain the Dumna Wo-Wah Tribal Government or other applicable cultural resource specialists to observe and monitor all earth-moving, grading, boring, and sub-surface activities. Prior to issuance of a grading permit, evidence shall be provided for placement in the Project file that a Native American monitor has been retained. In the event that subsurface archaeological resources/human remains are encountered during the course of grading and/or excavation, all development shall temporarily cease in these areas until the archaeological resources are properly assessed and subsequent recommendations are determined by a qualified archaeologist. In the event that human remains are discovered, there shall be no disposition of such human remains, other than in accordance with the procedures and requirements set forth in California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. These code provisions require notification of the County Coroner and the Native American Heritage Commission, who in turn must notify those persons believed to be most likely descended from the deceased Native American for appropriate disposition of the remains. Excavation or disturbance may continue in other areas of the Project Site that are not reasonably suspected to overlie adjacent remains or archaeological resources. Copies of a subsequent archaeological study or report, detailing the nature of any archaeological discovery, remedial actions taken, and disposition of any accessioned remains shall be submitted to the Southern San Joaquin Valley Information Center at CSU Bakersfield.

TCR-2: ECORP will conduct one pre-construction meeting for construction personnel on the first day of construction, or within one week prior to the start of ground-disturbing activities, to review the potential for encountering archeological resources in the Project area, notification procedures if archaeological material is discovered, and coordination between construction personnel and agency staff.

4.19 Utilities and Service Systems

4.18.1 Environmental Setting

Water Service

Surface Water in Madera County is managed by irrigation districts, while the management of groundwater wells for municipal use is administered by local governments. There are four irrigation districts that operate within Madera County: the Madera Irrigation District (MID), Chowchilla Water District (CWD), Gravely Ford Water District, and Clayton Water District. Areas to the north of the project site are serviced by the Madera Irrigation District. Water service for the Rio Mesa Planning area was established under County Service Area #22 (Table Mountain) on July 22, 2008. Water Service for the project area is provided by MID.

Wastewater

The project site is majority undeveloped land; consequently there are no existing wastewater facilities or conveyance structures onsite.

Solid Waste

Solid waste disposal services for Madera County are provided by two franchise haulers: EMADCO, which serves eastern Madera County, and Madera Disposal, which serves the valley area. Waste collected by these two haulers and waste generated in the unincorporated areas of the County are disposed of at Fairmead landfill, a 48-acre county owned disposal facility operated by Madera Disposal Systems, Inc.

Electrical, and Natural Gas Service

Electrical and natural gas services to customers in the County limits are provided by the Pacific Gas and Electric Company (PG&E).

4.19.2 Utilities and Service Systems (XIX.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒

Discussion:

The Proposed Project will construct a new roadway across undeveloped land and would not create wastewater nor will it require utility services as a part of construction or operations; therefore, there will be no impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
b)	Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Please see discussion in item (a) above. No impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐

Discussion:

As a result of the project, there would be a less than significant effect in the pre- to post-development runoff or peak flow rates. In general, drainage inlets will be constructed at approximately 800-foot intervals along the road alignment. The drainage conveyance facilities will convey the water to the existing drainage tributaries. Prior to discharge, the drainage will be treated for water quality in accordance with the Tesoro Viejo Water Quality Manual and the applicable MS4 permit requirements. As individual properties develop within the plan area, they will be required to provide site drainage features to ensure no net increase in runoff along with water quality measures as noted. Therefore, no mitigation is required.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
d)	Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

Please see discussion in item (a) above. No impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e)	Would the project 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?	☐	☐	☐	☒

Please see discussion in item (a) above. No impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
f)	Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐

Discussion:

The Proposed Project would not generate on-going solid waste. Any construction related waste generated by the Proposed Project would be disposed of at Fairmead Landfill. It is anticipated that Fairmead Landfill will reach capacity in 2020. However, waste diversion tactics such as recycling could increase capacity life. The minimal increase in waste is not expected to effect the permitted capacity of the landfill. A less than significant impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
g)	Would the project comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion:

Waste generated by the Project would comply with all applicable federal, state, and local statutes and regulation related to solid waste (refer to the response to section 4.19.2 f) above). No impact would occur.

Mitigation Measures

No significant impacts were identified, and no mitigation measures are required.

4.20 Mandatory Findings of Significance

4.20.1 Mandatory Findings of Significance (XVIII.) Environmental Checklist and Discussion

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☒	☐	☐

The proposed Project has the potential to adversely affect: Air Quality, Biological Resources, and Cultural Resources. Proposed mitigation measures include: controlling fugitive dust emissions; avoiding biologically sensitive areas; protecting water quality with suitable erosion control measures; protecting cultural resources as needed; implementing measures for safe transport of hazardous materials; and implementing measures to ensure traffic safety. With the adoption and implementation of the proposed mitigation measures, resource impacts would be reduced to less than significant levels.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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)?	☐	☐	☒	☐

Rio Mesa Blvd is an important element in the area circulation system and has been included in the long term planning for the Rio Mesa area of Madera County for some time. The project has been reflected in environmental documents prepared for development proposals on both sides of SR 41. The volume of traffic using Rio Mesa Blvd will vary over the year as development occurs. The volume occurring at any individual location along the roadway will vary based on where development occurs. For example, the current version of the Madera County Transportation Commission (MCTC) travel demand forecasting model anticipates future development concentrated south of Avenue 12 and near the SR 41 / Avenue 15 intersection. As a result, model forecasts for Rio Mesa Blvd in the study area are roughly 2,000 ADT in the Year 2035. This volume can be accommodated by the Phase 1 roadways or Phase 2 improvements.

Other documents suggest a greater level of development and higher traffic volumes. The traffic impact analysis for the Austin Quarry Project EIR included traffic model plots that reflected greater Rio Mesa area development and the extension of the roadway to Children's Blvd. The daily traffic volume forecast for Rio Mesa Blvd north of Avenue 12 was 13,000 vehicles per day. Appendix materials for the Tesoro Viejo project EIR indicated that these volumes can be accommodated by the Phase 2 improvements. Without Rio Mesa Blvd that volume would be spread to other roadways and overall traffic flow conditions would be worse. Additionally, All Project level impact have been determined to be less than significant or less than significant with mitigation incorporated. Therefore, the Project would not contribute to any cumulatively significant effects.

It should be noted that Caltrans District 6 has monitored development in the Rio Mesa area and commented on development projects as they have proceeded. District 6 has considered the adopted alignment of Rio Mesa Blvd and commented on the relative distance along Avenue 12 between the future SR 41 interchange ramps and the Rio Mesa Blvd intersection. Their comments suggested that greater distance might be needed to accommodate queuing between these intersections.

The extent to which construction of Rio Mesa Blvd Phase 1 along the adopted alignment causes a future operational problem is dependent on the nature and location of future development in the area. If the traffic increases at the level anticipated by the MCTC traffic model, then the spacing issue is probably not relevant. If the greater volumes anticipated in the Austin Quarry Project FEIR occur, it may eventually be necessary to relocate the roadway to accommodate the operation of two adjoining signalized intersection. The County of Madera should continue to evaluate this location as future development proposals come forward and confirm whether the intersection needs to be relocated.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

All Project level impacts have been determined to be less than significant or mitigated to a level considered less than significant and none of the impacts would cause substantial adverse effects on people, either directly or indirectly.

SECTION 5. LIST OF PREPARERS

LEAD AGENCY NAME

Madera County

Matthew Treber, Director
Jamie Bax, Senior Planner

ECORP Consulting, Inc.

CEQA Documentation/Biological and Cultural Resources

Chris Stabenfeldt, AICP, Senior Environmental Scientist/Project Manager
Amberly Morgan, Senior Environmental Planner/Project Manager
Rick Hanson, Senior Environmental Analyst
Jerry Aguirre, Assistant Environmental Scientist
Emily Mecke, Associate Biologists/Associate Project Manager
Wendy Blumel, Senior Archaeologists/Assistant Cultural Resources Manager
Seth Myers, Air Quality & Noise Analyst
Brian Fedrow, Production Manager, Technical Editor

Sub Company Name

Transportation/Traffic Analysis

Ken Anderson, P.E., KD Anderson & Associates

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 6. REFFERENCES

Bateman, P.C., Busacca, A.J., Marchand, D.E., and Sawka, W.N.
1982. Geologic map of the Raymond quadrangle, Madera and Mariposa Counties, California: U.S. Geological Survey, Geologic Quadrangle Map GQ-1555, scale 1:62,500

CARB (California Air Resources Board).
2005. California Almanac of Emissions and Air Quality.

CARB (California Air Resources Board).
2016. Ambient Air Quality Standards. Available at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed September 27, 2017.

CDPH (California Department of Public Health).
2007. Valley Fever Fact Sheet. Available at: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx. Accessed September 27, 2017.

Caltrans (California Department of Transportation).
2004. Transportation- and Construction-Induced Vibration Guidance Manual.

DOC (California Department of Conservation).
2000. A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos.

EPA (US Environmental Protection Agency).
1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

[FEMA] Federal Emergency Management Agency
2017. Flood Map Service Center: Seach By Address. Available at https://msc.fema.gov/portal/search?AddressQuery=10878%20CA-41%20Madera%2C%20CA%2093636#searchresultsanchor. Accessed on September 25, 2017

FTA (Federal Transit Administration).
2006. Transit Noise and Vibration Impact Assessment.

KD Anderson & Associates, Inc.
2017. Traffic Impact Analysis for the Rio Mesa Blvd Phase 1 Project.

SJVAPCD (San Joaquin Valley Air Pollution Control District).
2002. Guide for Assessing and Mitigation Air Quality Impacts Technical Document.

SJVAPCD (San Joaquin Valley Air Pollution Control District).
2015. Guidance for Assessing and Mitigating Air Quality Impacts.

[SWRCB] California State Water Resources Control Board
2017. GeoTracker. Available at http://geotracker.waterboards.ca.gov/. Accessed on September 18, 2017.

Matthews, R.A., and Burnett, J.L.
1965. Geologic map of California: Fresno sheet: California Division of Mines and Geology, scale 1:250,000

Marchand, Denis E. and Alan Allwardt
1981. Late Cenozoic Stratigraphic Units Northeastern San Joaquin Valley, California. U.S. Department of the Interior Bulletin 1470, United States Government Printing Office, Washington.

Natural Resources Conservation Service (NRCS)
2017. Official Soil Series Descriptions. Electronic document, https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/class/data/?cid=nrcs142p2_053587. Accessed 2 October 2017.

University of California Museum of Paleontology (UCMP)
2017a. Specimen Search, http://ucmpdb.berkeley.edu/. Accessed 2 October 2017.

U.S. Fish and Wildlife Service (USFWS).

2011. U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance. Prepared by the Sacramento Fish and Wildlife Office. January 2011.

SECTION 7. LIST OF APPENDICES

Appendix A – Emissions Model Outputs, ECORP Consulting, Inc., September 2017

Appendix B – Biological Resources Assessment, ECORP Consulting, Inc. October 2017

Appendix C – Cultural Resources Assessment, ECORP Consulting, Inc., October 2017

Appendix D – Noise Contour Model Outputs, ECORP Consulting, Inc., September 2017

Appendix E – Paleontological Records Search, ECORP Consulting, Inc. October 2017

Appendix F – Traffic Assessment, KD Anderson & Associates, Inc., September 2017

APPENDIX A-3

A3 - Public/Agency Comment Letters

- California Department of Transportation, District 6
- Remy, Moose. & Manley, LLP

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 6
1352 WEST OLIVE AVENUE
P.O. BOX 12616
FRESNO, CA 93778-2616
PHONE (559) 445-5868
FAX (559) 445-5875
TTY 711
www.dot.ca.gov

Making Conservation a California way of life.

November 21, 2017

06-MAD-041-3.232
IS/MND
Rio Mesa Boulevard Project

Ms. Jamie Bax
Senior Planner
County of Madera
200 W. 4th Street
Madera, CA 93637

Dear Ms. Bax:

Thank you for including Caltrans in the environmental review process for the project referenced above. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

Caltrans provides these comments consistent with the State's smart mobility goals that support a vibrant economy, and build communities. The following comments are based on the Draft Initial Study and Mitigated Negative Declaration (MND) for the Rio Mesa Boulevard (Blvd) Project in the County of Madera:

The proposed Rio Mesa Blvd (Phases 1 and 2) located east of State Route (SR) 41 would connect Avenues 12 and 15. Rio Mesa Blvd and Avenue 12 would form a 3-legged intersection, which is located at approximately 1,300 feet from the existing SR 41 for Phases 1 and 2.

The Rio Mesa Blvd and Avenue 12 intersection is proposed to close to the future SR 41 northbound off-ramp to Avenue 12. Rio Mesa Blvd is a planned north-south arterial within the Rio Mesa Area Plan. With the proposed Project, it is anticipated that an increase in traffic volumes from SR 41 to Avenue 12 traversing to Rio Mesa Blvd. Therefore, it is recommended that the proposed Rio Mesa Blvd connection to Avenue 12 be located at a minimum distance of one-half mile from SR 41. Our previous comments dated September 21, 2006 to locate the proposed Rio Mesa Blvd at Avenue 12 to a distance of one-half mile from the existing SR 41 still applies. It should be noted that the Riverstone Project was required to relocate Business 41 to address close intersection spacing to meet operational needs.

The traffic impact study (TIS) analysis for the future buildout scenario was not included in the study. The intersection of Rio Mesa Blvd and Avenue 12 for the buildout traffic scenario is critical. It should include the analysis of the future northbound on/off-ramp at Avenue 12. Page 1 of the TIS in Appendix F stated the report would analyze the future Year 2035 Cumulative with Rio Mesa Blvd. However, the future traffic scenario should be Year 2040. This should also include the future extension of Rio Mesa Blvd to Children's' Blvd. Therefore, the TIS is incomplete and should be revised.

The TIS analyzed a 600-unit subdivision within the Tesoro Viejo development. Rio Mesa Blvd was planned for ultimate buildout within the Rio Mesa Area Plan. The location of Rio Mesa Blvd at Avenue 12 should be designed for the ultimate buildout of the Rio Mesa Area Plan as well as the proposed Community Hospital at the northeast quadrant of the SR 41/Avenue 12 intersection.

On Page 2-1, 2nd paragraph, "The Proposed Project is designed to facilitate regional traffic flow generated by these projects and other traffic generators, thereby relieving pressure on SR 41." All traffic within the Rio Mesa Area Plan that have access to Rio Mesa Blvd would impact SR 41/Avenue 12 intersection and SR 41 mainline south of Avenue 12.

The level-of-service (LOS) information; worksheets; and the existing and the future buildout scenarios for the intersections of Rio Mesa Blvd /Avenue 12 and SR 41/County Road 204 were not included in the TIS. This should be provided to Caltrans for review.

The environmental study did not report the existing and future buildout LOS. Please provide this information to Caltrans for review.

The study stated that the speed on SR 41 is in the range of 50-60 mph. The study should report the current posted speed limits instead of reporting the speed within the range.

On Page 4-97 of the Transportation/Traffic section, Policy 2.A.8, should be changed to LOS "C" for State highway.

On Page 4-98 of the Transportation/Traffic section, Circulation System, the SR 41/Avenue 15 intersection improvement that would be constructed by Tesoro Viejo development is still in the design process. The lane configuration that is reported in this report should be consistent with the intersection improvement plans.

On Page 4-98 of the Transportation/Traffic section, Circulation System, the SR 41/County Road 204 (Avenue 14 ½) intersection improvements that will be constructed by Tesoro Viejo development will not have full access to SR 41. The left-turn out movement from County Road 204 (Avenue 14 ½) will be restricted to right-in/right-out and left-ins.

On Page 4-107, 3rd Paragraph, stated "The change in travel patterns ….does not create the need to modify the intersection …very long northbound right-turn lane that can accommodate the diverted traffic." There is only one existing northbound lane on SR 41 at Avenue 12. The SR 41 northbound right-turn lane at Avenue 12 would most likely be blocked by the northbound through traffic.

If you have any further questions, please contact David Padilla at (559) 444-2493.

Sincerely,

MICHAEL NAVARRO, Chief
Transportation Planning – North

RMM
REMY | MOOSE | MANLEY LLP

Andrea K. Leisy
aleisy@rmmenvirolaw.com

November 20, 2017

Via Overnight and Electronic Mail
Jamie.Bax@madera-county.com

Mr. Jamie Bax, Senior Planner
Madera County
200 West Fourth Street, Suite 3100
Madera, CA 93637

Re: Rio Mesa Boulevard Mitigated Negative Declaration and Initial Study (SCH No. 2017101048)

Dear Mr. Bax:

We submit this comment letter on the above referenced proposed Rio Mesa Boulevard Project and related Mitigated Negative Declaration and Initial Study ("IS/MND" or "Project") on behalf of our clients, the Rio Mesa Property Owners Group, an unincorporated association of landowners within the Rio Mesa area.[1] For the reasons discussed in detail below and in the attached expert comment letters, substantial evidence shows that the proposed Project may result in one or more potentially significant adverse impacts on the environment therefore requiring preparation of an environmental impact report ("EIR") rather than a IS/MND under the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) and CEQA's implementing guidelines prior to project approval. (Cal. Code Regs. tit. 14, 15000 et seq. ("CEQA Guidelines").) [2]

As a global matter, our clients request that the County approach buildout and development of the Rio Mesa area in a more holistic fashion, including through an update or amendment to the previously adopted 1995 Rio Mesa Area Plan ("RMAP"), or via adoption of a new specific plan. Our clients are concerned that the County is piecemealing its approval of development within the Rio Mesa area, as evidenced by past plan line amendments of various roadways (including Rio Mesa) and the proposed

---

[1] It appears ECORP Consulting prepared the IS/MND under a professional services contract which is required to be publically disclosed and approved by the Board of Supervisors. We have been unable to find evidence of the Board's approval from January 1, 2017 thru October 31, 2017. Our clients would like clarification on this issue.

[2] This letter incorporates by reference, as if fully set forth herein, the attached comment letters prepared by Live Oak Associates, Inc. (Attachment A) and Smith Engineering & Management (Attachment B).

Project at issue. This approach conflicts with Policy 1.1 of the RMAP, which holds that "facilities shall be sized consistent with infrastructure master plans or logical subareas thereof as approved by the County, and *not solely individual project needs.*

Such a holistic approach would allow for thoughtful planning for not only the land uses and development that was included in the RMAP, but projects which are now reasonably foreseeable and would also impact the RMAP, including the California Community Medical Center hospital (also referred to as "CMC") which was not contemplated in 1995. Such an approach would enable better planning for roadways (including Rio Mesa Boulevard), and other infrastructure (water, sewer etc.) needed to serve previously approved and future contemplated land uses. A piecemeal approach, such as the proposed Project and related MND reflects, in our clients' view, poor planning and is contrary to CEQA's requirements.

I. The Project, if approved as Proposed and without any Amendments to the RMAP and County General Plan, would violate the Planning and Zoning Law (Gov. Code, § 65000)

Section 3.3.5 of the RMAP states that where Area Plan Amendments are required, the General Plan must also be updated. (RMAP, § 3.3.5, subd. (b).) Area Plan Amendments are required when there are "[c]hanges to the text or map of the Area Plan", other than minor changes which do not alter the effect of existing policies or guidelines. (RMAP, § 3.3.5, subd. (b)(1).)

In relation to the RMAP, the proposed Project, if approved, would change: (1) the location of the arterial street (loop road) shown on the Circulation Map in the RMAP (2) reduces the number of lanes from 6 to 4 of the loop road; and (3) adds a new arterial street. This implicates the RMAP Section 3.2.2, "Circulation Concept Plan" regarding the internal loop patterns of Avenue 12 and Avenue 14; changes to major arterial and secondary arterial roads; and changes to collector lanes. Thus, amendments to the RMAP and the General Plan are required to ensure internal and horizontal consistency as required by the State Planning and Zoning Law.

Under the Planning and Zoning Law, the General Plan serves as the "constitution" for land-use decisions. (*O'Loane v. O'Rourke* (1965) 231 Cal.App.2d 774, 782.) Because the General Plan sits atop the hierarchy of a local agency's land-use policy, entitlements approved by the agency must be consistent with the agency's General Plan. (Gov. Code, § 65860, subd. (a)(2).) "The thrust of the statutory scheme … is to insure that decisions made by local governmental entities … will be the result of considered judgment in which due consideration is given to the various interrelated elements of community life. The statutes make clear, however, that local control is at the heart of [the] process." (*Bownds v. City of Glendale* (1980) 113 Cal.App.3d 875, 880.)

In this spirit, under CEQA, an initial study must also contain "[a]n examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls." (Guidelines, § 15063, subd. (d)(5); *Environmental Planning & Information Council v. County of El Dorado*, *supra,* 131 Cal.App.3d 350.) The IS/MND fails to describe how the Project is consistent with the General Plan, RMAP and adopted plan line amendments. Of particular concerns are inconsistencies with the Project and Goals 2 and 4 and Polices 1.1, 2.1, 3.2.2, 3.3.5 of the RMAP and that the MND does not specify state how it is inconsistent with the Madera County General Plan and RMAP. (Guidelines, § 15063, sudb. (d)(5); see e.g. *Kutzke v. City of San Diego* (2017) 11 Cal.App.5th 1034, 1039–1040 [MND found inadequate when inconsistent with community plan].)

For example, discussion of the General Plan is largely absent from the IS/MND. The IS/MND lists the applicable General Plan policies in "Regulatory Setting" sub-sections in only three sections, Tribal Cultural Resources, Transportation/Traffic and Biological Resources. To the limited extent that General Plan and RMAP goals and policies are presented, discussion is limited. The sections on Transportation/Traffic and Biological Resources do nothing more than list the applicable General Plan policies. There is no meaningful discussion of whether the Project is actually inconsistent with the policies, of particular concern is Policy 1.1. The RMAP must be amended.

Finally, the IS/MND Project description includes the following statements that should be corrected or otherwise addressed:

- The Project description states that it will implement the adopted Rio Mesa Boulevard Plan Line ("Plan Line"), yet the Project would be inconsistent with the Plan Line in at least two ways. First, Avenue 14, depicted in the Project description, is not shown on the Rio Mesa Plan Line Map in the adopted Resolution. Second, the route of Road "A" as proposed appears to deviate from the location that is depicted in the Plan Line. Please clarify.

- The MND project description does not include information regarding the length of the proposed storm drainage line that would be placed in the street consistent with the Figure 4a and discussed in the Hydrology /Water Quality analysis.

- Figure 4a and 4b ("Rio Mesa Plan Area Typical Roadway Sections") are not RMAP Maps, as stated. The RMAP was drafted in 1995. These maps are dated June 19, 2017 and prepared by Morton Pitalo (associated with the Viejo Tesoro Subdivision Design), so they could not have been included in the RMAP. It is unclear if the County has adopted the Tesoro Viejo's subdivision design as a "typical roadway" and, if so, this would appear to be more appropriately disclosed to the public via an update to the RMAP or through adoption of a new specific plan.

II. CEQA Requires Preparation of an EIR rather than an MND when Substantial Evidence in the Record raises a "Fair Argument" that the Project May Cause Significant Impacts on the Environment

CEQA, the Guidelines, and case law "reflect a preference for requiring an EIR to be prepared" rather than MNDs. (*Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 332).) This is consistent with CEQA's purpose of affording the maximum amount of protection to the physical environment, by providing decision makers and the public with all the information necessary to determine a project's impacts, individually and cumulatively. (See Pub. Resources Code, §§ 21000, subd. (g), 21061; *Mountain Lion Foundation v. Fish & Game Com.* (1997) 16 Cal.4th 105, 112 [Intent of CEQA is to give "prime consideration to preventing environmental damage when carrying out their duties."].)

An EIR is required whenever substantial evidence in the record supports a "fair argument" that significant impacts may occur, even if there is other evidence to the contrary. (CEQA Guidelines, § 15064, subds. (a)(1), (f)(1); *Friends of B Street v. City of Hayward* (1980) 106 Cal.App.3d 988, 1000-1003; *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75; *Oro Fino Gold Mining Corp v. County of El Dorado* (1990) 225 CA.App.3d 872, 881 [the word "may" infers a "reasonable possibility"].) This is an intentionally "low threshold." (*No Oil, supra,* 13 Cal.3d at p. 75; *Citizens of Lake Murray Area Assn. v. City Council* (1982) 129 CA.App.3d 436, 440 [threshold is intentionally low as an MND has a "terminal effect on the environmental review process."].) Only if it is "clear[]" that there will be no significant direct or indirect environmental impacts can a lead agency opt to issue an IS/MND, as opposed to an EIR. (Guidelines, § 15070, subd. (b)(1); see also § 15064, subd. (g).)

Whether there is "substantial evidence" supporting a fair argument that an EIR is required is viewed "in light of the whole record before the lead agency." (See Pub. Resources Code, §§ 21080, subd. (c); 21082.2, subds. (a),(d).) Substantial evidence is "facts, a reasonable assumption predicated on facts, or expert opinion supported by fact." (Pub. Resources Code, § 21080, subd. (c); Guidelines, § 15384, italics added [substantial evidence is "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, *even though other conclusions might be reached.*"].)

Where, as here, a disagreement between an expert opinion submitted by the public and an expert opinion relied upon in a MND does *not* lead to a presumption that the expert opinion presented by the lead agency is entitled to deference; in fact, it leads to the opposite conclusion. "If there is disagreement among expert opinion supported by facts over the significance of an effect on the environment, the Lead Agency shall treat the effect as significant and shall prepare an EIR." (Guidelines, § 15064, subd. (g).) Public comments are substantial evidence, when credible, supported by a factual basis, and particularly when corroborated by experts. (See, e.g., *Pocket Protectors v. City of*

Sacramento (2004) 124 Cal.App.4th 903, 932; *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 3339-340.)

The requirement to analyze direct, indirect and cumulative impacts applies to an IS/MND. (*County Sanitation Dist. No. 2 v. County of Kern* (2005) 127 Cal.App.4th 1544; *City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398.) "If the agency determines that there is substantial evidence that any aspect of the project, either individually or cumulatively may cause a significant effect on the environment" the lead agency must prepare an EIR or conduct other subsequent environmental review. (Guidelines, §15063, subd. (b)(1).)

A "direct physical change" is "a physical change in the environment which is caused by and immediately related to the project." (Guidelines, § § 15064, subd. (d)(1).) A "indirect physical change" is "a physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project" which is "reasonably foreseeable." (Guidelines, § 15064, subd. (d)(2).) A cumulatively considerable impact is an impact that result from the incremental effect of a project, when viewed in connection with closely related past, current and probable future projects. (Pub. Resources Code, § 21063, subd. (b)(2); Guidelines, §§ 15064, subd. (h)(1), 15065, subd. (a)(3.)

III. Substantial Evidence shows that the Rio Mesa Boulevard IS/MND is Inadequate and an EIR must be Prepared

A. The MND's description of the Geographic Scope of the Project and the Environmental Baseline is Inadequate

Before the impacts of a project can be assessed and mitigation measures considered, an initial study must describe the existing environment (environmental baseline). (CEQA Guidelines, § 15063, subd. (d)(2).) It is only against this baseline that any significant environmental effects can be determined. (CEQA Guidelines, §§ 15125, 15126.2, subd. (a); see also *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 952; *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 319 [applying this requirement to an MND].) As the Supreme Court explained, a comparison must be made between "existing physical conditions without the [project] and the conditions expected to be produced by the project." (*Communities for a Better Environment*, supra, 48 Cal.4th at p. 328.) "Without such a comparison, the EIR will not inform decisionmakers and the public of the Project's significant environmental impacts, as CEQA mandates." (*Ibid.*)

The IS/MND's identification of the geographic scope of the Project area is stunted as is the description of the environmental setting; this causes the MND to understate all of the potentially significant impacts of the Project. Section 1.3 ("Surrounding Land Uses/Environmental Setting") and Figure 1, for example, purport to show the location of the Project and the environmental setting, including development within the vicinity.

However, instead of describing the existing baseline in detail, section 1.3 merely lists the zoning designations of an unspecified geographic area surrounding the Project, with a generic statement that the Project site is zoned agricultural. By failing to delineate a specific geographic scope of the project area that includes the "whole of the project," and a description of the resources and existing conditions within the Project area, the IS/MND fails as an informational document by taking an overly narrow approach to the project area and the environmental setting. This comment relates to the concerns our clients have with the County improperly piecemealing its environmental review.

B. The MND Includes an Analysis of only one part of development contemplated within a larger area, including infrastructure needed to serve the Community Medical Center Hospital Project; thus engaging in Improper Segmentation or "Piecemealing" under CEQA

The water, sewer and roadway improvements considered in the MND all appear to be part of an integrated development scheme to accommodate the Community Medical Center Hospital Project and, possibly, other development in the area. But for the Hospital and other development in the area, the proposed Project would presumably not include the water, sewer and roadway improvements as proposed.

Failure to consider the impacts associated with these foreseeable projects in a single EIR is a violation of CEQA which prohibits "piece-meal" or "segmented" review of what is, in fact, separate phases of the same project. Under CEQA, the lead agency must consider the "whole of an action" when determining whether it will have significant environmental effects. (CEQA Guidelines, §§ 15003, subd. (h), 15378, subd. (a).) This rule is designed to prevent an agency from "chopping a large project into many little ones" that may be individually insignificant but have cumulatively significant environmental effects. (*Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 283-284.)

The case law contains many examples of unlawful "piece-meal" environmental review, including those projects that piece-meal roadways and water and sewer improvements from the developments that they will service. *City of Antioch v. City Council* (1986) 187 Cal.App.3d 1325 is illustrative. In that case, the court found that a negative declaration wrongly issued for roadway and sewer improvements, when the related projects were not considered. A "[c]onstruction of the roadway and utilities cannot be considered in isolation from the development it presages." (*Id.* at p. 1337; see also *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 732 [EIR for residential development should have included sewer expansion that was a "crucial element[]" of development]; *Plan for Arcadia, Inc. v. City Council of Arcadia* (1974) 42 Cal.App.3d 712, 726 (*Plan for Arcadia*) [shopping center, parking lot, and adjacent road widening "should be regarded as a single project"]; *Arviv Enterprises, Inc. v. South Valley Area Planning Commission* (2002) 101 Cal.App.4th 1333, 1346-1348 [a series of residential building permit applications that, taken together, were deemed to be a single, integrated 21-unit housing development].)

The California Supreme Court has adopted the following test for determining whether unlawful piecemealing has occurred. An agency must analyze a future expansion or other action as part of the initial project "if (1) it is a reasonably foreseeable consequence of that initial project and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects." (*Laurel Heights Improvement Assn. v. Regents of Univ. of Cal.* (1988) 47 Cal.3d 376, 396 ("*Laurel Heights I*"); see also Pub. Resources Code, § 21065 [defining "project"].)

First, the proposed and adopted projects cited in the RMAP and IS/MND are physically proximate to the Project, including the Tesoro Viejo Development, Riverstone, and Gunner Ranch West, the CMC, North Fork Village, Rio Mesa Village, Avenue 12 Village.[3] The Project description itself states that its purpose is to provide roadway, sewer and water improvements to these Projects, which is dispositive that they must be considered together and as part of the whole of the Project. There is, therefore, a causal link between the need for the infrastructure improvements considered in the MND and other development which has not been analyzed. The references to the Tesoro Viejo project EIR in the concluding section of the IS/MND (see section 4.20) only strengthen the conclusion of related projects whose impacts have not been considered.

Second, the "future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects." (*Laurel Heights I, supra,* 47 Cal.3d at p. 396.) These developments would connect with the same water, sewer, and roadway infrastructure, both locally and regionally. By considering the impacts of these closely related Projects, the initial scope of the Project will "likely change." (*Id.*) For example, given their proximity, the projects will contribute substantial traffic to the same road network, and emit additional criteria pollutants. Similarly, given their proximity, the related projects will utilize the same water and sewer services, and create impermeable surfaces that will rely on the storm drains included in the Project. To address these impacts, the scope of the Project will "likely" enlarge.

Despite these overwhelming commonalities, the County is analyzing each project in a vacuum, as a stand-alone project. That constitutes impermissible piece-meal review. The County should therefore prepare an EIR which includes a single traffic analysis, water and sewer study, taking into account all development that would be served by the "whole of the project." The analysis should be presented in an EIR. That will provide the County with an opportunity to determine whether mitigation measures or alternatives are available to address the combined contribution of the proposals to the County's infrastructure network.

---

[3] / As detailed above, because of the constrained geographic scope of the project area and the MND's anemic project description, it is difficult to gauge through the MND which other developments would be served by the water, sewer and roadway improvements.

C. The Project may result in Potentially Significant impacts to Biological Resources

Per the IS/MND the proposed Project area is undeveloped and provides potential habitat for over two dozen special status species listed under California or Federal law. Three special status species are present or considered to be present, on site. Therefore, the biological resources section is of particular concern. RMM therefore commissioned Live Oak Associates, Inc. to peer review the MND's analysis. A true and correct copy of their letter is attached as Attachment A and incorporated by reference. (Letter from David J. Hartesveldt, Senior Biologist, Live Oak Associates, Inc. (November 17, 2017).)

Mr. Hartesveldt reviewed the October 2017 IS/MND and underlying *Biological Resources Assessment* prepared by ECORP, attached as Exhibit B to the IS/MND. Mr. Hartesveldt's review was "facilitated by my familiarity with the Rio Mesa Planning Area. My staff and I have conducted biological studies on virtually all of the parcels within the Planning Area during the past 22 years, as well as many nearby parcels in Fresno and Madera Counties." (Attachment A, at p. 1.) Live Oak was tasked with assessing the accuracy and thoroughness of the information presented, the feasibility of the mitigation measures proposed, and analyzed a potentially less environmentally damaging alternative (a Rio Mesa Boulevard project with a different alignment.)

Some of Mr. Hartesveldt's conclusions are below. Please see Attachment A for further details.

> 1. The IS/MND accurately identifies project impacts, but impacts are not quantified. It is difficult for the reader to assess the feasibility of proposed mitigation measures or their utility in reducing impacts to a less than significant level without knowing the magnitude of impacts.
>
> 2. The IS/MND requires compensatory mitigation for the loss of habitat suitable for state and federally threatened and endangered species without identifying where the compensatory mitigation would be located. Thus, the reader of the IS/MND cannot determine if the stipulated mitigation requirements are feasible.
>
> 3. The IS/MND does not compare project impacts resulting from the revised Rio Mesa Boulevard alignment with the original alignment proposed in the Rio Mesa Area Plan approved in 1995. The reader cannot know from reading the IS/MND which is the environmentally least damaging alignment.
>
> 4. The IS/MND requires "take" coverage for state and federal threatened and endangered species per provisions of Section 7 or Section 10 of the federal Endangered Species Act and Section 2081 of California Fish and Game Code without any apparent consultation with these agencies. The feasibility of the project rests on possible mitigation requirements of these agencies, which are currently not known.

> 5. The Rio Mesa Boulevard project will facilitate the development of the larger Rio Mesa Planning Area, an area that includes large areas of critical habitat for federally listed threatened and endangered species. Because the IS/MND only evaluates anticipated project impacts within the project footprint, the reader cannot assess with clarity the growth-inducing effects of the proposed project on state and federally threatened and endangered species, or their critical habitat.

Regarding Mr. Hartesveldt's first concern, for example, the Project site includes vernal pools, including a vernal pool where vernal pool fairy shrimp and San Joaquin Valley Orcutt Grass are present or considered to be present on site. (IS/MND at pp. 4-40; 4-42 to 4-43.) The IS/MND states that vernal pools will be avoided, but this only accounts for direct impacts. The Project does not analyze to what extent the placement of infrastructure will have on the continued viability of the pools (i.e., severing the pools from their sources of water or water recharge or water quality impacts from surface water runoff). In other words, the reasonably foreseeable and potentially significant indirect effects appear missing.

Regarding another of Mr. Hartesveldt's concerns, the IS/MND adopts the construction of wildlife corridors as a mitigation measure to reduce impacts to wildlife migrating through the site, without analyzing the measure's efficacy or feasibility. This approach has been soundly rejected by the courts. (See *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70, 95 [CEQA permits deferral of mitigation only when: (1) an EIR contains criteria or performance standards to govern future actions; (2) practical considerations preclude the development of earlier measures; and (3) the lead agency has assurances that the future mitigation will be both "feasible and efficacious."]; *Raptor, supra,* 149 Cal.App.4th at pp. 669-71 [county improperly deferred mitigation when it allowed a land management plan for special status vernal pool species to be developed with the California Department of Fish and Game ("CDFG") and USFWS after certification of EIR]; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359, 1396 [conditioning a permit on "recommendations of a report that had yet to be performed" constituted improper deferral of mitigation].) Here, there is no criteria stating the performance standards that will be used to measure the success of the corridors. The IS/MND does not provide assurances that the future mitigation will be both feasible and efficacious. The scant description of the mitigation measure in the IS/MND does not demonstrate "'the analytic route the ... agency traveled from evidence to action" as required for a mitigation measure "'when a project is approved that will significantly affect the environment.'" (*Lotus v. Department of Transportation* (2014) 223 Cal.App.4th 645, 654 [analyzing mitigation measures].)

D. The MND's Transportation/Traffic Analysis is Inadequate

Attachment B to this letter, also fully incorporated by reference, is a report dated November 19, 2017 from Daniel Smith of Smith Engineering & Management. Mr. Smith reviewed the transportation/traffic section of the IS/MND and its Appendix F, *Traffic Impact Study.*

As noted in the attached letter, Mr. Smith concluded, "[t]here is substantial evidence that the IS/MND 4.17 Transportation/Traffic Section draws conclusions that are not supported by fact or are contrary to fact or are otherwise inadequate and thus unsuited for certification in its current condition. The document must be revised and recirculated in draft status." (Attachment B, at p. 8.) Mr. Smith's conclusions are summarized below. Please see Attachment B for further details.

1. Inconsistencies between the Project as described in the IS/MND and as described and analyzed in Appendix F. For example, the Project Description describes Rio Mesa Boulevard as a 4-lane roadway, while Appendix F describes it as a 2-lane road.

2. Numerous inconsistencies with the proposed roadway segment alignment and improvements for Rio Mesa Boulevard (identified in the Rio Mesa Area Plan as the "Looped Road") and the adopted Rio Mesa Area Plan.

3. Numerous inconsistencies with the Rio Mesa Boulevard and Flag Barn Way Plan Line.

4. The finding in IS/MND Section 4.17.3 in checklist item (a) is inconsistent with known facts and input from CalTrans.

5. The finding In IS/MND Section 4.17.3 in checklist item (d) is inconsistent with known facts

6. Contravening the IS/MND's conclusion of no impacts under Section 4.17.3 in checklist item (e), the IS/MND provides no analysis of where emergency responder access in the area east of SR 41 between Avenue 12 and Avenue 15.

7. Only short-term, but not long range analysis of SR 41 intersections or main line sections is carried out in the IS/MND or Appendix F. This is not in compliance with provisions of Caltrans *Guidelines for Preparation of Traffic Impact Studies* which must be complied with for projects that potentially impact State Highway Facilities

Regarding Mr. Smith first and second concerns, for example, the Project is inconsistencies with the RMAP section 3.3.2 goals and policies, concerning linkages, maintaining a "D" level of service for intersections during peak hours, and polices regarding extensions to Avenues 10, 12, and 15.

Furthermore, the inadequacy of the project description, described above, renders the traffic analysis inadequate, because by failing to discuss related projects, the IS/MND does not analyze the "whole of the project" as required under CEQA. Information provided in transportation/traffic makes these deficiencies even more acute. For example, in section 4.17.2, the Project is again described as being within the RMAP. However, instead of referencing either the projects listed in the RMAP, as described above, or in the projects listed in Section 2.1 of the IS/MND, the setting is described as including "North Fork Village, Rio Mesa Village, and Avenue 12 Village." The CMC (Hospital) is not mentioned. It is unclear what relation, if any, these projects have to Tesora Viejo Development, Riverstone, and Gunner Ranch West or the projects listed in the RMAP. Likewise, none of these newly-referenced developments are listed in Figure 1.

E. The Project will Result in Potentially Significant Growth Inducing Impacts which requires preparation of an EIR

The IS/MND fails to account for the likely and significant growth-inducing impacts resulting from the Project, as required by CEQA. The County must conduct further environmental review in an EIR to consider these impacts. (See *City of Antioch, supra,* 187 Cal.App.3d 1325.) An MND was struck down when it failed to consider the growth-inducing impacts of infrastructure development. As the court stated, "[t]he sole reason to construct the road and sewer project is to provide a catalyst for further development in the immediate area." (*Id.* at p. 1337; see also *Citizens Assn. for Sustainable Development v. County of Inyo* (1985) 172 Cal.App.3d 151.)

It is particularly important to analyze growth inducing impacts where, as here, the area is currently agricultural. In *Stanislaus Audubon Society, Inc. v. County of Stanislaus* (1995) 33 Cal.App. 4th 144, 147, an MND was overturned for golf course project because substantial evidence supported a fair argument that the project would induce residential growth in an undeveloped area. (*Id.* at p. 147.) The county argued that the project would not be growth-inducing because the area around the site was zoned for agricultural use. (*Id.* at p. 156.) Even though the applicant, who also owned the surrounding area, stated that he intended to maintain the surrounding area in agricultural use, the court flatly rejected the county's theory, stating "the record before us contains no assurances that the area surrounding the project will not one day be rezoned...thus permitting the residential development." (*Id.* at p. 157.)

The Project description expressly states that the improvements will service existing developments, and proposed residential and commercial developments, including the Hospital/medical center, but the growth inducing impacts are not analyzed for any of these proposed future developments. For example, in 2017, the CMC announced that it had purchased 200 acres of land at SF 41 and Avenue 12 for the purpose of constructing a new facility. (See Attachment C, a true and correct copy of an article entitled "McCaffery Homes, A New Vision for the Flag Barn (Mar. 20, 2017)[noting that "we're thrilled that Community Medical Centers (CMC) has purchased our 200-acre flag barn property at the northeast corner of Highway 41 and Avenue 12"].)

The County also created a Public Financing Authority (August 22, 2017) to implement an Enhanced Financing Plan for the CMC project, and has moved forward (September 19, 2017) with directing that an Infrastructure Financing Plan be prepared. The potential impacts from the facility are more than likely to be significant, given its size. By way of comparison, CMC's facility in downtown Fresno, is approximately 37 acres, contains numerous multi-story buildings, including a multi-level parking garage, a 58,000-square-foot Emergency Department, a surgical center that provides 3,600 cardiovascular procedures a year, and an on-campus a "17,000-square-foot home established to provide a supportive residence for families while their loved ones receive critical care in the hospital." (See Attachment C "California Community Medical Center" (as of November 17, 2017).) The facility proposed in the vicinity of the Project could be quadruple this size, provided that roadways, sewer and water services are available. Yet, the growth-inducing impacts of the Project, which would provide these very services, is not analyzed.

As in *Stanislaus,* the "Project is currently surrounded by open/undeveloped land" (See MND Section 1.3) and the "project area mainly consists of agricultural land (MND Section 4.101.1.) For example, the addition of Avenue 14 between Esplante and Arroyo will connect the road to the Tesoro Viejo Specific Plan, at its southern border. This will create a second point of access to approximately 233 acres of agricultural land, in addition to Road 204. [4] A similar growth inducing impact will occur on the Rio Mesa Boulevard section of the proposed Project. The RMAP agricultural land use policies (section 3.2.1) state that agricultural uses should be retained "until development to urban uses becomes viable and can readily be serviced." (Policy 3.1) The Project provides those services that will make development to urban uses viable.

Yet, despite the overwhelming evidence that the Project's intent is to enable significant residential and commercial growth, these related impacts are not discussed, or even mentioned in the IS/MND sections on traffic, land use and planning, utilities and public services, recreation, population and housing, or noise. Without this information, the public and the decision-makers cannot assess how many employees, patients, and residents will now be utilizing the area, and the attendant impacts. As in *City of Antioch,* further environmental review is required to analyze these growth inducing impacts.

F. Cumulative Impacts

The IS/MND fails to consider the Project's cumulatively considerable impacts, as required by CEQA. Unlike the requirement to analyze the baseline, which considers the existing physical environment, a cumulative impacts analysis considers potentially significant impacts resulting from incremental effects of a project, when viewed in connection with closely related past projects, current projects, and probable future projects. (Pub. Resources Code, § 21063, subd. (b)(2); Guidelines, §§ 15064, subd. (H)(1), 150665, subd. (a)(3.); *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1213 [failure to analyze related projects a "overarching legal flaw'" in EIRs]; *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 114 disapproved on other grounds in

---

[4] Affecting APN's 051-022-018, -019, -020, -021, -022, -023, -024, -025, and -026.

Berkeley Hillside Preservation v. City of Berkeley (2015) 60 Cal.4th 1086 ([“Cumulative impact analysis is necessary because the full environmental impact of a proposed project cannot be gauged in a vacuum].)

The IS/MND Section 2.1 states that the Project is part of the “greater Rio Mesa Area Plan” which purports to include three approved “large scale residential development projects” – Tesora Viejo Development, Riverstone, and Gunner Ranch West, and references a “future Community Medical Center” (“CMC”) planned for the northeastern quadrant of the Avenue 12/SF-41.”

First, it is unclear from this scant description whether the County considers the CMC part of the Rio Mesa Plan area, and what the controlling planning document is the for Project area. It is our understanding that the Riverstone and Gunner projects are not within the RMAP plan boundary.

Second, despite referencing the RMAP, the IS/MND does not include a map of the RMAP plan boundary and indicate where the Project falls within it. Looking at the RMAP itself, approved in 1995, does not shed light on these issues. RMAP section 2.4.3 states that there are “[s]everal development proposals within the Rio Mesa project are currently being studied” and lists “River Ranch, Visata Lago, Riverbend Ranch, Hix-Reubenstein Development, and the Fresno Christian School Complex.” It is unclear what relation, if any, these projects have on the Project and if the Project is needed to serve these developments.

Because no further details are provided regarding these past, current, and probable future projects, the public cannot gauge, and the IS/MND fails to analyze, the Project’s contribution to related cumulative impacts, in violation of CEQA. (See *Environmental Planning & Information Council v. County of El Dorado* (1982) 131 Cal.App.3d 350, 358.)

G. Hydrology and Water Quality

The section omits estimates of the existing storm water runoff and water quality in the area under existing conditions and the projected amount of runoff and water quality impacts by the substantial increase in impermeable roadway, curb and gutter, and side walk surfaces and medians that would occur under the proposed project. Furthermore, the IS/MND does not quantify the “time of concentration” of storm water runoff created by impervious surfaces, curbs and gutters, and collection pipelines. Without this information, it is difficult to ascertain whether storm water delivered to the points of discharge will overwhelm existing drainages or cause a disruption to those systems from erosion.

H. GHG and Air Quality

The section on greenhouse gas ("GHG") reflect the concerns raised above concerning improper segmentation of this Project from the whole of the action. The findings of less-than-significant GHG impacts in all relevant categories are based on the erroneous assumption that "the completed Project will not resulting a permanent increase in traffic" and thus there will be no increase of GHG emissions from mobile sources. (IS/MND, p. 4-73, 4-74.) As discussed above, the Project is part of a "whole" which includes related residential and commercial development, including a significant new medical facility / hospital. Properly viewed as part of this "whole project" is reasonably foreseeable that there will be an increase in GHG from mobile sources which may be significant.

The section on air quality is deficient for similar reasons. The Project is providing the infrastructure for a "whole project" that includes residential and commercial development. Further environmental review must consider if those developments will cause air quality to decrease in what is already a compromised basin.

IV. Conclusion/ Request for Future Notice(s)

Thank you in advance for your consideration of these comments. We hope that the County agrees to take a step back to consider development of the whole of the Project, and the area generally, as part of an update to the General Plan and/or amendment to the RAMP after preparation of an EIR.

In addition to providing these comments, we request that the County provide our office with copies of any and all future public notices issued in connection with the Project, including for the Planning Commission and Board of Supervisors hearings. If the County decides to approve the Project, please send us a copy of the Notice of Determination immediately upon filing. (Pub. Resources Code, §§ 21152, 21167, subd. (f).)

Very truly yours,

ALeisy

Andrea K. Leisy

Encl.

Attachment A

LIVE OAK ASSOCIATES, INC.
an Ecological Consulting Firm

November 17, 2017

Ms. Jamie Bax, Senior Planner
Madera County
Community and Economic Development Department
200 W 4th Street, Suite 3100
Madera, CA 93637

RE: Review of the Initial Study and Mitigated Negative Declaration, Rio Mesa Boulevard Project

Dear Ms. Bax:

At the request of Remy Moose Manley, LLP, I have reviewed the Initial Study/Mitigated Negative Declaration for the Rio Mesa Boulevard Project in Madera County. My primary assignment has been to assess the accuracy and thoroughness of the information presented in the IS/MND, as well as the feasibility of mitigation measures proposed for significant impacts. However, in consideration of the fact that the IS/MND addresses a Rio Mesa Boulevard project within a different alignment than shown in the original plan, a secondary objective of my review was to compare the magnitude of impact to sensitive biological resources from the two alignments to see if one is less environmentally damaging than the other.

The IS/MND that I have reviewed is dated October, 2017, and was based on *Biological Resources Assessment* prepared by ECORP Consulting, Inc. in 2017. This biological resources assessment can be found in Appendix B of the IS/MND.

My review of the Rio Mesa Boulevard IS/MND has been facilitated by my familiarity with the Rio Mesa Planning Area. My staff and I have conducted biological studies on virtually all parcels within the Planning Area during the past 22 years, as well as many nearby parcels in Fresno and Madera Counties. Our firm, Live Oak Associates, Inc., is therefore very familiar with the biology of the planning area, as well as the state and federal regulatory issues that could be relevant to the Rio Mesa Boulevard project. It is unlikely that any environmental/ecological consulting firms have as thoroughly surveyed the Rio Mesa Planning Area as has Live Oak Associates, Inc.

Based on my review, I have concluded the following:

1. The IS/MND focuses solely on the biological resources of the project footprint. The biological resources of the project footprint have been accurately identified.
2. The IS/MND accurately identifies project impacts, but impacts are not clearly quantified. It is difficult for the reader to assess the feasibility of proposed mitigation measures or

their utility in reducing impacts to a less than significant level without knowing the magnitude of impacts.

3. The IS/MND requires compensatory mitigation for the loss of habitat suitable for state and federally threatened and endangered species without identifying where the compensatory mitigation would be located. Thus, the reader of the IS/MND cannot determine if the stipulated mitigation requirements are feasible.
4. The IS/MND does not compare project impacts resulting from the revised Rio Mesa Boulevard alignment with the original alignment proposed in the Rio Mesa Area Plan approved in 1995. The reader cannot know from reading the IS/MND which is the environmentally least damaging alignment.
5. The IS/MND requires "take" coverage for state and federal threatened and endangered species per provisions of Section 7 or Section 10 of the federal Endangered Species Act and Section 2081 of California Fish and Game Code without any apparent consultation with these agencies. The feasibility of the project rests on possible mitigation requirements of these agencies, which are currently not known.
6. The Rio Mesa Boulevard project will facilitate the development of the larger Rio Mesa Planning Area, an area that includes large areas of critical habitat for federally listed threatened and endangered species. Because the IS/MND only evaluates anticipated project impacts within the project footprint, the reader cannot assess with clarity the growth-inducing effects of the proposed project on state and federally threatened and endangered species, or their critical habitat.

Approval of the IS/MND as written provides no assurance that the project could be built without significant unavoidable effects on biological resources of the Rio Mesa Planning Area, and it provides no assurance that the project could be permitted by the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. A comprehensive conservation planning strategy for the larger Rio Mesa Planning Area would likely be a more fruitful approach for meeting the requirements of CEQA, as well as the state and federal Endangered Species Acts.

My more detailed comments follow:

1. **Environmental Setting.** The IS/MND defines the study area as the project grading limits, a temporary construction easement, construction staging areas, and a 250-foot buffer. The environmental setting section of the IS/MND accurately identifies the biological resources of the study area. The biological resources of adjacent lands served by the proposed road project have not been addressed. Assuming that the construction of Rio Mesa Boulevard will facilitate the development of adjoining lands, the reader cannot know from the IS/MND what those project effects might be.

2. **Project Impact.** The IS/MND accurately identifies project impacts that may be expected from project construction. It does not, however, identify the magnitude of impact to biological resources, or engage in any analysis as to the significance of the impact. The reader is left to assume that an impact is significant, because mitigation is being required. The reason an impact warrants mitigation is therefore inferred, not understood from the text of the IS/MND.

   For example, the discussion of impacts to the California tiger salamander (page 4-54), a state and federally listed species, accurately notes that the study area provides suitable habitat for this species, and additionally, that critical habitat is present. Presumably (again, the reader is left to assume) the footprint of project disturbance will affect both California tiger salamander (hereafter referred to as CTS) breeding habitat (i.e., vernal pools) and upland oversummering habitat (grasslands inhabited by rodents), but the reader has no idea how much of each habitat type will be affected.

To clarify this point, the IS/MND notes that approximately 3.5 acres of vernal pool habitat is present within the study area. Are all 3.5 acres of vernal pool habitat suitable as CTS breeding habitat? Will the project directly disturb all 3.5 acres? The IS/MND does not say. While the mitigation ratio has been set at 2:1 (acres of compensatory mitigation to acres of impact), the reader cannot determine if the project must provide 7 acres of compensatory mitigation, or something less. With mitigation costs for compensatory vernal pool mitigation ranging from $250,000 to $350,000 per acre, the reader is left to wonder if the proposed mitigation is even feasible for this project.

The same can be said about the loss of upland oversummering habitat. The IS/MND indicates that approximately 343 acres of the study area is upland habitat (grasslands, orchard, and agriculture). How much of that acreage constitutes suitable CTS upland habitat? How much of the suitable CTS habitat will actually be disturbed by the project? If 300 acres of upland habitat suitable for CTS are eliminated such that the project must provide 900 acres of compensatory mitigation, can the project afford the price, assuming 900 acres of suitable habitat can be found? The IS/MND is silent on this issue.

3. **Compensatory Mitigation.** As noted above, the IS/MND addresses the need for compensatory mitigation. Although the reader cannot determine from the IS/MND how much mitigation will be required, the total area of preserved or restored habitat could be considerable. The IS/MND provides no information as to where this compensatory mitigation will occur. It should be noted that all CTS south of the Fresno River in Madera County are in a distinct recovery unit, and that impacts to CTS within that recovery unit must be mitigated within that recovery unit. In short, impacts to CTS habitat (breeding or upland) within the Rio Mesa Planning Area cannot be mitigated by conserving land north of the Fresno River. Recent projects in Fresno and Madera Counties have had considerable difficulty in locating lands in those counties that would be suitable for compensatory mitigation. Therefore, the feasibility of conserving enough CTS habitat to mitigate impacts per the requirements of the IS/MND are a function of both cost and the availability of suitable habitat south of the Fresno River. The IS/MND fails to address this issue entirely.

4. **Comparing Project Impacts of the Original Rio Mesa Boulevard Alignment with the new Rio Mesa Boulevard Alignment.** The IS/MND must assess the likely impacts to jurisdictional waters and endangered species habitat from both road alignments to determine which is the least environmentally damaging. The IS/MND does not address this issue. Thus, no comparison was possible.

5. **Regulatory Requirements of the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.** Key mitigation proposed by the IS/MND involves obtaining "take" coverage from the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife for upwards of five state and federally listed threatened and endangered species. It appears that ECORPS consulted with these agencies to determine the state and federally listed species present in the project vicinity, but it did

not apparently assess the likely permitting requirements typical of these agencies in Fresno and Madera Counties. Mitigation for the loss of a substantial amount of both suitable and critical habitat for one or more species may not be feasible. The feasibility of mitigating project impacts to the satisfaction of these agencies cannot be known without entering into to discussions with their staff.

6. **Growth Inducing Impacts.** The purpose of Rio Mesa Boulevard would ostensibly be to facilitate the development of various properties in the planning area. Ultimately, the construction of the project could result in the loss of a considerable area of critical habitat for as many as five species (see attached figure). The amount of critical habitat in the larger planning area is as follows (the acreages are approximate):

   - Succulent Owl's-clover (11, 560 acres)
   - San Joaquin Orcutt Grass (1,850 acres)
   - Hairy Orcutt Grass (2,560 acres)
   - Vernal Pool Fairy Shrimp (800 acres)
   - California Tiger Salamander (5,210 acres)

   Given the mitigation requirements imposed on other projects in the region, both by CEQA documents prepared for those projects, as well as by state and federal resource agencies, the IS/MND must address the long-term consequences of the Rio Mesa Boulevard project on the development of the Rio Mesa Planning Area as a whole.

In summary, the IS/MND would be a more useful document in understanding project impacts to biological resources if: (1) anticipated impacts to such resources were quantified; (2) compensatory mitigation measures identified the location of required conservation lands; (3) alternative road alignments had been evaluated for impacts to biological resources to see which alignment was the environmentally least damaging; (4) state and federal resource agencies had been consulted when developing mitigation strategies for the project to ensure that required mitigation measures are feasible; and (5) the growth-inducing impacts to the project could feasibly be mitigated. In light of the fact that the IS/MND has not demonstrated that the mitigation measures proposed for project impacts to state and federal threatened and endangered species are feasible, an EIR will need to be prepared for this project.

Sincerely,

David J. Hartesveldt

David J. Hartesveldt
Senior Biologist, Live Oak Associates, Inc.

DAVID J. HARTESVELDT Principal/ Senior Botanist & Wetland Scientist

EDUCATION

- Graduate Studies. Botany, San Jose State University, San Jose, CA. 1972 to 1976
- B.A. History, San Jose State University, San Jose, CA. 1969

AREA OF EXPERTISE

General botany, flora, wetlands and wildlife issues of California, threatened and endangered species, environmental regulations (CEQA, NEPA, CESA, Clean Water Act, Fish and Game Code), habitat restoration planning

PROFESSIONAL EXPERIENCE

- Live Oak Associates, Inc. (formerly Hartesveldt Ecological), Oakhurst, CA. Co-Owner, President, Senior Botanist and Wetland Scientist. 1995 to Present.
- Consulting Biologist 1986 to present.

PROFESSIONAL TRAINING

- Arid West Workshop, U.S. Army Corps of Engineers, Sacramento District. 4/08
- Wetland Delineation Refresher, Wetland Training Institute. 1/95
- Jurisdictional Delineation of Wetlands, San Francisco Bay Region, American Fisheries Society. 5/88

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

Association of Environmental Professionals (AEP), The Wildlife Society

QUALIFICATIONS

Mr. Hartesveldt is an experienced botanist and wetlands ecologist who has been studying the flora of California for much of his adult life. Although his particular interest is the flora of California, he has studied regional floras in Oregon and Minnesota, states in which he worked as a seasonal ranger for the National Park Service. He has provided consulting services to a variety of clients including local agencies, planning firms, attorneys, and developers. His areas of expertise include the following:

- **Delineation of Jurisdictional Waters**. Mr. Hartesveldt has completed specialized training in wetland delineation methodologies and during the past ten years he has completed numerous detailed wetland delineations. He has conducted studies in tidal marshes, diked salt marshes, freshwater marshes, ruderal seasonal wetlands, alkali wetlands, vernal pools, montane meadows, and farmed wetlands of the Central Valley.
- **Wetland Permit Assistance**. Mr. Hartesveldt has assisted clients in securing U.S. Army Corps of Engineers, California Regional Water Quality Control Board, and California Department of Fish and Game permits for filling wetlands and other jurisdictional waters. These permits frequently are conditional upon the preparation and implementation of mitigation plans that enhance existing wetland values or provide replacement habitat.
- **Special Status Species Surveys.** Mr. Hartesveldt has conducted numerous surveys for threatened or endangered plants and animals, and/or their habitats, and assisted his clients with mitigation that reduced impacts to such species.
- **Preparation of CEQA/NEPA Documents**. Mr. Hartesveldt has prepared portions of numerous EIR's, initial studies, and NEPA documents requiring reconnaissance level wetland delineations, special status species surveys, habitat mapping, etc. As a project manager for many of these projects, he has supervised interdisciplinary teams of biologists characterizing the biological setting of project sites and planning areas, determining project impacts, and developing conceptual mitigation plans consistent with the requirements of CEQA and NEPA.
- **Habitat Restoration Planning.** Mr. Hartesveldt has served as the lead biologist on a number of habitat restoration plans prepared as mitigation for project impacts to riparian, meadow and vernal pool habitats.

Attachment B

SMITH ENGINEERING & MANAGEMENT

November 19, 2017

Attn: Jamie Bax, Senior Planner
Madera County
Community and Economic Development Department
200 W 4th Street, Suite 3100
Madera, CA 93637

Subject: **Rio Mesa Boulevard Project Initial Study/Mitigated Negative Declaration** P 17028

Dear Mr. Bax:

At the request of the law firm Remy Moose Manley, I have reviewed the Initial Study / Mitigated Negative Declaration (the "IS/MND") prepared by the County of Madera (the "County") for the Rio Mesa Boulevard Project (the "Project"). My review is with respect to transportation/traffic considerations.

My qualifications to perform this review include registration as a Civil and Traffic Engineer in California and over 49 years professional consulting engineering practice in the traffic and transportation industry. I have both prepared and reviewed traffic and circulation analyses of environmental review documents, including for major roadway developments. My professional resume is attached.

Findings of my review are summarized below.

The Project Described in the IS/MND Project Description Is Not the Project Analyzed in IS/MND Appendix F Traffic Impact Study

The Project Description describes Rio Mesa Boulevard as a 4-lane roadway extending north from Avenue 12 east of and initially roughly parallel to State Highway 41 ("SR 41"). It states that the Project would construct the following roadway sections:

- Approximately 13,400 LF of Rio Mesa Boulevard from existing Avenue 12 to the sough line of Tesoro Viejo,
- Approximately 1,300 LF of Flag Barn Way/Avenue 12 from existing SR-41 to Rio Mesa Boulevard,
- Approximately 4,400 LF of Avenue 14 to connect Rio Mesa Boulevard to Tesoro Viejo's Lyles Drive, and
- Approximately 2,700 feet of north-south collector roadway (Road A).

It is not clear whether all of the road segments and alignments in the above Project Definition description are in the adopted Rio Mesa Area Plan Circulation Map or in the adopted Rio Mesa Boulevard and Flag Barn Way Plan Line.

IS/MND Appendix F traffic study considers Rio Mesa Boulevard as only a two lane roadway, not 4 lanes. It would extend northerly from Avenue 12 much as described in the Project Description but would only bend easterly to link with the alignment of Flag Barn Way and extend northerly on that alignment to Tesoro Viejo Boulevard within the Tesoro Viejo Specific Plan (see IS/MND Appendix F, Figure 1 as well as IS/MND Section 4.17, Figures 8 and 9).

The IS/MND needs to clarify its Project Description and needs to specifically evaluate that Project as described in all sections and demonstrate consistency with the adopted Rio Mesa Area Plan as well as with the adopted Plan Line for Rio Mesa Boulevard and Flag Barn Way.

Project Consistency with County Adopted Rio Mesa Plan

Based on the IS/MND Project Description, the proposed roadway segment alignment and improvements for Rio Mesa Boulevard (identified in the Rio Mesa Area Plan as the "Looped Road") is inconsistent with the adopted Rio Mesa Area Plan. Rio Mesa Boulevard or Looped Road is described in the Rio Mesa Plan as a north-south, 6-lane divided major arterial, not a 4-lane, undivided arterial as described in IS/MND Project Description. Moreover, the alignment of Rio Mesa Boulevard, between Avenues 12 and 14, pursuant to the adopted Rio Mesa Area Plan, is to provide a sweeping curve to the east. The apex of this easterly curve is located approximately 7,000 feet (±1.3 miles), east of the present SR 41 alignment.

As illustrated in Figure 1 of the IS/MND, Rio Mesa Boulevard as proposed would generally parallel SR 41, between Avenues 12 and 14. The separation between Rio Mesa Boulevard and the existing SR 41 alignment would only be approximately 2,600 feet (±0.5 mile). The modifications to the alignment and road design for Rio Mesa Boulevard, as descripted in the IS/MND clearly represents a significant deviation from the Rio Mesa Boulevard described in the adopted Rio Mesa Area Plan and the Program Environmental Impact Report (EIR) prepared and certified for the Rio Mesa Area Plan.

The proposed Flag Barn Way alignment and improvements are inconsistent with the Rio Mesa Area Plan. The Rio Mesa Area Plan does not identify or illustrate the implementation of a second north-south arterial. Only one north-south arterial, between Avenues 12 and 14 is identified in the Rio Mesa Area Plan Circulation Concept Plan and analyzed in the Rio Mesa Area Plan EIR. That north-south arterial is identified in the Rio Mesa Plan as the Loop Road, which now commonly refer to as Rio Mesa Boulevard.

The addition Flag Barn Way as a second north-south 4-lane, undivided arterial road, as described in the IS/MND, to serve development in the Rio Mesa Plan Area clearly represents a significant deviation from the adopted Rio Mesa Area Plan and EIR certified for the Rio Mesa Area Plan.

Such significant circulation deviations from the adopted Rio Mesa Area Plan warrants a General Plan Amendment[1], if the project is to move forward, as well as an analysis of the proposed modifications will have on traffic patterns internal and external to the Rio Mesa Area Plan, and more importantly, the effectiveness and performance, measured in the level of service (LOS) of existing as well as proposed roadway segments and intersections / interchanges to serve development of the Rio Mesa Plan Area.

The IS/MND needs to evaluate the Project's consistency with the adopted Rio Mesa Area Plan.

Project Consistency with County Adopted Rio Mesa Boulevard and Flag Barn Way Plan Line

The proposed Avenue 14 alignment is inconsistent with the Rio Mesa Boulevard and Flag Barn Way Plan Line. Avenue 14 east of SR 41 is delineated in the Plan Line as an east-west 4-lane, undivided arterial that ultimately curves south and terminates into Rio Mesa Boulevard.

As illustrated in Figure 1 of the IS/MND, Avenue 14 as proposed would extend east approximately 4,400 linear feet or roughly twice the distance east than what is delineated in the Plan Line. As proposed, Avenue 14 would not curve south and terminate into Rio Mesa Boulevard. Instead, a north-south collector (Road A) is proposed that would link Avenue 14 to Rio Mesa Boulevard.

---

[1] Area plans, authorized under Government Code §650301(b), allows individual sections of a general plan to be devoted to a particular subject or geographic area which must be internally consistent with the general plan. An area plan may only be adopted or amended by resolution as an amendment to the general plan in the manner set out in Government Code §65350 and the number of amendments is subject to the limits set forth in Government Code §65358 for general plan amendments.

The alignment of Avenue 14 between the future Esplenade Road and Arroyo in the Tesoro Viejo Specific Plan Circulation System as well as the proposed construction of Road A clearly conflicts with alignment of Avenue 14 reflected in the adopted Rio Mesa Boulevard and Flag Barn Way Plan Line.

Moreover, the Rio Mesa Boulevard and Flag Barn Way Plan Line is inconsistent with the Rio Mesa Area Plan. The Plan Line delineates planned capital roadway alignments and improvements inconsistent with Rio Mesa Plan. A findings of general plan consistency is required for capital improvement projects.

If the project is to move forward, the project would require amending the Rio Mesa Area Plan and / or the Rio Mesa Boulevard and Flag Barn Way Plan Line to address the inherent inconsistencies between the two County adopted documents, Furthermore, the proposed project may need to be revised so that it is consistent with both the Rio Mesa Area Plan and the Rio Mesa Boulevard and Flag Barn Way Plan Line.

The IS/MND needs to evaluate the Project’s consistency with the adopted Rio Mesa Boulevard and Flag Barn Way Plan Line.

The Finding In IS/MND Section 4.17.3 in Checklist Item (a) Is Inconsistent With Known Facts

Item (a) of the checklist in Section 4.17.3 Transportation/Traffic reads as follows: “Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?” The response checks the box for “Less Than Significant Impact”. This is in spite of the fact that the County is aware that the California Department of Transportation (“Caltrans”) has expressed concern that the planned alignment of Reo Mesa Boulevard would intersect Avenue 12 too close to the planned interchange of SR 41 with Avenue 12 for satisfactory operations there.

The Appendix F traffic study takes note of Caltrans concerns at page 6, so the County cannot claim to be unaware of the issue. The Traffic Study notes that if the greater volumes than anticipated it may eventually be necessary to relocate the roadway to accommodate the operation of two adjoining signalized intersection. Relocation of the proposed location would prompt an amendment to the adopted Plan Line as well as amendment to the Rio Mesa Area Plan Circulation Map as part of the County General Plan.

Caltrans has had a Route Concept Plan[2] for SR 41 adopted since July, 2013 that envisions upgrading SR 41 to a 4- or 6-lane freeway in the segment including the Avenue 12 intersection with an interchange at this location. Caltrans has had a certified EIR for upgrades to SR 41 in the subject area including an ultimate a grade separated interchange at Avenue 12 since early 2017 and is actively securing right-of-way for the interchange. Significant contributions to the cost of the Avenue 12 interchange are conditions of approval placed on the Riverstone project to the west of SR 41 and also contained in a Development Agreement in Appendix C, additionally both the southwest and northwest quadrants of the Ave. 12 interchange have been dedicated to the State of California by Riverstone. So there can be no claim that the interchange is a speculative project

Caltrans traffic forecasts for SR 41 in the area[3] are 26,675 Annual Average Daily Traffic ("AADT") in the current year (2017), 42,088 by 2027 and 57,500 by 2037, so it is likely that the SR 41 interchange at Avenue 12 will be needed in the near future.

The IS/MND traffic section and Appendix F traffic impact analysis have no comparable broad-based traffic forecasts. The documents merely speculate as to the amount of traffic that would use Rio Mesa Boulevard based on secondary sources. They conclude that traffic on Rio Mesa Boulevard would be about 2,000 ADT in 2035 if the Madera County Transportation Commission model, which anticipates that future development would be concentrated south of Avenue 12 is right, or about 13,000 per day if the Austin Quarry Project EIR, which reflects greater Rio Mesa area development, is right.

The documents compound this speculation relative to the Rio Mesa spacing from the proposed SR 41 – Avenue 12 issue by assuming that maybe, if the 2,000 ADT speculation is correct, the spacing may not be a problem at all.

Using these speculations to dismiss a clear Item (a) Plan Conflict concern is inconsistent with the good faith effort to disclose impact that CEQA demands. The IS/MND must respond in Section 4.17.3 Item (a) by checking the checkbox for "potentially significant impact" and proposing the obvious mitigation of shifting the alignment of Rio Mesa Boulevard eastward at least on its immediate approach to Avenue 12.

The IS/MND Response to Section 4.17.3 Checklist Item (d) Is Contrary To Fact

---

[2] A Route Concept Plan is Caltrans version of a long range plan of improvements to the route.

[3] See *Madera 41 South Expressway Draft Environmental Impact Report/Environmental Assessment and Section 4(f) Evaluation*, State of California Department of Transportation, SCH # 2015050174, December 7, 2016, page 9.

IS/MND Section 4.17.3 Checklist Item (d) states as follows: "Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? The IS/MND responds by checking the box "No Impact". However, the figures provided indicate the Project involves one or more Wye[4] intersections that are generally dangerous. County Road Standards do not allow Wye intersections in any case and these would be a very unusual design exception at arterial intersections. The Traffic Study acknowledges that the Rio Mesa Blvd. and Flag Barn Way Plan Lines have been adopted by the County. The creation of Wye intersection is contrary to County Standards the Plan Lines are significantly flawed and construction of Rio Mesa Blvd. by the proposed project would create a potentially significant impact and proposing the obvious mitigation of amending the Plan Line and Rio Mesa Area Plan to avoid a Wye intersection at the intersection of Rio Mesa Blvd. and Flag Barn Way is required.,

In responding that the subject Project would have "No Impact" in substantially increasing hazards due to a design feature, the IS/MND designation is clearly contrary to fact and inconsistent with the good faith effort to disclose impact that CEQA demands.

This section of the IS/MND also states that "the Proposed Project will not bisect farmland in a way that would leave sections of property that require the farmer to cross the road with farm equipment to access the parcel remnant. Therefore the project will have no impact."

However, Figure 1 Project Vicinity and Location map provided in the IS/MND that shows the proposed project overlaid on a recent aerial map does not support this assertion. Some parcels are evidently severed. Moreover, because some of the Project alignment will intersect existing farm roads that separate and connect various parcels, farm machinery may, in the future, have to travel *along or across the Project roadway* to conduct ordinary business.

The IS/MND is inaccurate and the checklist response should be changed to "Potentially Significant Impact". Of course, the other possibility is that the County really expects that development of the roadway will spur urban development of these lands (Madera County has already notified neighboring property owners that a major development project is being discussed –Moradi- on both sides of the proposed project) which demonstrates the enormous potential consequences for the "Agricultural Lands" and "Growth Inducing" sections of this IS/MND as well as for the traffic projections relied on in Section 4.17.3.

The Project As Analyzed in IS/MND Section 4.17.3 Could Result In Inadequate Emergency Access

---

[4] Wye intersections are intersections where roads intersect at extremely oblique angles somewhat comparable to railroad Wyes where tracks merge and diverge.

IS/MND Section 4.17.3 Checklist Item (e) inquires as follows: “Would the project result in inadequate emergency access?” The IS/MND checks the checkbox for “No Impact” and the discussion states that “Once operational the Proposed Project will improve traffic operations on local roadways and SR 41, which could potentially reduce delays for emergency vehicles. The proposed project will construct a new roadway where one does not currently exist and will not require full or partial closures or detours during construction activities or operation. Therefore, project will have no impact”.

However, the IS/MND provides no analysis of where emergency responders in the area east of SR 41 between Avenue 12 and Avenue 15 would be coming from and going to. The entire analysis is unsubstantiated, conjectural and fails to consider all relevant facts.

It is true that the Project would provide a desirable redundancy of access to SR 41 for emergency response to areas between Avenue 12 and Avenue 15, particularly for areas to the east of SR 41. But the analysis fails to take into account the way the construction schedule of Rio Mesa Boulevard is proposed. Rio Mesa Boulevard is to be constructed as a two-lane roadway until such time as the four-land section is deemed needed. If SR 41 were blocked by an operational event while Rio Mesa Boulevard is being upgraded from 2-lanes to 4-lanes, the IS/MND discussion phrase “will not require full or partial closures or detours during construction activities” would be incorrect.

Again, the IS/MND does not reflect the good faith effort to disclose impact that CEQA demands.

The IS/MND Fails to Provide a Long Range Analysis of Project Impact on State Highway Facilities

The IS/MND and its Appendix F provide a short term (2020) analysis of Project impacts on State Highway facilities such as at intersections with SR 41 by inflating existing traffic at presumed annual increase rates and by adding traffic assumed to be generated by the Tesoro Viejo development at its 2020 stage and also provide a SR 41 segment analysis based on the same traffic assumptions. However, long range analysis is limited to conjecturing whether the initial two-lane section of Rio Mesa Boulevard will remain adequate in 2035 based on the differing traffic forecasts of two secondary sources (the MCTA model and the projections of the Austin Quarry Project EIR).

No long range analysis of SR 41 intersections or main line sections is carried out in the IS/MND. This is not in compliance with provisions of Caltrans *Guidelines for Preparation of Traffic Impact Studies* which must be complied with for projects that potentially impact State Highway Facilities. Since this Project would shift the locations of over 100 trips entering and leaving the state highway in peak hours and would require general plan amendments, a long range analysis under those guidelines is necessary.[5]

Conclusion

There is substantial evidence that the IS/MND 4.17Transportation/Traffic Section draws conclusions that are not supported by fact or are contrary to fact or are otherwise inadequate and thus unsuited for certification in its current condition. The document must be revised and recirculated in draft status.

This concludes my current comments on the Rio Mesa Boulevard IS/MND.

Sincerely,

Smith Engineering & Management
A California Corporation

Dan Smith Jr

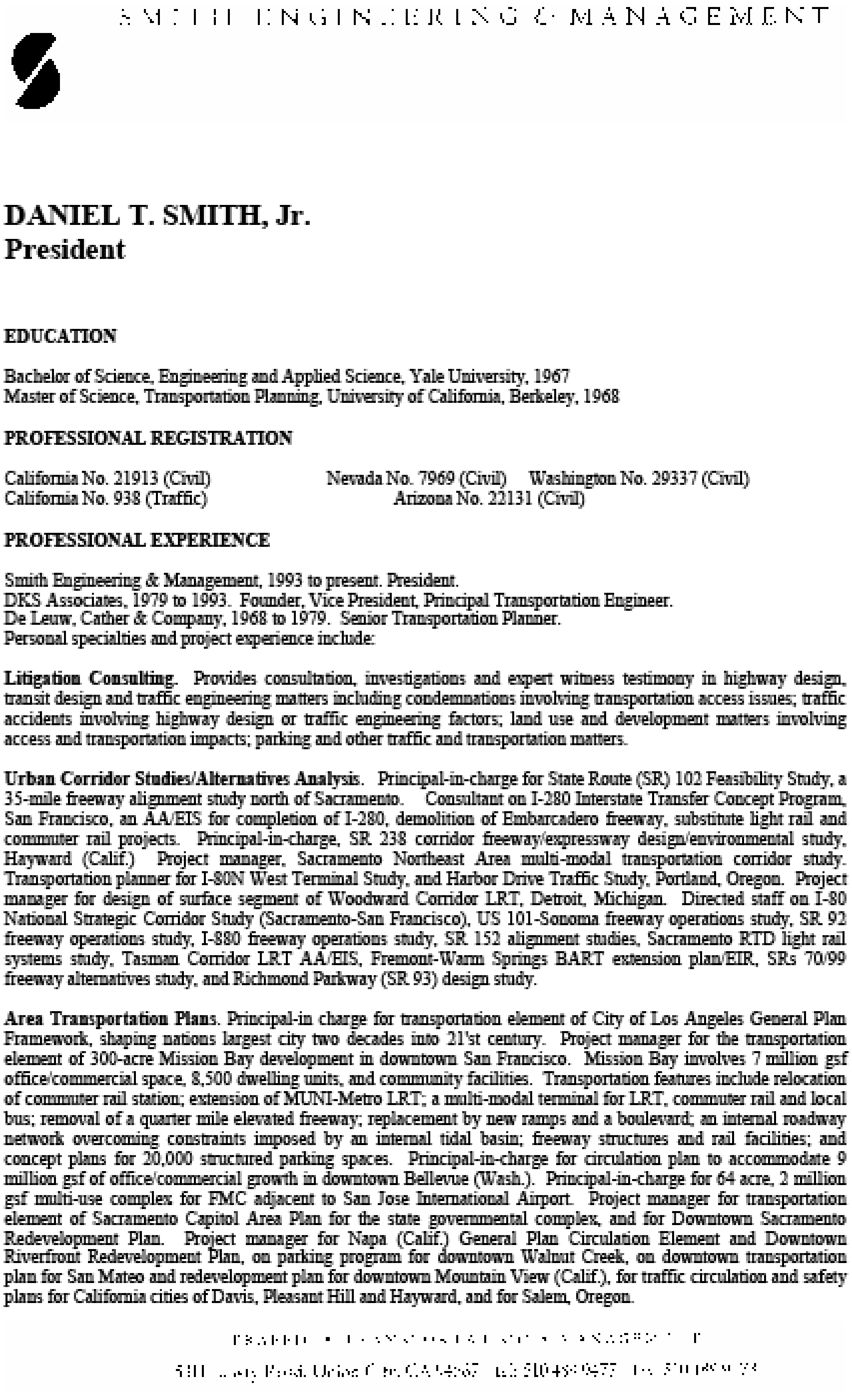
REGISTERED PROFESSIONAL ENGINEER
DANIEL T SMITH, JR.
No. 0938
Exp. 6-30-18
TRAFFIC
STATE OF CALIFORNIA

Daniel T. Smith Jr., P.E.
President

Attachment 1
Resume of Daniel T. Smith Jr., P.E.

---

[5] Caltrans *Guide for Preparation of Traffic Impact Studies* is available at www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf



SMITH ENGINEERING & MANAGEMENT

DANIEL T. SMITH, Jr.
President

EDUCATION

Bachelor of Science, Engineering and Applied Science, Yale University, 1967
Master of Science, Transportation Planning, University of California, Berkeley, 1968

PROFESSIONAL REGISTRATION

California No. 21913 (Civil) Nevada No. 7969 (Civil) Washington No. 29337 (Civil)
California No. 938 (Traffic) Arizona No. 22131 (Civil)

PROFESSIONAL EXPERIENCE

Smith Engineering & Management, 1993 to present. President.
DKS Associates, 1979 to 1993. Founder, Vice President, Principal Transportation Engineer.
De Leuw, Cather & Company, 1968 to 1979. Senior Transportation Planner.
Personal specialties and project experience include:

Litigation Consulting. Provides consultation, investigations and expert witness testimony in highway design, transit design and traffic engineering matters including condemnations involving transportation access issues; traffic accidents involving highway design or traffic engineering factors; land use and development matters involving access and transportation impacts; parking and other traffic and transportation matters.

Urban Corridor Studies/Alternatives Analysis. Principal-in-charge for State Route (SR) 102 Feasibility Study, a 35-mile freeway alignment study north of Sacramento. Consultant on I-280 Interstate Transfer Concept Program, San Francisco, an AA/EIS for completion of I-280, demolition of Embarcadero freeway, substitute light rail and commuter rail projects. Principal-in-charge, SR 238 corridor freeway/expressway design/environmental study, Hayward (Calif.) Project manager, Sacramento Northeast Area multi-modal transportation corridor study. Transportation planner for I-80N West Terminal Study, and Harbor Drive Traffic Study, Portland, Oregon. Project manager for design of surface segment of Woodward Corridor LRT, Detroit, Michigan. Directed staff on I-80 National Strategic Corridor Study (Sacramento-San Francisco), US 101-Sonoma freeway operations study, SR 92 freeway operations study, I-880 freeway operations study, SR 152 alignment studies, Sacramento RTD light rail systems study, Tasman Corridor LRT AA/EIS, Fremont-Warm Springs BART extension plan/EIR, SRs 70/99 freeway alternatives study, and Richmond Parkway (SR 93) design study.

Area Transportation Plans. Principal-in charge for transportation element of City of Los Angeles General Plan Framework, shaping nations largest city two decades into 21'st century. Project manager for the transportation element of 300-acre Mission Bay development in downtown San Francisco. Mission Bay involves 7 million gsf office/commercial space, 8,500 dwelling units, and community facilities. Transportation features include relocation of commuter rail station; extension of MUNI-Metro LRT; a multi-modal terminal for LRT, commuter rail and local bus; removal of a quarter mile elevated freeway; replacement by new ramps and a boulevard; an internal roadway network overcoming constraints imposed by an internal tidal basin; freeway structures and rail facilities; and concept plans for 20,000 structured parking spaces. Principal-in-charge for circulation plan to accommodate 9 million gsf of office/commercial growth in downtown Bellevue (Wash.). Principal-in-charge for 64 acre, 2 million gsf multi-use complex for FMC adjacent to San Jose International Airport. Project manager for transportation element of Sacramento Capitol Area Plan for the state governmental complex, and for Downtown Sacramento Redevelopment Plan. Project manager for Napa (Calif.) General Plan Circulation Element and Downtown Riverfront Redevelopment Plan, on parking program for downtown Walnut Creek, on downtown transportation plan for San Mateo and redevelopment plan for downtown Mountain View (Calif.), for traffic circulation and safety plans for California cities of Davis, Pleasant Hill and Hayward, and for Salem, Oregon.

Transportation Centers. Project manager for Daly City Intermodal Study which developed a $7 million surface bus terminal, traffic access, parking and pedestrian circulation improvements at the Daly City BART station plus development of functional plans for a new BART station at Colma. Project manager for design of multi-modal terminal (commuter rail, light rail, bus) at Mission Bay, San Francisco. In Santa Clarita Long Range Transit Development Program, responsible for plan to relocate system's existing timed-transfer hub and development of three satellite transfer hubs. Performed airport ground transportation system evaluations for San Francisco International, Oakland International, Sea-Tac International, Oakland International, Los Angeles International, and San Diego Lindberg.

Campus Transportation. Campus transportation planning assignments for UC Davis, UC Berkeley, UC Santa Cruz and UC San Francisco Medical Center campuses; San Francisco State University; University of San Francisco; and the University of Alaska and others. Also developed master plans for institutional campuses including medical centers, headquarters complexes and research & development facilities.

Special Event Facilities. Evaluations and design studies for football/baseball stadiums, indoor sports arenas, horse and motor racing facilities, theme parks, fairgrounds and convention centers, ski complexes and destination resorts throughout western United States.

Parking. Parking programs and facilities for large area plans and individual sites including downtowns, special event facilities, university and institutional campuses and other large site developments; numerous parking feasibility and operations studies for parking structures and surface facilities; also, resident preferential parking .

Transportation System Management & Traffic Restraint. Project manager on FHWA program to develop techniques and guidelines for neighborhood street traffic limitation. Project manager for Berkeley, (Calif.), Neighborhood Traffic Study, pioneered application of traffic restraint techniques in the U.S. Developed residential traffic plans for Menlo Park, Santa Monica, Santa Cruz, Mill Valley, Oakland, Palo Alto, Piedmont, San Mateo County, Pasadena, Santa Ana and others. Participated in development of photo/radar speed enforcement device and experimented with speed humps. Co-author of Institute of Transportation Engineers reference publication on neighborhood traffic control.

Bicycle Facilities. Project manager to develop an FHWA manual for bicycle facility design and planning, on bikeway plans for Del Mar, (Calif.), the UC Davis and the City of Davis. Consultant to bikeway plans for Eugene, Oregon, Washington, D.C., Buffalo, New York, and Skokie, Illinois. Consultant to U.S. Bureau of Reclamation for development of hydraulically efficient, bicycle safe drainage inlets. Consultant on FHWA research on effective retrofits of undercrossing and overcrossing structures for bicyclists, pedestrians, and handicapped.

MEMBERSHIPS

Institute of Transportation Engineers Transportation Research Board

PUBLICATIONS AND AWARDS

Residential Street Design and Traffic Control, with W. Homburger *et al.* Prentice Hall, 1989.

Co-recipient, Progressive Architecture Citation, *Mission Bay Master Plan*, with I.M. Pei WRT Associated, 1984.

Residential Traffic Management, State of the Art Report, U.S. Department of Transportation, 1979.

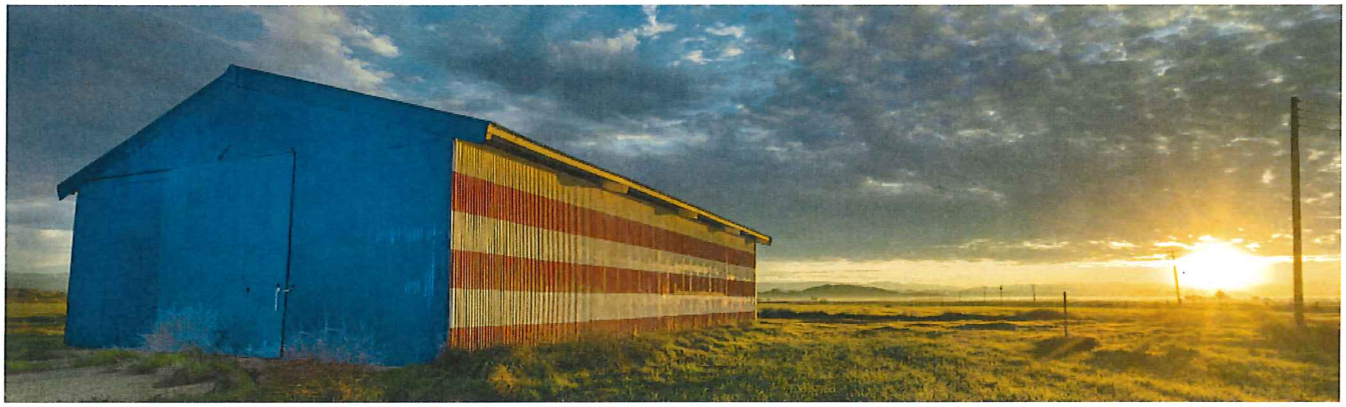
Improving The Residential Street Environment, with Donald Appleyard et al., U.S. Department of Transportation, 1979.

Strategic Concepts in Residential Neighborhood Traffic Control, International Symposium on Traffic Control Systems, Berkeley, California, 1979.

Planning and Design of Bicycle Facilities: Pitfalls and New Directions, Transportation Research Board, Research Record 570, 1976.

Co-recipient, Progressive Architecture Award, *Livable Urban Streets, San Francisco Bay Area and London*, with Donald Appleyard, 1979.

Attachment C



Home > Blog > A New Vision for the Flag Barn

A New Vision for the Flag Barn

Posted: March, 20, 2017 | Categories: Experience McCaffrey | Lifestyle

20

Many of you are familiar with our flag barn, which has become somewhat of an icon to those of us who live here. We painted it in stars and stripes in the days after 9/11 to express our love of country during a difficult time. This land surrounding the barn is profoundly meaningful to us, and has always held the promise of becoming something great.

For generations, our family has been deeply involved in Madera and Fresno Counties. We are committed to strengthening the communities we build in with a single, overriding goal: to build strong communities for better lives. That's why we're thrilled that Community Medical Centers (CMC) has purchased our 200-acre flag barn property at the northeast corner of Highway 41 and Avenue 12.

In keeping with its tradition of long-term, visionary planning, CMC plans to build an eventual facility to meet the region's future healthcare needs in this prime development corridor of Madera County's Rio Mesa Area Plan. This area is also where the new Riverstone community is situated and where our upcoming new master planned community of Tesoro Viejo will be.

CMC's presence there will be an enormous asset to the residents of Madera County, and we're extremely pleased that we could be a part of this important step for their organization. We couldn't have asked for better owners, who are just as proud as we were to hold such a landmark property. As we bid a fond farewell to our beloved flag barn property, we do so with hope – knowing that the future of this land will be a great benefit to the surrounding communities for generations to come.

Madera County Board of Supervisors, Community Medical Centers leaders, and the McCaffrey family celebrate the announcement of Community Medical Center's purchase of the flag barn property.

MyChart For Healthcare Professionals Careers Community Care Health Plan Donate Español Subm

THE COMMUNITY MEDICAL CENTERS HEALTHCARE NETWORK - CENTRAL CALIFORNIA

OUR SERVICES FIND A PHYSICIAN FOR PATIENTS & FAMILIES COMMUNITY INVOLVEMENT HOSPITALS & FACILITIES ABOUT US

FIND A **PHYSICIAN**

MAPS & PARKING

MAKE A **GIFT**

Community Regional Medical Center

Located in downtown Fresno, Community Regional Medical Center is the flagship hospital of Community Medical Centers. Accredited and recognized for quality care by The Joint Commission in 2014, we are home to central California's highest level of care with a capacity of 685 licensed beds.

Our one-of-a-kind Central California Neuroscience Institute brings together clinical experts in brain tumors, stroke, dementia, Parkinson's disease, Alzheimer's disease and more. We were the first hospital in the world to offer Generation 4 CyberKnife technology to treat cancer.

As a leader in comprehensive cardiovascular services Community Regional offers more

Community Regional Medical Center

- **Maps & Parking**
- **Services at Community Regional**
- **For Visitors**
- **Careers at Community Regional**
- **News**
- **Contact Community Regional**

advanced cardiac treatment options than any other hospital in the Valley. We perform about 3,600 cardiovascular procedures a year and partner with the UCSF Fresno Medical Education Program to offer the only cardiology, pulmonary and interventional cardiac fellowship training programs in the region.

We are one of the busiest birthing centers in California with the largest Level 3 neonatal intensive care unit in the Valley. Our combined expertise in both adult and newborn medicine makes our hospital the only one in the area where recovering mothers and their critically ill babies can stay together for the treatments they need.

Our full-service 58,000-square-foot Emergency Department is home to the Table Mountain Rancheria Trauma Center and Leon S. Peters Burn Center – the region's only Level 1 (highest level) trauma and comprehensive burn center. Our affiliation with the University of California San Francisco Medical School – one of the top medical schools in the nation – provides patients access to some of the brightest and most forward-thinking medical specialists in the country.

Recognizing the role family plays in recovery, Community Regional established Terry's House, a 17,000-square-foot home established to provide a supportive residence for families while their loved ones receive critical care in the hospital. This home is conveniently located across from our main building so patients' families are able to stay close and connected to loved ones who are in our care.

FACTS & REPORTS

CAREER **OPPORTUNITIES**

BILLING INFO

Site Map Privacy & HIPAA Contact Us Disclaimer

APPENDIX B

2019 Notice of Preparation and Public/Agency Comment Letters

Notice of Preparation

To: **All Interested Parties**

Subject: **Notice of Preparation of a Draft Environmental Impact Report for the Rio Mesa Boulevard Project (SCH# 2017101048)**

Date: **October 23, 2019**

Lead Agency Name and Address:	**Contact Person and Phone Number:**
Madera County 200 W. 4th St. Suite 3100 Madera, CA 93637	Matthew Treber, Planning Director (559) 675-7821

Madera County will be the Lead Agency pursuant to the California Environmental Quality Act (CEQA) and will prepare an Environmental Impact Report (EIR) for the Rio Mesa Boulevard Project. The County Community and Economic Development Department, Planning Division, will prepare the EIR and is requesting information as to the scope and content of the environmental information to be included in the EIR from any interested parties. If you are an agency with statutory responsibilities in connection with the proposed project, your agency will need to use the EIR prepared by Madera County when considering your permit or other approval for the project. An Draft EIR scoping meeting will be conducted to receive public and agency input on the scope of environmental issues to address in the EIR. The scoping meeting will be held on November 13, 2019, at 4:00 PM at the Madera County Government Center 200 W 4th Street, Madera, Third Floor Hearing Room.

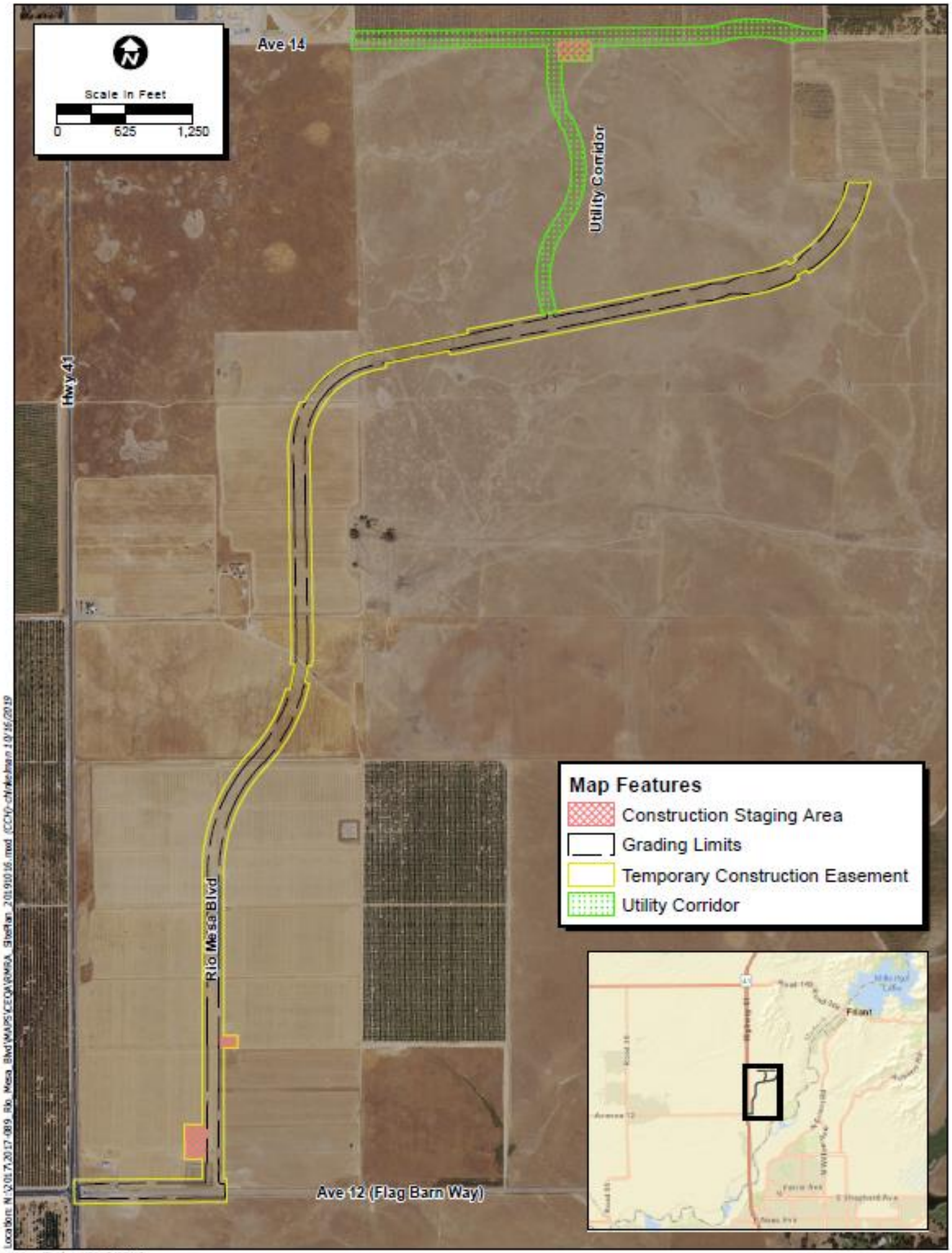
Due to the time limits mandated by State law, your response to this NOP must be sent at the earliest possible date ***but not later than 30 days*** after receipt of this NOP. The response deadline is **November 22, 2019**. Please send your response to Jamie Bax, Deputy Director at the address shown above or via email at jamie.bax@maderacounty.com.

Project Title:	**Project Location:**
Rio Mesa Boulevard	Unincorporated Madera County, east of State Route 41, between Avenue 12 and Avenue 14, as shown on the attached figure.

Project Description: The proposed project would construct a 2.6-mile segment of new road providing a connection between Avenue 12 in the south to a planned segment of Rio Mesa Boulevard within the Tesoro Viejo community to the north. The proposed roadway would include two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks. The project would also install storm drainage collection and conveyance facilities, water and wastewater conveyance infrastructure, and conduit and pipeline for dry utilities (i.e., electric, telephone, cable, fiber, and/or natural gas).

Within areas that are known as California tiger salamander (CTS) migration corridors, the roadway design includes a 6-inch raised concrete curb at the back of the sidewalk to restrict CTS access to the road and includes a series of box culverts under the road that will allow CTS and other wildlife to safely pass under the roadway and maintain their existing dispersal patterns.

The County circulated a Draft Initial Study / Mitigated Negative Declaration (IS/MND) for the proposed project in October 2017. Based on the comments received on the IS/MND, the County determined that an EIR would be prepared for the project. The EIR will evaluate environmental resource issues as outlined in Appendix G of the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et sec., as amended December 28, 2018).



Location: N:\2017\2017-089 Rio_Mesa_Blvd\MAPS\CEQA\RMSA_Steffan_20191016.mxd (CCH)-chinkelman 10/16/2019

Map Date: 10/16/2019
Photo Source: NAIP (2018)
Service Layer Credits: Copyright: ©2015 DeLorme

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Exhibit A. Site Plan

2017-089 Rio Mesa Boulevard Road Alignment

B1: California Department of Transportation Comment Letter

B2: Department of Toxic Substances Control Comment Letter

B3: Native American Heritage Commission Comment Letter

B4: U.S. Army Corps of Engineers Comment Letter

B5: U.S. Fish and Wildlife Service Comment Letter

STATE OF CALIFORNIA—CALIFORNIASTATE TRANSPORTATION AGENCY Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 6
1352 WEST OLIVE AVENUE
P.O. BOX 12616
FRESNO, CA 93778-2616
PHONE (559) 444-2493
FAX (559) 445-5875
TTY 711
www.dot.ca.gov

Making Conservation
a California Way of Life.

November 19, 2019

06-MAD-41-3.232
Rio Mesa Boulevard
Notice of Preparation
SCH # 2017101048

SENT VIAL EMAIL

Ms. Jamie Bax, Deputy Director
Madera County
200 W. 4th Street
Madera, California 93637

Dear Ms. Bax:

Thank you for including Caltrans in the environmental review process for the project referenced above. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

We provide these comments consistent with the State's smart mobility goals that support a vibrant economy and build communities. The following comments are based on the Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the Rio Mesa Boulevard Project dated October 23, 2019 to allow for the construction of the following:

The County of Madera is proposing to construct a 2.6-mile segment of new road providing a connection between Avenue 12 to the south to a planned segment of Rio Mesa Boulevard within the Tesoro Viejo community to the north. The proposed roadway would include two northbound and two southbound travel lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks. The County of Madera circulated a Draft Initial Study/Mitigated Negative Declaration for the proposed Project in October 2017. It was then determined that an EIR would be prepared for the proposed Project in compliance with CEQA requirements. An intersection of Avenue 12 and Rio Mesa Boulevard would initially be formed as a 3-legged intersection at the Project Phase I, and ultimately would form a 4-legged intersection. Caltrans has the following comments:

- Caltrans previously provided a comment letter dated November 15, 2017. The study should include an operational analysis of the future SR 41/Avenue 12interchange. A Caltrans Project Study Report to construct a new interchange for SR 41/Avenue 12 was completed in June 2008. The project would construct a partial cloverleaf interchange.
- The proposed Rio Mesa Boulevard connecting to Avenue 12 is located at approximately 1,300 feet from the existing intersection of State Route (SR) 41 and Avenue 12. The future plan is to convert the existing intersection to an interchange. The 1,300-foot spacing would not provide enough separation between the future SR 41 northbound off/on ramps to the proposed Rio Mesa Boulevard. Therefore, the intersection of Avenue 12 and Rio Mesa Boulevard should be relocated at a minimum of 0.25 mile from the future interchange footprint. The distance may be increased if the Draft EIR determines that greater intersection spacing is needed due to the increased of traffic volumes, impacts due to queuing, or to maintain traffic signal timing efficiency.

- A future cumulative buildout traffic scenario should be studied. This should include the buildout of the Rio Mesa Area Plan, the future development on the southeast quadrant, and the proposed Community Hospital located on the northeast quadrant of the SR 41 and Avenue 12 intersection. Access to the future hospital should also be studied. The study should also include the future extension of Rio Mesa Boulevard to the south at Children Boulevard. The Rio Mesa Boulevard extension to the south would form an ultimate 4-legged intersection with Avenue 12.
- Caltrans request an opportunity to comment on the scope of work prior to the preparation of the traffic impact study.

If you have any further questions, please contact me at (559) 444-2493.

Sincerely,

DAVID PADILLA
Associate Transporation Planner
Division of Transportation Planning

c: Michael Navarro, Chief, Planning North Branch, Caltrans

Department of Toxic Substances Control

Jared Blumenfeld
Secretary for
Environmental Protection

Meredith Williams, Ph.D.
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Gavin Newsom
Governor

November 18, 2019

Ms. Jamie Bax
Madera County
200 W. 4th Street
Madera, California 93637

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR RIO MESA BLVD PROJECT – DATED OCTOBER 23, 2019 (STATE CLEARINGHOUSE NUMBER: 2017101048)

Dear Ms. Bax:

The Department of Toxic Substances Control (DTSC) received a Notice of Preparation (NOP) for an Environmental Impact Report (EIR) for the Rio Mesa Boulevard Project.

The proposed project would construct a 2.6-mile segment of new road providing a connection between Avenue 12 in the south to a planned segment of Rio Mesa Boulevard within the Tesoro Viejo community to the north. The proposed roadway would include two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks. The project would also install storm drainage collection and conveyance facilities, water and wastewater conveyance infrastructure, and conduit and pipeline for dry utilities that include electric, telephone, cable, fiber, and/or natural gas.

DTSC recommends that the following issues be evaluated in the EIR, Hazards and Hazardous Materials section:

1. The forthcoming EIR should acknowledge the potential for project site activities to have resulted in the release of hazardous wastes/substances. In instances in which releases have occurred, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. The EIR should also identify the mechanism(s) to initiate any required investigation and/or remediation and

the government agency who will be responsible for providing appropriate regulatory oversight.

2. If buildings or other structures are to be demolished on any project sites included in the proposed project, surveys should be conducted for the presence of lead-based paints or products, mercury, asbestos containing materials, and polychlorinated biphenyl caulk. Removal, demolition and disposal of any of the above-mentioned chemicals should be conducted in compliance with California environmental regulations and policies. In addition, sampling near current and/or former buildings should be conducted in accordance with DTSC's 2006 *Interim Guidance Evaluation of School Sites with Potential Contamination from Lead Based Paint, Termiticides, and Electrical Transformers* (https://dtsc.ca.gov/wpcontent/uploads/sites/31/2018/09/Guidance_Lead_Contamination_050118.pdf).

3. If any projects initiated as part of the proposed project require the importation of soil to backfill any excavated areas, proper sampling should be conducted to ensure that the imported soil is free of contamination. DTSC recommends the imported materials be characterized according to *DTSC's 2001 Information Advisory Clean Imported Fill Material* (https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/09/SMP_FS_Cleanfill-Schools.pdf).

4. If any sites included as part of the proposed project have been used for agricultural, weed abatement or related activities, proper investigation for organochlorinated pesticides should be discussed in the EIR. DTSC recommends the current and former agricultural lands be evaluated in accordance with DTSC's 2008 *Interim Guidance for Sampling Agricultural Properties (Third Revision)* (https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/09/Ag-Guidance-Rev-3-August-7-2008-2.pdf).

DTSC appreciates the opportunity to review the NOP. Should you need any assistance with an environmental investigation, please submit a request for Lead Agency Oversight Application, which can be found at: https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/09/VCP_App-1460.doc. Additional information regarding voluntary agreements with DTSC can be found at: https://dtsc.ca.gov/brownfields/.

If you have any questions, please contact me at (916) 255-3710 or via email at Gavin.McCreary@dtsc.ca.gov.

Sincerely,

Gavin McCreary

Gavin McCreary
Project Manager
Site Evaluation and Remediation Unit
Site Mitigation and Restoration Program
Department of Toxic Substances Control

cc: (via email)

Governor's Office of Planning and Research
State Clearinghouse
State.clearinghouse@opr.ca.gov

Ms. Lora Jameson, Chief
Site Evaluation and Remediation Unit
Department of Toxic Substances Control
Lora.Jameson@dtsc.ca.gov

Mr. Dave Kereazis
Office of Planning & Environmental Analysis
Department of Toxic Substances Control
Dave.Kereasis@dtsc.ca.gov

STATE OF CALIFORNIA GAVIN NEWSOM, Governor

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

RECEIVED
NOV 06 2019
MADERA COUNTY
PLANNING DEPARTMENT

November 1, 2019

Jamie Bax
Madera County
200 W. 4th Street
Madera, CA 93637

RE: SCH# 2017101048, Rio Mesa Blvd Project, Madera County

Dear Ms. Bax:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
   - **a.** A brief description of the project.
   - **b.** The lead agency contact information.
   - **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
   - **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
   - **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   - **a.** Alternatives to the project.
   - **b.** Recommended mitigation measures.
   - **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   - **a.** Type of environmental review necessary.
   - **b.** Significance of the tribal cultural resources.
   - **c.** Significance of the project's impacts on tribal cultural resources.
   - **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   - **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
   - **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    - **a.** The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    - **b.** A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    - **a.** Avoidance and preservation of the resources in place, including, but not limited to:
        - **i.** Planning and construction to avoid the resources and protect the cultural and natural context.
        - **ii.** Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    - **b.** Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        - **i.** Protecting the cultural character and integrity of the resource.
        - **ii.** Protecting the traditional use of the resource.
        - **iii.** Protecting the confidentiality of the resource.
    - **c.** Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    - **d.** Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    - **e.** Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    - **f.** Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    - **a.** The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    - **b.** The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    - **c.** The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    - **a.** A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    - **b.** A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    - **a.** Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    - **b.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    - **c.** Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

cc: State Clearinghouse

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

November 7, 2019

Regulatory Division (SPK-2019-00804)

Ms. Jamie Bax
Madera County
200 W. 4th Street, Suite 3100
Madera, California 93637
(Jamie.bax@maderacounty.com)

Dear Ms. Bax:

We are responding to your October 23, 2019, request for comments on the Rio Mesa Boulevard project. Your identification number is SCH# 2017101048 for this project. This 2.6-mile roadway project is proposing to connect Avenue 12 to the proposed northern development of Tesoro Viejo. This project site is located near Root Creek in a vernal pool landscape in Sections 28 and 33, Township 11 South, Range 20 East, MDB&M, Latitude 36.93339°, Longitude -119.78524°, Madera County, California.

The Corps of Engineers' jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, marshes, wet meadows, some canals, and seeps. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.

To ascertain the extent of waters on the project site, the applicant should prepare a wetland delineation, in accordance with the "Minimum Standards for Acceptance of Preliminary Wetlands Delineations" and “Final Map and Drawing Standards for the South Pacific Division Regulatory Program” under "Jurisdiction" on our website at the address below, and submit it to this office for verification. A list of consultants that prepare wetland delineations and permit application documents is also available on our website at the same location.

The range of alternatives considered for this project should include alternatives that avoid impacts to wetlands or other waters of the United States. Every effort should be made to avoid project features which require the discharge of dredged or fill material into waters of the United States. In the event it can be clearly demonstrated there are no practicable alternatives to filling waters of the United States, mitigation plans should be developed to compensate for the unavoidable losses resulting from project implementation.

If waters of the United States are going to be impacted, cultural resource sites within the defined federal permit area, will need to be evaluated according to the standards of the National Environmental Policy Act. All eligible or potentially eligible cultural resource sites in the permit area will be subject to Section 106 of the National Historic Preservation Act, 1966, as amended. The Corps of Engineers must also comply with the terms and conditions of the Federal Endangered Species Act with regards to our permitting process.

Please refer to identification number SPK-2019-00804 in any correspondence concerning this project. If you have any questions, please contact me at the letterhead address, Room 1350, by email at *Kathy.Norton@usace.army.mil*, or telephone at (916) 557-5260. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx.*

Sincerely,

Kathy Norton
Sr. Project Manager
California South Section

cc:

Mr. Craig Bailey, California Department of Fish and Wildlife, 1234 E Shaw Avenue, Fresno, California 93710 (Craig.Bailey@wildlife.ca.gov)
Ms. Patricia Cole, U.S. Fish and Wildlife Service, San Joaquin Valley Division, 2800 Cottage Way, Sacramento, California 95825 (patricia_cole@fws.gov)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

NOV 22 2019

In Reply Refer to:
08ESMF00-2020-TA-0404

Matthew Treber
Planning Director, Madera County
200 W. 4th Street, Suite 3100
Madera, California 93637

Subject: Rio Mesa Boulevard (SCH#2017101048)

Dear Mr. Treber:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Rio Mesa Boulevard Project (SCH# 2017101048) (Project) received October 30, 2019 regarding the proposal to construct a 2.6 mile segment of new road providing a connection between Avenue 12 in the south to a planned segment of Rio Mesa Boulevard within the Tesoro Viejo community to the north. The project location is in unincorporated Madera County, east of State Route 41, between Avenue 12 and Avenue 14. This response is pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

According to the Project description, the 2.6-mile segment of road would include two northbound and two southbound asphalt lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks. The Project would also install storm drainage collection and conveyance facilities, water and wastewater conveyance infrastructure, and conduit and pipeline for dry utilities (i.e., electric, telephone, cable, fiber, and/or natural gas). Within areas that are known as California tiger salamander (CTS) migration corridors, the roadway design includes a 6-inch raised concrete curb at the back of the sidewalk to restrict CTS access to the road and includes a series of box culverts under the road that will allow CTS and other wildlife to safely pass under the roadway and maintain their existing dispersal patterns. The following federally-listed species have been documented on or near the proposed Project area: California Tiger Salamander (*Ambystoma californiense*, Threatened), Vernal Pool Fairy Shrimp (*Branchinecta lynchi*, Threatened), Fleshy Owl's-clover (*Castilleja campestris* ssp. *succulent*, Threatened), Hairy Orcutt Grass (*Orcuttia pilosa*, Endangered), San Joaquin Orcutt Grass (*Orcuttia inaequalis*, Threatened). In addition, the Project site is located within California tiger salamander, Fleshy Owl's-clover, Hairy Orcutt Grass, and San Joaquin Orcutt Grass Critical Habitat.

The Service recommends that the County conduct a thorough habitat assessment to determine the current presence and extent of suitable habitat within the Project site for any listed species. According to the California Natural Diversity Database there are recorded sightings of Vernal Pool Fairy Shrimp, Fleshy Owl's-clover, and San Joaquin Orcutt Grass from as current as 2017. These species are dependent upon the existing hydrological conditions, which could be altered with a road and culverts. With that, the Service recommends that the County consult IPaC (http://ecos.few.gov/ipac/) to obtain a full list of any federally listed species that may occur on or near the Project site. If any listed species may occur on or near the Project site, we recommend that you contact the Service to determine whether any further coordination is needed through Section 7 of the Act if a federal nexus exists or Section 10 of the Act if there is no federal nexus.

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Thank you for the opportunity to review this Project. If you have questions regarding this response, please contact Maggie Sepulveda (margaret_sepulveda@fws.gov) or me (patricia_cole @fws.gov), at the letterhead address or at (916) 414-6512 or (916) 414-6544.

Sincerely,

Patricia Cole

Patricia Cole
Chief, San Joaquin Valley Division

cc:
Julie Vance, California Department of Fish and Wildlife, Fresno, CA

APPENDIX C

Project Construction Sequencing Description

Rio Mesa Boulevard Project – Phase 1
Construction Sequence and Durations

The construction duration for Phase 1 of the Rio Mesa Boulevard Project is anticipated to take approximately one (1) year. However, the installation of some or all utilities within the Rio Mesa Boulevard right-of-way and the linked utility corridors may occur later than the roadway construction by up to one to two years. The attached preliminary project schedule is broken down by individual roadway segments and further broken down by individual types of operations. In general, the sequence for the construction of the proposed project is a progression of: Clearing, followed by grade preparation, followed by rough excavation (grading), followed by wet utility (sewer, storm drain, water and recycled water) installation (starting with the deepest utility first and progressing to the shallowest), followed by dry utility installation (electrical, gas, cable TV and telephone), followed by street lights, followed by subgrade preparation (lime treated subgrade), followed by placement of aggregate base, followed by placement of asphalt curbs (where applicable for California tiger salamander protection) and finally followed by placement of asphalt, striping and signage. The following are the anticipated construction sequence and types of equipment, and estimated durations, broken down by roadway segments (however comparable steps for each segment would occur at approximately the same time in parallel):

For Avenue 14 Utility Corridor Segment:

- Clearing: Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:
- Cat 623 scraper
- Cat 163 motor grader
- Challenger tractor with disc
- Two (2) 3,500 gallon water trucks

- OG Preparation (grade preparation): Duration is anticipated to take 2 working days. Equipment is anticipated to involve the following:
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
  - Cat 815 compactor

- Rough Excavation: Duration is anticipated to take 2 working days. Equipment is anticipated to involve the following:
  - Two (2) Cat 637 scrapers
  - Cat 815 compactor
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks

- Sewer System: Duration is anticipated to take 17 working days. Equipment is anticipated to involve the following:
  - Komatsu 400 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - Cat pactor
  - 3,500 gallon water truck
  - Approximately 305 trucks loads of materials (pipe, manhole material and pipe bedding and backfill)

- Drain System: Duration is anticipated to take approximately 12 working days. Equipment is anticipated to involve the following:
  - Komatsu 400 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - Cat pactor
  - 3,500 gallon water truck
  - Approximately 40 trucks loads of materials (pipe, concrete and pipe bedding and backfill)
- Recycled Water System: Duration is anticipated to take approximately 18 working days. Equipment is anticipated to involve the following:
  - Komatsu 300 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - John Deere 510 whirley
  - 3,500 gallon water truck
  - Approximately 75 trucks loads of materials (pipe, fittings and pipe bedding and backfill)
- Water System: Duration is anticipated to take approximately 18 working days. Equipment is anticipated to involve the following:
  - Komatsu 300 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - John Deere 510 whirley
  - 3,500 gallon water truck
  - Approximately 75 trucks loads of materials (pipe, fittings and pipe bedding and backfill)
- Aggregate Base Access Road: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 615 scraper
  - Cat vibratory roller
  - 3,500 gallon water truck
  - Approximately 80 trucks loads of material (aggregate base)
- Electrical System, Landscape Improvements nor Misc. Improvements are not included for this segment.

For Rio Mesa Blvd Segment:

- Clearing: Duration is anticipated to take 10 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks

- OG Preparation (grade preparation): Duration is anticipated to take 15 working days. Equipment is anticipated to involve the following:
    - Challenger tractor with disc
    - Two (2) 3,500 gallon water trucks
    - Cat 815 compactor
- Rough Excavation: Duration is anticipated to take 10 working days. Equipment is anticipated to involve the following:
    - Four (4) Cat 637 scrapers
    - Cat 815 compactor
    - Cat 163 motor grader
    - Challenger tractor with disc
    - Four (4) 3,500 gallon water trucks
- Drain System: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
    - Komatsu 400 excavator
    - Two (2) Komatsu 220 excavators
    - Komatsu 150 loader
    - Cat pactor
    - 3,500 gallon water truck
    - Approximately 465 trucks loads of materials (pipe, concrete and pipe bedding and backfill)
- Bridge Structures: Duration is anticipated to take 90 working days. Equipment is anticipated to involve the following:
    - Forklift
    - Hydralift
    - Concrete pump truck
    - Komatsu 220 excavator
    - Komatsu 150 loader
    - Approximately 70 truck loads of material (formwork, reinforcement, concrete, backfill)
- Sewer System: Duration is anticipated to take 25 working days. Equipment is anticipated to involve the following:
    - Komatsu 400 excavator
    - Two (2) Komatsu 220 excavators
    - Komatsu 150 loader
    - Cat pactor
    - 3,500 gallon water truck
    - Approximately 165 trucks loads of materials (pipe, manhole material and pipe bedding and backfill)
- Recycled Water System: Duration is anticipated to take approximately 30 working days. Equipment is anticipated to involve the following:
    - Komatsu 300 excavator
    - Two (2) Komatsu 220 excavator
    - Komatsu 150 loader
    - John Deere 510 whirley

  - 3,500 gallon water truck
  - Approximately 275 trucks loads of materials (pipe, fittings and pipe bedding and backfill)

- Water System: Duration is anticipated to take approximately 45 working days. Equipment is anticipated to involve the following:
  - Komatsu 300 excavator
  - Two (2) Komatsu 220 excavators
  - Komatsu 150 loader
  - John Deere 510 whirley
  - 3,500 gallon water truck
  - Approximately 275 trucks loads of materials (pipe, fittings and pipe bedding and backfill)

- Dry Utility System: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - 3,500 gallon water truck
  - Approximately 65 trucks loads of materials (conduit, gas pipe and fittings, conductor, cabling, vaults, boxes, electrical components and bedding and backfill)

- Street Light System: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
  - Case 580 backhoe
  - Case ditch witch
  - Approximately 12 truck loads of material (lights, poles, conduit, wire and concrete)

- Lime Treated Subgrade: Duration is anticipated to take approximately 15 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 623 scraper
  - Two (2) Cat vibratory rollers
  - Three (3) 3,500 gallon water trucks
  - Roto-Tiller Lime Mixer
  - Two Cat pactors
  - Approximately 60 trucks loads of material (lime)

- Aggregate Base Roadway Section: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 623 scraper
  - Two (2) Cat vibratory rollers
  - Two (2) 3,500 gallon water trucks
  - Approximately 1,250 truck loads of material (aggregate base)

- Raised Median Curbs: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
  - John Deere 210 tractor
  - Power Curb machine

  - Approximately 25 truck loads of material (concrete)

- Asphalt Paving Roadway Section: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
  - Cat paver
  - Three (3) Cat vibratory rollers
  - Approximately 625 truck loads of material (asphalt)
- Striping and Signage: Duration is anticipated to take approximately 15 working days. Equipment is anticipated to involve the following:
  - Power broom
  - Striping truck
  - Bobcat with auger
  - Approximately 4 truck loads of material (paint, thermoplastic, posts and signs)
- Landscape Improvements are not included for this segment during Phase 1.

For North-South Utility Corridor Segment:

- Clearing: Duration is anticipated to take 2 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
- OG Preparation (grade preparation): Duration is anticipated to take 2 working days. Equipment is anticipated to involve the following:
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
  - Cat 815 compactor
- Rough Excavation: Duration is anticipated to take 2 working days. Equipment is anticipated to involve the following:
  - Two (2) Cat 637 scrapers
  - Cat 815 compactor
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
- Sewer System: Duration is anticipated to take 15 working days. Equipment is anticipated to involve the following:
  - Komatsu 400 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - Cat pactor
  - 3,500 gallon water truck
  - Approximately 305 trucks loads of materials (pipe, manhole material and pipe bedding and backfill)

- Drain System: Duration is anticipated to take approximately 20 working days. Equipment is anticipated to involve the following:
  - Forklift
  - Hydralift
  - Concrete pump truck
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - Approximately 25 truck loads of material (formwork, reinforcement, concrete, backfill)
- Recycled Water System: Duration is anticipated to take approximately 12 working days. Equipment is anticipated to involve the following:
  - Komatsu 300 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - John Deere 510 whirley
  - 3,500 gallon water truck
  - Approximately 30 trucks loads of materials (pipe, fittings and pipe bedding and backfill)
- Water System: Duration is anticipated to take approximately 13 working days. Equipment is anticipated to involve the following:
  - Komatsu 300 excavator
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - John Deere 510 whirley
  - 3,500 gallon water truck
  - Approximately 30 trucks loads of materials (pipe, fittings and pipe bedding and backfill)
- Aggregate Base Access Road: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 615 scraper
  - Cat vibratory roller
  - 3,500 gallon water truck
  - Approximately 170 trucks loads of material (aggregate base)
- Electrical System, Landscape Improvements nor Misc. Improvements are not included for this segment.

For Avenue 12 Segment:

- Clearing: Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
- OG Preparation (grade preparation): Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:

  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks
  - Cat 815 compactor

- Rough Excavation: Duration is anticipated to take 3 working days. Equipment is anticipated to involve the following:
  - Two (2) Cat 637 scrapers
  - Cat 815 compactor
  - Cat 163 motor grader
  - Challenger tractor with disc
  - Two (2) 3,500 gallon water trucks

- Drain System: Duration is anticipated to take approximately 40 working days. Equipment is anticipated to involve the following:
  - Forklift
  - Hydralift
  - Concrete pump truck
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - Approximately 45 truck loads of material (formwork, reinforcement, concrete, backfill)

- Street Light System: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
  - Case 580 backhoe
  - Case ditch witch
  - Approximately 4 truck loads of material (lights, poles, conduit, wire and concrete)

- Lime Treated Subgrade: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 623 scraper
  - Two (2) Cat vibratory rollers
  - Three (3) 3,500 gallon water trucks
  - Roto-Tiller Lime Mixer
  - Two Cat pactors
  - Approximately 20 trucks loads of material (lime)

- Aggregate Base Roadway Section: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 623 scraper
  - Cat vibratory rollers
  - 3,500 gallon water trucks
  - Approximately 200 truck loads of material (aggregate base)

- Asphalt Paving Roadway Section: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat paver
  - Three (3) Cat vibratory rollers Cat 163 motor grader
  - Approximately 100 truck loads of material (asphalt)

- Striping and Signage: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Power broom
  - Striping truck
  - Bobcat with auger
  - Approximately 4 truck loads of material (paint, thermoplastic, posts and signs)
- Sewer System, Water System, and Recycled Water System improvements are not included for this segment. Landscape Improvements are not anticipated for this segment during Phase 1.

Dirt Balance:

- The earthwork for this project is anticipated at this time to balance and will not have a need for either import or export of dirt.

Rio Mesa Boulevard Project – Phase 2

Construction Sequence and Durations

The construction duration for Phase 2 of the Rio Mesa Boulevard Project is anticipated to take approximately nine (9) months. The attached preliminary project schedule is broken down by individual roadway segments and further broken down by individual types of operations. In general, the sequence for the construction of the proposed project is a progression of: Clearing, followed by grade preparation, followed by rough excavation (grading), followed by wet utility (storm drain and water where applicable) installation (starting with the deepest utility first and progressing to the shallowest), followed by dry utility installation (electric, gas, cable TV and telephone), followed by signalization, followed by subgrade preparation (lime treated subgrade), followed by concrete (curb & gutter, barrier curbs where applicable and sidewalks), followed by placement of aggregate base and finally followed by placement of asphalt paving, striping, signage and landscaping. The following are the anticipated construction sequence and types of equipment, and estimated durations, broken down by roadway segments (however comparable steps for each segment would occur at approximately the same time in parallel):

For Rio Mesa Blvd Segment:

- Clearing: Duration is anticipated to take 10 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks
- OG Preparation (grade preparation): Duration is anticipated to take 10 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks
  - Cat 815 compactor
- Rough Excavation: Duration is anticipated to take 10 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 815 compactor
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks

- Drain System: Duration is anticipated to take approximately 30 working days. Equipment is anticipated to involve the following:
    - Komatsu 220 excavator
    - Komatsu 150 loader
    - 3,500- gallon water truck
    - Approximately 40 trucks loads of materials (pipe, concrete and pipe bedding and backfill)
- Dry Utilities: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
    - Komatsu 220 excavator
    - Komatsu 150 loader
    - 3,500- gallon water truck
    - Approximately 65 truck loads of material (conduit, gas pipe and fittings, conductor, cabling, vaults, boxes, electrical components and bedding and backfill)
- Lime Treated Subgrade: Duration is anticipated to take approximately 15 working days. Equipment is anticipated to involve the following:
    - Cat 163 motor grader
    - Cat 623 scraper
    - Two (2) Cat vibratory rollers
    - Two (2) 3,500- gallon water trucks
    - Roto-Tiller Lime Mixer
    - Two Cat compactors
    - Approximately 60 trucks loads of material (lime)
- Aggregate Base Roadway Section: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
    - Cat 163 motor grader
    - Cat 623 scraper
    - Two (2) Cat vibratory rollers
    - Two (2) 3,500- gallon water trucks
    - Approximately 1,250 truck loads of material (aggregate base)
- Asphalt Paving Roadway Section: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
    - Cat paver
    - Three (3) Cat vibratory rollers
    - Approximately 625 truck loads of material (asphalt)
- Concrete Curbs, Gutters and Sidewalks: Duration is anticipated to take approximately 32 working days. Equipment is anticipated to involve the following:
    - Power curb machine
    - John Deere 210 tractor
    - Approximately 635 truck loads of material (concrete)
- Striping and Signage: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
    - Power broom

  - Striping truck
  - Bobcat with auger
  - Approximately 2 truck loads of material (paint, thermoplastic, posts and signs)

- Landscape & Irrigation: Duration is anticipated to take approximately 40 working days. Equipment is anticipated to involve the following:
  - Two (2) spade trucks
  - Case 580 backhoe
  - Two (2) Ditch Witch trenchers
  - Approximately 875 truck loads of material (trees, plants, bark, irrigation pipe, fittings and equipment)

For Avenue 12 Segment:

- Clearing: Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks
- OG Preparation (grade preparation): Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks
  - Cat 815 compactor
- Rough Excavation: Duration is anticipated to take 5 working days. Equipment is anticipated to involve the following:
  - Cat 623 scraper
  - Cat 815 compactor
  - Cat 163 motor grader
  - Two (2) 3,500- gallon water trucks
- Dry Utilities: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
  - Komatsu 220 excavator
  - Komatsu 150 loader
  - 3,500- gallon water truck
  - Approximately 30 truck loads of material (conduit, gas pipe and fittings, conductor, cabling, vaults, boxes, electrical components and bedding and backfill)
- Signal System: Duration is anticipated to take approximately 60 working days. Equipment is anticipated to involve the following:
  - Case 580 backhoe
  - Boom truck
  - Approximately 20 truck loads of material (lights, poles, conduit, wire, rebar and concrete)
- Lime Treated Subgrade: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader

  - Cat 623 scraper
  - Two (2) Cat vibratory rollers
  - Two (2) 3,500- gallon water trucks
  - Roto-Tiller Lime Mixer
  - Two Cat compactors
  - Approximately 20 trucks loads of material (lime)

- Concrete Curbs, Gutters and Sidewalks: Duration is anticipated to take approximately 10 working days. Equipment is anticipated to involve the following:
  - Power curb machine
  - John Deere 210 tractor
  - Approximately 50 truck loads of material (concrete)
- Aggregate Base Roadway Section: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat 163 motor grader
  - Cat 623 scraper
  - Cat vibratory rollers
  - 3,500- gallon water trucks
  - Approximately 200 truck loads of material (aggregate base)
- Asphalt Paving Roadway Section: Duration is anticipated to take approximately 5 working days. Equipment is anticipated to involve the following:
  - Cat paver
  - Three (3) Cat vibratory rollers
  - Approximately 100 truck loads of material (asphalt)
- Striping and Signage: Duration is anticipated to take approximately 3 working days. Equipment is anticipated to involve the following:
  - Power broom
  - Striping truck
  - Bobcat with auger
  - Approximately 2 truck loads of material (paint, thermoplastic, posts and signs)
- Landscape & Irrigation: Duration is anticipated to take approximately 15 working days. Equipment is anticipated to involve the following:
  - Spade truck
  - Case 580 backhoe
  - Two (2) Ditch Witch trenchers
  - Approximately 75 truck loads of material (trees, plants, bark, irrigation pipe, fittings and equipment)

Dirt Balance:

The earthwork for this project is anticipated at this time to balance and will not have a need for either import or export of dirt.

APPENDIX D

CalEEMOD Air Emissions Model Output

Rio Mesa Boulevard

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	53.08	Acre	53.08	2,312,339.04	0
Other Non-Asphalt Surfaces	2.93	Acre	2.93	127,805.04	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Adjusted per Construction General Information form.

Off-road Equipment -

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment - Adjusted per Construction General Information form.

Off-road Equipment -

Grading -

Construction Off-road Equipment Mitigation - Watering adjusted per Construction General Information form. Engine tiers adjusted per SJVAPCD Rule 9510.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	146,409.00	0.00
tblArchitecturalCoating	EF_Parking	150.00	0.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	18.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	75.00	10.00
tblConstructionPhase	NumDays	1,110.00	131.00
tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	75.00	23.00
tblConstructionPhase	NumDays	40.00	22.00
tblConstructionPhase	NumDays	40.00	21.00

tblConstructionPhase	NumDays	110.00	22.00
tblConstructionPhase	NumDays	1,110.00	131.00
tblConstructionPhase	NumDays	75.00	23.00
tblConstructionPhase	NumDays	75.00	11.00
tblConstructionPhase	PhaseEndDate	5/30/2023	8/14/2020
tblConstructionPhase	PhaseEndDate	11/1/2022	8/31/2020
tblConstructionPhase	PhaseEndDate	7/31/2018	4/30/2020
tblConstructionPhase	PhaseEndDate	2/14/2023	7/31/2020
tblConstructionPhase	PhaseEndDate	2/27/2018	3/31/2020
tblConstructionPhase	PhaseStartDate	2/15/2023	8/1/2020
tblConstructionPhase	PhaseStartDate	8/1/2018	3/1/2020
tblConstructionPhase	PhaseStartDate	2/28/2018	4/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2022	7/1/2020
tblConstructionPhase	PhaseStartDate	1/3/2018	3/1/2020
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	LoadFactor	0.48	0.48
tblOffRoadEquipment	LoadFactor	0.30	0.30
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.30	0.30
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.41	0.41

tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.40	0.40
tblOffRoadEquipment	LoadFactor	0.48	0.48
tblOffRoadEquipment	LoadFactor	0.30	0.30
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.30	0.30
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Dozers
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers

tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Surfacing Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2020	1.6687	9.3246	7.5019	0.0227	1.3937	0.3007	1.6944	0.4598	0.2773	0.7371	0.0000	2,063.3111	2,063.3111	0.2779	0.0000	2,070.2580
2024	0.8354	6.1445	5.8326	0.0212	1.3858	0.1795	1.5653	0.4552	0.1652	0.6204	0.0000	1,924.9288	1,924.9288	0.2538	0.0000	1,931.2731
Maximum	**1.6687**	**9.3246**	**7.5019**	**0.0227**	**1.3937**	**0.3007**	**1.6944**	**0.4598**	**0.2773**	**0.7371**	**0.0000**	**2,063.3111**	**2,063.3111**	**0.2779**	**0.0000**	**2,070.2580**

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					
2020	1.2088	3.6696	7.8418	0.0227	1.1596	0.0337	1.1933	0.3453	0.0325	0.3778	0.0000	2,063.3103	2,063.3103	0.2779	0.0000	2,070.2573
2024	0.5337	2.5552	6.5563	0.0212	1.1573	0.0194	1.1766	0.3437	0.0188	0.3625	0.0000	1,924.9280	1,924.9280	0.2538	0.0000	1,931.2724
Maximum	**1.2088**	**3.6696**	**7.8418**	**0.0227**	**1.1596**	**0.0337**	**1.1933**	**0.3453**	**0.0325**	**0.3778**	**0.0000**	**2,063.3103**	**2,063.3103**	**0.2779**	**0.0000**	**2,070.2573**

	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	**30.41**	**59.76**	**-7.98**	**0.00**	**16.64**	**88.95**	**27.30**	**24.70**	**88.41**	**45.47**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
10	**12-27-2019**	**3-26-2020**	1.6571	0.6231
11	**3-27-2020**	**6-26-2020**	5.3771	2.1544
12	**6-27-2020**	**9-26-2020**	3.9445	2.1032
26	**12-27-2023**	**3-26-2024**	1.0950	0.4387
27	**3-27-2024**	**6-26-2024**	3.5789	1.5234
28	**6-27-2024**	**9-26-2024**	2.3222	1.1398
		Highest	5.3771	2.1544

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	0.2087	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
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	**0.2087**	**0.0000**	**5.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

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	0.2087	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
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	**0.2087**	**0.0000**	**5.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

	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	Phase 1 Site Preparation	Site Preparation	3/1/2020	3/31/2020	5	22	
2	Phase 1 Grading	Grading	4/1/2020	4/30/2020	5	22	
3	Phase 1 Building Construction	Building Construction	3/1/2020	8/31/2020	5	131	
4	Phase 1 Paving	Paving	7/1/2020	7/31/2020	5	23	
5	Phase 1 Architectural Coating	Architectural Coating	8/1/2020	8/14/2020	5	10	
6	Phase 2 Site Preparation	Site Preparation	3/1/2024	3/31/2024	5	21	
7	Phase 2 Grading	Grading	4/1/2024	4/30/2024	5	22	
8	Phase 2 Building Construction	Building Construction	3/1/2024	8/31/2024	5	131	
9	Phase 2 Paving	Paving	7/1/2024	7/31/2024	5	23	
10	Phase 2 Architectural Coating	Architectural Coating	8/1/2024	8/15/2024	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 56.01

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 146,409 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Phase 1 Architectural Coating	Air Compressors	1	6.00	78	0.48
Phase 2 Architectural Coating	Air Compressors	1	6.00	78	0.48
Phase 2 Building Construction	Cranes	0	8.00	231	0.29
Phase 1 Grading	Excavators	2	8.00	158	0.38
Phase 1 Building Construction	Cranes	0	8.00	231	0.29
Phase 1 Building Construction	Forklifts	0	8.00	89	0.20

Phase 1 Building Construction	Generator Sets	0	8.00	84	0.74
Phase 1 Paving	Pavers	1	8.00	130	0.42
Phase 1 Paving	Rollers	1	8.00	80	0.38
Phase 2 Grading	Excavators	2	8.00	158	0.38
Phase 1 Grading	Rubber Tired Dozers	2	8.00	247	0.40
Phase 1 Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 1 Grading	Graders	3	8.00	187	0.41
Phase 1 Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 1 Paving	Paving Equipment	1	8.00	132	0.36
Phase 1 Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Phase 1 Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Phase 1 Grading	Scrapers	3	8.00	367	0.48
Phase 1 Building Construction	Welders	0	8.00	46	0.45
Phase 2 Building Construction	Forklifts	0	8.00	89	0.20
Phase 2 Building Construction	Generator Sets	0	8.00	84	0.74
Phase 2 Grading	Graders	3	8.00	187	0.41
Phase 2 Paving	Pavers	1	8.00	130	0.42
Phase 2 Paving	Paving Equipment	1	8.00	132	0.36
Phase 2 Paving	Rollers	1	8.00	80	0.38
Phase 2 Grading	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2 Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Phase 2 Grading	Scrapers	3	8.00	367	0.48
Phase 2 Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2 Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Phase 2 Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Phase 2 Building Construction	Welders	0	8.00	46	0.45
Phase 1 Building Construction	Excavators	2	8.00	158	0.38

Phase 1 Building Construction	Graders	2	8.00	187	0.41
Phase 1 Building Construction	Rollers	2	8.00	80	0.38
Phase 1 Building Construction	Rubber Tired Dozers	2	8.00	247	0.40
Phase 1 Building Construction	Scrapers	1	8.00	367	0.48
Phase 1 Building Construction	Surfacing Equipment	1	8.00	263	0.30
Phase 1 Building Construction	Trenchers	1	8.00	78	0.50
Phase 1 Paving	Graders	1	8.00	187	0.41
Phase 1 Paving	Rubber Tired Loaders	1	8.00	203	0.36
Phase 1 Paving	Surfacing Equipment	1	8.00	263	0.30
Phase 1 Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Phase 2 Building Construction	Excavators	2	8.00	158	0.38
Phase 2 Building Construction	Graders	2	8.00	187	0.41
Phase 2 Building Construction	Rollers	2	8.00	80	0.38
Phase 2 Building Construction	Rubber Tired Dozers	2	8.00	247	0.40
Phase 2 Building Construction	Scrapers	1	8.00	367	0.48
Phase 2 Building Construction	Surfacing Equipment	1	8.00	263	0.30
Phase 2 Building Construction	Trenchers	1	8.00	78	0.50
Phase 2 Paving	Graders	1	8.00	187	0.41
Phase 2 Paving	Rubber Tired Loaders	1	8.00	203	0.36
Phase 2 Paving	Surfacing Equipment	1	8.00	263	0.30
Phase 2 Paving	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
Phase 1 Architectural Coating	1	205.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 1 Building Construction	13	1,025.00	400.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 Architectural Coating	1	205.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 1 Grading	12	30.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 1 Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 1 Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 Building Construction	13	1,025.00	400.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 Grading	12	30.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Phase 2 Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Phase 1 Site Preparation - 2020

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					0.1987	0.0000	0.1987	0.1092	0.0000	0.1092	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0448	0.4666	0.2367	4.2000e-004		0.0242	0.0242		0.0222	0.0222	0.0000	36.7738	36.7738	0.0119	0.0000	37.0711
Total	**0.0448**	**0.4666**	**0.2367**	**4.2000e-004**	**0.1987**	**0.0242**	**0.2229**	**0.1092**	**0.0222**	**0.1315**	**0.0000**	**36.7738**	**36.7738**	**0.0119**	**0.0000**	**37.0711**

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	1.2600e-003	8.8000e-004	9.4900e-003	3.0000e-005	2.4500e-003	2.0000e-005	2.4700e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.2746	2.2746	7.0000e-005	0.0000	2.2764
Total	**1.2600e-003**	**8.8000e-004**	**9.4900e-003**	**3.0000e-005**	**2.4500e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.2746**	**2.2746**	**7.0000e-005**	**0.0000**	**2.2764**

3.2 Phase 1 Site Preparation - 2020

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					0.0775	0.0000	0.0775	0.0426	0.0000	0.0426	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.1200e-003	0.0222	0.2296	4.2000e-004		6.8000e-004	6.8000e-004		6.8000e-004	6.8000e-004	0.0000	36.7737	36.7737	0.0119	0.0000	37.0710
Total	**5.1200e-003**	**0.0222**	**0.2296**	**4.2000e-004**	**0.0775**	**6.8000e-004**	**0.0782**	**0.0426**	**6.8000e-004**	**0.0433**	**0.0000**	**36.7737**	**36.7737**	**0.0119**	**0.0000**	**37.0710**

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	1.2600e-003	8.8000e-004	9.4900e-003	3.0000e-005	2.4500e-003	2.0000e-005	2.4700e-003	6.5000e-004	2.0000e-005	6.7000e-004	0.0000	2.2746	2.2746	7.0000e-005	0.0000	2.2764
Total	**1.2600e-003**	**8.8000e-004**	**9.4900e-003**	**3.0000e-005**	**2.4500e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.2746**	**2.2746**	**7.0000e-005**	**0.0000**	**2.2764**

3.3 Phase 1 Grading - 2020

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					0.1850	0.0000	0.1850	0.0785	0.0000	0.0785	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0822	0.9453	0.5190	1.0900e-003		0.0395	0.0395		0.0364	0.0364	0.0000	95.6556	95.6556	0.0309	0.0000	96.4290
Total	**0.0822**	**0.9453**	**0.5190**	**1.0900e-003**	**0.1850**	**0.0395**	**0.2245**	**0.0785**	**0.0364**	**0.1148**	**0.0000**	**95.6556**	**95.6556**	**0.0309**	**0.0000**	**96.4290**

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	2.0900e-003	1.4700e-003	0.0158	4.0000e-005	4.0900e-003	3.0000e-005	4.1200e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.7910	3.7910	1.2000e-004	0.0000	3.7939
Total	**2.0900e-003**	**1.4700e-003**	**0.0158**	**4.0000e-005**	**4.0900e-003**	**3.0000e-005**	**4.1200e-003**	**1.0900e-003**	**3.0000e-005**	**1.1200e-003**	**0.0000**	**3.7910**	**3.7910**	**1.2000e-004**	**0.0000**	**3.7939**

3.3 Phase 1 Grading - 2020

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					0.0721	0.0000	0.0721	0.0306	0.0000	0.0306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0134	0.0579	0.5458	1.0900e-003		1.7800e-003	1.7800e-003		1.7800e-003	1.7800e-003	0.0000	95.6555	95.6555	0.0309	0.0000	96.4289
Total	**0.0134**	**0.0579**	**0.5458**	**1.0900e-003**	**0.0721**	**1.7800e-003**	**0.0739**	**0.0306**	**1.7800e-003**	**0.0324**	**0.0000**	**95.6555**	**95.6555**	**0.0309**	**0.0000**	**96.4289**

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	2.0900e-003	1.4700e-003	0.0158	4.0000e-005	4.0900e-003	3.0000e-005	4.1200e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.7910	3.7910	1.2000e-004	0.0000	3.7939
Total	**2.0900e-003**	**1.4700e-003**	**0.0158**	**4.0000e-005**	**4.0900e-003**	**3.0000e-005**	**4.1200e-003**	**1.0900e-003**	**3.0000e-005**	**1.1200e-003**	**0.0000**	**3.7910**	**3.7910**	**1.2000e-004**	**0.0000**	**3.7939**

3.4 Phase 1 Building Construction - 2020

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	0.3948	4.3476	2.5218	5.0600e-003		0.2033	0.2033		0.1870	0.1870	0.0000	444.9103	444.9103	0.1439	0.0000	448.5077
Total	**0.3948**	**4.3476**	**2.5218**	**5.0600e-003**		**0.2033**	**0.2033**		**0.1870**	**0.1870**	**0.0000**	**444.9103**	**444.9103**	**0.1439**	**0.0000**	**448.5077**

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	0.1080	2.9921	0.7431	6.9500e-003	0.1567	0.0155	0.1722	0.0453	0.0148	0.0601	0.0000	658.6579	658.6579	0.0553	0.0000	660.0412
Worker	0.4256	0.2989	3.2183	8.5400e-003	0.8315	6.5900e-003	0.8381	0.2210	6.0700e-003	0.2271	0.0000	771.2667	771.2667	0.0239	0.0000	771.8648
Total	**0.5336**	**3.2909**	**3.9614**	**0.0155**	**0.9882**	**0.0221**	**1.0103**	**0.2663**	**0.0209**	**0.2872**	**0.0000**	**1,429.9246**	**1,429.9246**	**0.0793**	**0.0000**	**1,431.9060**

3.4 Phase 1 Building Construction - 2020

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	0.0621	0.2692	2.7830	5.0600e-003		8.2800e-003	8.2800e-003		8.2800e-003	8.2800e-003	0.0000	444.9098	444.9098	0.1439	0.0000	448.5071
Total	**0.0621**	**0.2692**	**2.7830**	**5.0600e-003**		**8.2800e-003**	**8.2800e-003**		**8.2800e-003**	**8.2800e-003**	**0.0000**	**444.9098**	**444.9098**	**0.1439**	**0.0000**	**448.5071**

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	0.1080	2.9921	0.7431	6.9500e-003	0.1567	0.0155	0.1722	0.0453	0.0148	0.0601	0.0000	658.6579	658.6579	0.0553	0.0000	660.0412
Worker	0.4256	0.2989	3.2183	8.5400e-003	0.8315	6.5900e-003	0.8381	0.2210	6.0700e-003	0.2271	0.0000	771.2667	771.2667	0.0239	0.0000	771.8648
Total	**0.5336**	**3.2909**	**3.9614**	**0.0155**	**0.9882**	**0.0221**	**1.0103**	**0.2663**	**0.0209**	**0.2872**	**0.0000**	**1,429.9246**	**1,429.9246**	**0.0793**	**0.0000**	**1,431.9060**

3.5 Phase 1 Paving - 2020

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	0.0223	0.2580	0.1697	3.9000e-004		0.0109	0.0109		0.0101	0.0101	0.0000	34.5515	34.5515	0.0112	0.0000	34.8309
Paving	0.0695					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0919**	**0.2580**	**0.1697**	**3.9000e-004**		**0.0109**	**0.0109**		**0.0101**	**0.0101**	**0.0000**	**34.5515**	**34.5515**	**0.0112**	**0.0000**	**34.8309**

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	1.3100e-003	9.2000e-004	9.9200e-003	3.0000e-005	2.5600e-003	2.0000e-005	2.5800e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.3780	2.3780	7.0000e-005	0.0000	2.3798
Total	**1.3100e-003**	**9.2000e-004**	**9.9200e-003**	**3.0000e-005**	**2.5600e-003**	**2.0000e-005**	**2.5800e-003**	**6.8000e-004**	**2.0000e-005**	**7.0000e-004**	**0.0000**	**2.3780**	**2.3780**	**7.0000e-005**	**0.0000**	**2.3798**

3.5 Phase 1 Paving - 2020

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	4.8400e-003	0.0210	0.2285	3.9000e-004		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	34.5514	34.5514	0.0112	0.0000	34.8308
Paving	0.0695					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0744**	**0.0210**	**0.2285**	**3.9000e-004**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**34.5514**	**34.5514**	**0.0112**	**0.0000**	**34.8308**

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	1.3100e-003	9.2000e-004	9.9200e-003	3.0000e-005	2.5600e-003	2.0000e-005	2.5800e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.3780	2.3780	7.0000e-005	0.0000	2.3798
Total	**1.3100e-003**	**9.2000e-004**	**9.9200e-003**	**3.0000e-005**	**2.5600e-003**	**2.0000e-005**	**2.5800e-003**	**6.8000e-004**	**2.0000e-005**	**7.0000e-004**	**0.0000**	**2.3780**	**2.3780**	**7.0000e-005**	**0.0000**	**2.3798**

3.6 Phase 1 Architectural Coating - 2020

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					
Archit. Coating	0.5090					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2100e-003	8.4200e-003	9.1600e-003	1.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.5102**	**8.4200e-003**	**9.1600e-003**	**1.0000e-005**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

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	6.5000e-003	4.5600e-003	0.0491	1.3000e-004	0.0127	1.0000e-004	0.0128	3.3700e-003	9.0000e-005	3.4700e-003	0.0000	11.7751	11.7751	3.7000e-004	0.0000	11.7842
Total	**6.5000e-003**	**4.5600e-003**	**0.0491**	**1.3000e-004**	**0.0127**	**1.0000e-004**	**0.0128**	**3.3700e-003**	**9.0000e-005**	**3.4700e-003**	**0.0000**	**11.7751**	**11.7751**	**3.7000e-004**	**0.0000**	**11.7842**

3.6 Phase 1 Architectural Coating - 2020

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					
Archit. Coating	0.5090					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5000e-004	6.4000e-004	9.1600e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.2766	1.2766	1.0000e-004	0.0000	1.2791
Total	**0.5091**	**6.4000e-004**	**9.1600e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.2766**	**1.2766**	**1.0000e-004**	**0.0000**	**1.2791**

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	6.5000e-003	4.5600e-003	0.0491	1.3000e-004	0.0127	1.0000e-004	0.0128	3.3700e-003	9.0000e-005	3.4700e-003	0.0000	11.7751	11.7751	3.7000e-004	0.0000	11.7842
Total	**6.5000e-003**	**4.5600e-003**	**0.0491**	**1.3000e-004**	**0.0127**	**1.0000e-004**	**0.0128**	**3.3700e-003**	**9.0000e-005**	**3.4700e-003**	**0.0000**	**11.7751**	**11.7751**	**3.7000e-004**	**0.0000**	**11.7842**

3.7 Phase 2 Site Preparation - 2024

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					0.1897	0.0000	0.1897	0.1043	0.0000	0.1043	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.2854	0.1925	4.0000e-004		0.0129	0.0129		0.0119	0.0119	0.0000	35.1299	35.1299	0.0114	0.0000	35.4140
Total	**0.0279**	**0.2854**	**0.1925**	**4.0000e-004**	**0.1897**	**0.0129**	**0.2026**	**0.1043**	**0.0119**	**0.1162**	**0.0000**	**35.1299**	**35.1299**	**0.0114**	**0.0000**	**35.4140**

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	8.9000e-004	5.4000e-004	6.4000e-003	2.0000e-005	2.3400e-003	2.0000e-005	2.3600e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	1.8820	1.8820	4.0000e-005	0.0000	1.8831
Total	**8.9000e-004**	**5.4000e-004**	**6.4000e-003**	**2.0000e-005**	**2.3400e-003**	**2.0000e-005**	**2.3600e-003**	**6.2000e-004**	**2.0000e-005**	**6.4000e-004**	**0.0000**	**1.8820**	**1.8820**	**4.0000e-005**	**0.0000**	**1.8831**

3.7 Phase 2 Site Preparation - 2024

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					0.0740	0.0000	0.0740	0.0407	0.0000	0.0407	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8900e-003	0.0212	0.2191	4.0000e-004		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	35.1299	35.1299	0.0114	0.0000	35.4139
Total	**4.8900e-003**	**0.0212**	**0.2191**	**4.0000e-004**	**0.0740**	**6.5000e-004**	**0.0746**	**0.0407**	**6.5000e-004**	**0.0413**	**0.0000**	**35.1299**	**35.1299**	**0.0114**	**0.0000**	**35.4139**

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	8.9000e-004	5.4000e-004	6.4000e-003	2.0000e-005	2.3400e-003	2.0000e-005	2.3600e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	1.8820	1.8820	4.0000e-005	0.0000	1.8831
Total	**8.9000e-004**	**5.4000e-004**	**6.4000e-003**	**2.0000e-005**	**2.3400e-003**	**2.0000e-005**	**2.3600e-003**	**6.2000e-004**	**2.0000e-005**	**6.4000e-004**	**0.0000**	**1.8820**	**1.8820**	**4.0000e-005**	**0.0000**	**1.8831**

3.8 Phase 2 Grading - 2024

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					0.1850	0.0000	0.1850	0.0785	0.0000	0.0785	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0592	0.6106	0.4415	1.0900e-003		0.0245	0.0245		0.0226	0.0226	0.0000	95.6674	95.6674	0.0309	0.0000	96.4409
Total	**0.0592**	**0.6106**	**0.4415**	**1.0900e-003**	**0.1850**	**0.0245**	**0.2095**	**0.0785**	**0.0226**	**0.1011**	**0.0000**	**95.6674**	**95.6674**	**0.0309**	**0.0000**	**96.4409**

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	1.5500e-003	9.4000e-004	0.0112	4.0000e-005	4.0900e-003	3.0000e-005	4.1200e-003	1.0900e-003	3.0000e-005	1.1100e-003	0.0000	3.2860	3.2860	8.0000e-005	0.0000	3.2879
Total	**1.5500e-003**	**9.4000e-004**	**0.0112**	**4.0000e-005**	**4.0900e-003**	**3.0000e-005**	**4.1200e-003**	**1.0900e-003**	**3.0000e-005**	**1.1100e-003**	**0.0000**	**3.2860**	**3.2860**	**8.0000e-005**	**0.0000**	**3.2879**

3.8 Phase 2 Grading - 2024

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					0.0721	0.0000	0.0721	0.0306	0.0000	0.0306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0134	0.0579	0.5458	1.0900e-003		1.7800e-003	1.7800e-003		1.7800e-003	1.7800e-003	0.0000	95.6673	95.6673	0.0309	0.0000	96.4408
Total	**0.0134**	**0.0579**	**0.5458**	**1.0900e-003**	**0.0721**	**1.7800e-003**	**0.0739**	**0.0306**	**1.7800e-003**	**0.0324**	**0.0000**	**95.6673**	**95.6673**	**0.0309**	**0.0000**	**96.4408**

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	1.5500e-003	9.4000e-004	0.0112	4.0000e-005	4.0900e-003	3.0000e-005	4.1200e-003	1.0900e-003	3.0000e-005	1.1100e-003	0.0000	3.2860	3.2860	8.0000e-005	0.0000	3.2879
Total	**1.5500e-003**	**9.4000e-004**	**0.0112**	**4.0000e-005**	**4.0900e-003**	**3.0000e-005**	**4.1200e-003**	**1.0900e-003**	**3.0000e-005**	**1.1100e-003**	**0.0000**	**3.2860**	**3.2860**	**8.0000e-005**	**0.0000**	**3.2879**

3.9 Phase 2 Building Construction - 2024

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	0.2824	2.8869	2.2541	5.0600e-003		0.1270	0.1270		0.1168	0.1168	0.0000	444.7818	444.7818	0.1439	0.0000	448.3781
Total	**0.2824**	**2.8869**	**2.2541**	**5.0600e-003**		**0.1270**	**0.1270**		**0.1168**	**0.1168**	**0.0000**	**444.7818**	**444.7818**	**0.1439**	**0.0000**	**448.3781**

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	0.0552	1.9879	0.4349	6.6000e-003	0.1567	1.8800e-003	0.1586	0.0453	1.7900e-003	0.0471	0.0000	626.4405	626.4405	0.0404	0.0000	627.4505
Worker	0.3149	0.1920	2.2721	7.3900e-003	0.8315	5.9400e-003	0.8375	0.2210	5.4700e-003	0.2265	0.0000	668.5270	668.5270	0.0156	0.0000	668.9157
Total	**0.3701**	**2.1799**	**2.7071**	**0.0140**	**0.9882**	**7.8200e-003**	**0.9960**	**0.2663**	**7.2600e-003**	**0.2736**	**0.0000**	**1,294.9675**	**1,294.9675**	**0.0560**	**0.0000**	**1,296.3662**

3.9 Phase 2 Building Construction - 2024

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	0.0621	0.2692	2.7830	5.0600e-003		8.2800e-003	8.2800e-003		8.2800e-003	8.2800e-003	0.0000	444.7813	444.7813	0.1439	0.0000	448.3776
Total	**0.0621**	**0.2692**	**2.7830**	**5.0600e-003**		**8.2800e-003**	**8.2800e-003**		**8.2800e-003**	**8.2800e-003**	**0.0000**	**444.7813**	**444.7813**	**0.1439**	**0.0000**	**448.3776**

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	0.0552	1.9879	0.4349	6.6000e-003	0.1567	1.8800e-003	0.1586	0.0453	1.7900e-003	0.0471	0.0000	626.4405	626.4405	0.0404	0.0000	627.4505
Worker	0.3149	0.1920	2.2721	7.3900e-003	0.8315	5.9400e-003	0.8375	0.2210	5.4700e-003	0.2265	0.0000	668.5270	668.5270	0.0156	0.0000	668.9157
Total	**0.3701**	**2.1799**	**2.7071**	**0.0140**	**0.9882**	**7.8200e-003**	**0.9960**	**0.2663**	**7.2600e-003**	**0.2736**	**0.0000**	**1,294.9675**	**1,294.9675**	**0.0560**	**0.0000**	**1,296.3662**

3.10 Phase 2 Paving - 2024

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	0.0165	0.1697	0.1648	3.9000e-004		6.8000e-003	6.8000e-003		6.2600e-003	6.2600e-003	0.0000	34.5215	34.5215	0.0112	0.0000	34.8006
Paving	0.0695					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0860**	**0.1697**	**0.1648**	**3.9000e-004**		**6.8000e-003**	**6.8000e-003**		**6.2600e-003**	**6.2600e-003**	**0.0000**	**34.5215**	**34.5215**	**0.0112**	**0.0000**	**34.8006**

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	9.7000e-004	5.9000e-004	7.0100e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5800e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.0612	2.0612	5.0000e-005	0.0000	2.0624
Total	**9.7000e-004**	**5.9000e-004**	**7.0100e-003**	**2.0000e-005**	**2.5600e-003**	**2.0000e-005**	**2.5800e-003**	**6.8000e-004**	**2.0000e-005**	**7.0000e-004**	**0.0000**	**2.0612**	**2.0612**	**5.0000e-005**	**0.0000**	**2.0624**

3.10 Phase 2 Paving - 2024

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	4.8400e-003	0.0210	0.2285	3.9000e-004		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	34.5214	34.5214	0.0112	0.0000	34.8005
Paving	0.0695					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0744**	**0.0210**	**0.2285**	**3.9000e-004**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**34.5214**	**34.5214**	**0.0112**	**0.0000**	**34.8005**

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	9.7000e-004	5.9000e-004	7.0100e-003	2.0000e-005	2.5600e-003	2.0000e-005	2.5800e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.0612	2.0612	5.0000e-005	0.0000	2.0624
Total	**9.7000e-004**	**5.9000e-004**	**7.0100e-003**	**2.0000e-005**	**2.5600e-003**	**2.0000e-005**	**2.5800e-003**	**6.8000e-004**	**2.0000e-005**	**7.0000e-004**	**0.0000**	**2.0612**	**2.0612**	**5.0000e-005**	**0.0000**	**2.0624**

3.11 Phase 2 Architectural Coating - 2024

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					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	6.7000e-003	9.9600e-003	2.0000e-005		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	1.4043	1.4043	8.0000e-005	0.0000	1.4063
Total	**9.9000e-004**	**6.7000e-003**	**9.9600e-003**	**2.0000e-005**		**3.4000e-004**	**3.4000e-004**		**3.4000e-004**	**3.4000e-004**	**0.0000**	**1.4043**	**1.4043**	**8.0000e-005**	**0.0000**	**1.4063**

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	5.2900e-003	3.2200e-003	0.0382	1.2000e-004	0.0140	1.0000e-004	0.0141	3.7100e-003	9.0000e-005	3.8000e-003	0.0000	11.2272	11.2272	2.6000e-004	0.0000	11.2337
Total	**5.2900e-003**	**3.2200e-003**	**0.0382**	**1.2000e-004**	**0.0140**	**1.0000e-004**	**0.0141**	**3.7100e-003**	**9.0000e-005**	**3.8000e-003**	**0.0000**	**11.2272**	**11.2272**	**2.6000e-004**	**0.0000**	**11.2337**

3.11 Phase 2 Architectural Coating - 2024

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					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6000e-004	7.1000e-004	0.0101	2.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.4043	1.4043	8.0000e-005	0.0000	1.4063
Total	**1.6000e-004**	**7.1000e-004**	**0.0101**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.4043**	**1.4043**	**8.0000e-005**	**0.0000**	**1.4063**

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	5.2900e-003	3.2200e-003	0.0382	1.2000e-004	0.0140	1.0000e-004	0.0141	3.7100e-003	9.0000e-005	3.8000e-003	0.0000	11.2272	11.2272	2.6000e-004	0.0000	11.2337
Total	**5.2900e-003**	**3.2200e-003**	**0.0382**	**1.2000e-004**	**0.0140**	**1.0000e-004**	**0.0141**	**3.7100e-003**	**9.0000e-005**	**3.8000e-003**	**0.0000**	**11.2272**	**11.2272**	**2.6000e-004**	**0.0000**	**11.2337**

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
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	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
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	14.70	6.60	6.60	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
Other Asphalt Surfaces	0.503915	0.034676	0.165713	0.136480	0.026945	0.006547	0.014223	0.096547	0.002825	0.001855	0.007748	0.001320	0.001206
Other Non-Asphalt Surfaces	0.503915	0.034676	0.165713	0.136480	0.026945	0.006547	0.014223	0.096547	0.002825	0.001855	0.007748	0.001320	0.001206

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					
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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					
Other Asphalt Surfaces	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
Other Non-Asphalt Surfaces	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			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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	0.2087	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Unmitigated	0.2087	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003

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	0.0509					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Total	**0.2087**	**0.0000**	**5.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

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	0.0509					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1577					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0000e-005	0.0000	5.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-003	1.0000e-003	0.0000	0.0000	1.0700e-003
Total	**0.2087**	**0.0000**	**5.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**0.0000**	**1.0700e-003**

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			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	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

APPENDIX E

Biological Resources Assessment - Rio Mesa Boulevard Project

(ECORP 2020)

Biological Resources Assessment

Rio Mesa Boulevard Project

Madera County, California

Prepared for:

Madera County

May 20, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Citation: ECORP Consulting, Inc. 2020. Biological Resources Assessment for the Rio Mesa Boulevard, Madera County, California. Prepared for Madera County. May 2020.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

BA	biological assessment
BO	biological opinion
BRA	biological resources assessment
BCC	Birds of Conservation Concern
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society
CNDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
CWA	Clean Water Act's
CFR	Code of Federal Regulations
DPS	Discreet Population Segment
ECORP	ECORP Consulting, Inc.
HCP	habitat conservation plan
LF	linear feet
MSL	mean sea level
MBTA	Migratory Bird Treaty Act
NMFS	National Marine Fisheries Service
NCCP	Natural Community Conservation Plan
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
RWQCB	Regional Water Quality Control Board
Project	Rio Mesa Boulevard Project
SSC	Species of Special Concern

LIST OF ACRONYMS AND ABBREVIATIONS

SR	State Route
TRBL	tricolored blackbird
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
EFH	Essential Fish Habitat
NPDES	National Pollutant Discharge Elimination System
SSURGO	Soil Survey Geographic
Section 404 Permit	Section 404 of the federal CWA
WBWG	Western Bat Working Group

1.0 INTRODUCTION

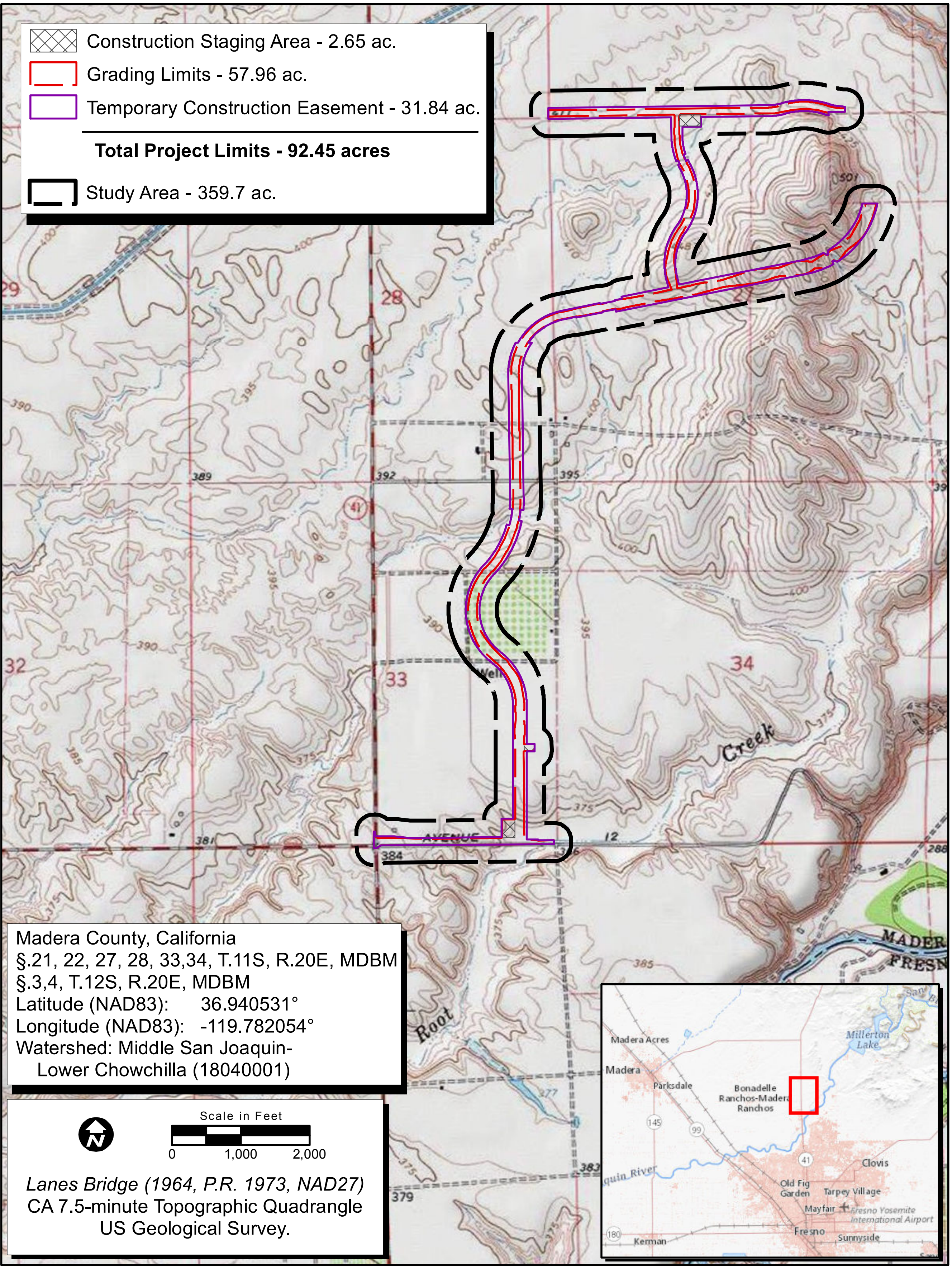
ECORP Consulting, Inc. (ECORP) has conducted a biological resources assessment (BRA) for the proposed Rio Mesa Boulevard Project (Project) located in Madera County, California. The purpose of the assessment was to collect information on the biological resources present within the Study Area, and to determine potential biological constraints to Project activities. For the purposes of this BRA, the Study Area consists of the Project grading limits, a temporary construction easement, construction staging areas, and a 250-foot buffer (Figure 1. *Location and Vicinity*).

1.1 Study Area Location

The ±359.7-acre Study Area is located within the Rio Mesa Area Plan area, east of State Route 41, from Avenue 14 to Avenue 12 in Madera County, California. The Study Area corresponds to Section 21, 22, 27, 28, 33, and 34, Township 11 South, and Range 20 East, and to Sections 3 and 4, Township 12 South, and Range 20 East (Mount Diablo Base Meridian) of the "Lanes Bridge, California" 7.5-minute quadrangle (U.S. Geological Survey [USGS] 1964, photorevised 1973) (see Figure 1). The Study Area is located within the Middle San Joaquin-Lower Chowchilla Watershed at the following coordinates: 36.940531 ˚N and -119.782054 ˚W (Hydrologic Unit Code #18040001, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016).

1.2 Project Description

The proposed Project would construct a new north-south roadway consistent with a secondary arterial (4-lane undivided). The proposed roadway would include: two northbound and two southbound asphalt concrete lanes with six-foot-wide asphalt concrete bike lanes, curbs and gutters, landscaping, and separated sidewalks between Avenue 12 and the southernmost portion of Tesoro Viejo. The proposed RMB will also construct utility improvements for water, sewer, recycled water, fire hydrants, streetlights, drainage, roadway signage, and roadway striping. Additionally, two linked utility line corridors and gravel access roads along Avenue 14 and south to connect to Rio Mesa Boulevard will be constructed.



▨ Construction Staging Area - 2.65 ac.

🟥 Grading Limits - 57.96 ac.

🟪 Temporary Construction Easement - 31.84 ac.

Total Project Limits - 92.45 acres

⬚ Study Area - 359.7 ac.

Madera County, California
§.21, 22, 27, 28, 33,34, T.11S, R.20E, MDBM
§.3,4, T.12S, R.20E, MDBM
Latitude (NAD83): 36.940531°
Longitude (NAD83): -119.782054°
Watershed: Middle San Joaquin-
Lower Chowchilla (18040001)

Lanes Bridge (1964, P.R. 1973, NAD27)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Location_Vicinity\RMRA_LnV_V11_Calculations.mxd (CCH)-chinkelman 4/6/2020

Map Date: 4/6/2020
Sources: ESRI, USGS, Morton and Pitalo

Figure 1. Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Boulevard

1.3 Purpose of this Biological Resources Assessment

The purpose of this BRA is to assess the potential for occurrence of special-status plant and animal species or their habitat, and sensitive habitats such as wetlands within the Study Area. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in this report are based upon a review of the available literature and site reconnaissance.

For the purposes of this assessment, special-status species are defined as plants or animals that:

- Are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- Are listed or candidates for future listing as threatened or endangered under the California ESA;
- Meet the definitions of endangered or rare under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;
- Are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- Are birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS);
- Are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- Plants listed by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4);
- Are plants listed as rare under the California Native Plant Protection Act (NPPA; California Fish and Game Code, § 1900 et seq.); or
- Are fully protected in California in accordance with the California Fish and Game Code §§ 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

Only species that fall into one of the above listed groups were considered for this assessment. Other species without special status that are sometimes found in database or literature searches were not included within this analysis.

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The ESA protects plants and animals that are listed as endangered or threatened by the USFWS and the NMFS. Section 9 of the ESA prohibits the taking of listed wildlife, where take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion (BO), the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

Section 7

Section 7 of the ESA mandates that all federal agencies consult with USFWS and/or NMFS to ensure that federal agencies' actions do not jeopardize the continued existence of a listed species or adversely modify Critical Habitat for listed species. If direct and/or indirect effects will occur to Critical Habitat that appreciably diminish the value of Critical Habitat for both the survival and recovery of a species, the adverse modifications will require formal consultation with USFWS or NMFS. If adverse effects are likely, the applicant must conduct a biological assessment (BA) for the purpose of analyzing the potential effects of the project on listed species and critical habitat to establish and justify an "effect determination." The federal agency reviews the BA; if it concludes that the project may adversely affect a listed species or its habitat, it prepares a BO. The BO may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat.

Section 10

When no discretionary action is being taken by a federal agency but a project may result in the take of listed species, an incidental take permit under Section 10 of the ESA is necessary. The purpose of the incidental take permit is to authorize the take of federally listed species that may result from an otherwise lawful activity, not to authorize the activities themselves. In order to obtain an incidental take permit under Section 10, an application must be submitted that includes a HCP. In some instances, applicants, USFWS, and/or NMFS may determine that a HCP is necessary or prudent, even if a discretionary federal action will occur. The purpose of the HCP planning process associated with the permit application is to ensure that adequate minimization and mitigation for impacts to listed species and/or their habitat will occur.

Critical Habitat and Essential Habitat

Critical Habitat is defined in Section 3 of the ESA as (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For inclusion in a Critical Habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features that are essential to the conservation of the species. Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species (areas on which are found the primary constituent elements). Primary constituent elements are the physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These include but are not limited to the following:

- Space for individual and population growth and for normal behavior;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, or rearing (or development) of offspring; or
- Habitats that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of a species.

Excluded essential habitat is defined as areas that were found to be essential habitat for the survival of a species and assumed to contain at least one of the primary constituent elements for the species but were excluded from the Critical Habitat designation. The USFWS has stated that any action within the excluded essential habitat that triggers a federal nexus will be required to undergo the Section 7(a)(1) process, and the species covered under the specific Critical Habitat designation would be afforded protection under Section 7(a)(2) of ESA.

Essential Fish Habitat

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), federal agencies are required to consult with the NMFS for activities that may affect Essential Fish Habitat (EFH). EFH are the waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity, and include several important components: adequate substrate; water quality; water quantity, depth, and velocity; channel gradient and stability; food; cover and habitat complexity; space; access and passage; and habitat connectivity (Pacific Fishery Management Council 2000).

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 USC 668(a); 50 CFR 22). USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

2.1.4 Federal Clean Water Act

The federal Clean Water Act's (CWA) purpose is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the U.S." without a permit from the U.S. Army Corps of Engineers (USACE). The definition of Waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3[b]). The USEPA also has authority over wetlands and may override a USACE permit.

Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

The alteration of a USACE federally authorized civil works project requires a permit pursuant to Section 408 (33 USC 408, Section 14 of the Rivers and Harbors Act of 1899). Projects with minimal impacts require approval by the USACE Sacramento District Construction Operations Group; however, projects with more substantial impacts may require USACE Headquarters review. Coordination with the Central Valley Flood Protection Board, who serve as the Non-Federal Sponsor, is required as a part of the process of obtaining a Section 408 permit.

2.2 State or Local Regulations

2.2.1 California Fish and Game Code

California Endangered Species Act

The California ESA (Fish and Game Code Sections 2050-2116) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called "candidates" by the State). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened, or candidate species or result in destruction or adverse modification of essential habitat.

Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the federal ESA and California ESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the California ESA and/or federal ESA. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code § 4700 for mammals, § 3511 for birds, § 5050 for reptiles and amphibians, and § 5515 for fish) provide that fully protected species may not be taken or possessed at any time. Furthermore, the CDFW prohibits any State agency from issuing incidental take permits for fully protected species. The CDFW will issue licenses or permits for take of these species for necessary scientific research or live capture and relocation pursuant to the permit.

Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code §§ 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

Birds of Prey

Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA.

Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Additionally, Subsection 3503.5 prohibits the take, possession, or destruction of any birds and their nests in the orders Strigiformes (owls) or Falconiformes (hawks and eagles). These provisions, along with the federal MBTA, serve to protect nesting native birds.

2.2.2 Species of Special Concern

SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under the federal ESA, California ESA, or the California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role;
- The species is listed as federally (but not State) threatened or endangered, or meets the State definition of threatened or endangered but has not formally been listed;
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; and
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for State threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, state-threatened, or endangered species are considered “significant” under CEQA.

2.2.3 California Rare Plant Ranks

The CNPS maintains the *Inventory of Rare and Endangered Plants of California* (CNPS 2019), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and the CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere.
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere.
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere.
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere.
- Rare Plant Rank 3 – a review list of plants about which more information is needed.
- Rare Plant Rank 4 – a watch list of plants of limited distribution.

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 1 through 3, with 1 being the most threatened and 3 being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

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

Factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection. Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines § 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

2.2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities.

2.2.5 California Environmental Quality Act

In accordance with CEQA Guidelines § 15380, a species not protected on a federal or State list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in the federal ESA, California ESA, and §§ 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the CEQA Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either USFWS or CDFW.

CEQA Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant and are particularly relevant to SSC. Generally, impacts to listed (rare, threatened, or endangered) species are considered significant and require lead agencies to prepare an Environmental Impact Report to thoroughly analyze and evaluate the impacts. Assessment of "impact significance" to populations of non-listed species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Specifically, § 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if the project would:

- 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 CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected Waters of the U.S. including wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- 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;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional or state HCP.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.2.6 Local Plans and Ordinances

Madera County General Plan

Section 5: Agricultural and Natural Resources of the *Madera County General Plan Policy Document* includes several goals and policies related to the protection of forest resources, water resources, wetland and riparian areas, fish and wildlife habitat, and vegetation. Additionally, Section 5 includes several goals and policies related to open space for the preservation of natural resources (Madera County 1995).

The goals and policies emphasize minimization of construction related impacts to flood waters, flowing rivers, streams, creeks, or reservoir waters and requires implementation of best management policies to prevent impacts to water resources. The goals and policies also include compliance wetlands policies of the USACE, USFWS, and CDFW; mitigation for loss of regulated and unregulated wetlands; implementation of riparian protection zones; conservation of upland areas adjacent to wetlands; preservation and enhancement of native riparian habitat at a ratio of 3:1; protection of critical nesting foraging areas; and preservation of habitat for rare, threatened, endangered, and/or other special-status species (Madera County 1995).

3.0 METHODS

A BRA for the Rio Mesa Boulevard Project was originally prepared by ECORP in 2017. Since that time, changes to the alignment occurred. Combined with the fact that years have elapsed, this led to an update of the BRA. Species information, including regulatory status and protections, can change year to year. This BRA therefore represents the most up-to-date information regarding natural resources within the Study Area. However, site visits and surveys conducted since the BRA was prepared in 2017 are discussed in this BRA.

3.1 Literature Review

The following resources were reviewed to determine the special-status species that have been documented within or in the vicinity of the Study Area. Results of the species searches are included as Attachment A.

- CDFW CNDDB data for the "Lanes Bridge, California" 7.5-minute quadrangle as well as the eight surrounding USGS quadrangles (CDFW 2020);
- USFWS Information, Planning, and Consultation System Resource Report List for the Study Area (USFWS 2020); and
- CNPS' electronic Inventory of Rare and Endangered Plants of California was queried for the "Lanes Bridge, California" 7.5-minute quadrangles and the eight surrounding quadrangles (CNPS 2020);

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the Study Area from the following sources:

- CDFW Biogeographic Information and Observation System (BIOS) query of range maps for potentially occurring special-status species (CDFW 2020); and
- USFWS Threatened & Endangered Species Active Critical Habitat Report (USFWS 2020).
- Special Animals List (CDFW 2019);
- California Bird Species of Special Concern (Shuford and Gardali 2008);
- Amphibian and Reptile Species of Special Concern in California (Thompson, Wright, and Shaffer 2016);
- Mammalian Species of Special Concern in California (Williams 1986);
- California's Wildlife, Volumes I-III (Zeiner, et al. 1988, 1990a, 1990b); and
- A Guide to Wildlife Habitats of California (Mayer and Laudenslayer Jr., eds. 1988).

3.2 Site Reconnaissance

ECORP Biologists Ariel Miller, Carly White, Clay DeLong, and Emily Mecke conducted the site reconnaissance visits on March 15, and April 18, 19, and 20, 2017. The Study Area was systematically surveyed on foot using a Trimble GPS unit with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the Study Area with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and the following biological resource information was collected:

- Potential Wetlands and other Waters of the U.S.;
- Plant and animal species directly observed;
- Animal evidence (e.g., scat, tracks);
- Existing active raptor nest locations;
- Burrows and any other special habitat features; and
- Representative Study Area photographs (Attachment B).

In addition, soil types were identified using the NRCS Web Soil Survey (NRCS 2017a).

3.3 Additional Surveys Conducted

In addition to the reconnaissance surveys conducted for the Study Area, the following additional surveys were conducted for the entire Study Area or portions of the Study Area.

3.3.1 Aquatic Resources Delineation

ECORP biologists conducted an Aquatic Resources Delineation for the site on April 18, 19, and 20, 2017 and August 8 and 9, 2017; however, the boundaries of the potential wetlands and other Waters of the U.S. have not been verified by USACE. Preliminary results of the Aquatic Resources Delineation are discussed in Section 4.3.

3.3.2 Special-Status Plant Surveys

Guideline-level special-status plant surveys (early and late season) were conducted by ECORP biologists Ariel Miller, Casey Peters, Clay DeLong, and Emily Mecke for the majority of the Study Area in accordance with guidelines promulgated by USFWS (USFWS 2000), CDFW (CDFG 2009), and CNPS (CNPS 2019) on April 18, 19, and 20, 2017 and June 21, 22, and 23, 2017 (ECORP 2020). Additional special-status plant surveys were conducted by Emily Mecke and Clay DeLong on April 16, 17, and 18, 2019; by Emily Mecke and Todd Wood on May 6, 2019; and on March 11, 2020 by ECORP biologists Krissy Walker-Berry and Hannah Stone.

3.4 Special-Status Species Considered for the Project

Based on species occurrence information from the literature review and observations in the field, a list of special-status plant and animal species that have the potential to occur within the Study Area was generated (Table 1). Only special-status species as defined in Section 1.5 were included in this analysis. Each of these species' potential to occur within the Study Area was assessed based on the following criteria:

- **Present** - Species was observed during the site visit or is known to occur within the Study Area based on documented occurrences within the CNDDB or other literature.
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the Study Area.
- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur within the vicinity of the Study Area based on CNDDB records and other available documentation.
- **Absent** - No suitable habitat (including soils and elevation requirements) and/or the species is not known to occur within the vicinity of the Study Area based on CNDDB records and other documentation.

4.0 RESULTS

4.1 Site Characteristics and Land Use

The Study Area is located east of SR-41 and west of the San Joaquin River. The Study Area and surrounding areas are characterized by agricultural uses including cultivated annual crops and orchards and annual grassland with a few rural residential homes. The Study Area is composed of gently rolling terrain in the northern portion of the Study Area and flat terrain in the southern portion of the Study Area, where agricultural fields have leveled the land. Elevation ranges within the Study Area from approximately 380 to 470 feet above mean sea level (MSL). A transmission line and transmission towers bisect the center of the Study Area.

4.2 Vegetation Communities and Land Cover Types

During the field visit, four vegetation communities and land cover types were identified within the Study Area. These include annual grassland, orchard, agriculture, and ruderal. These vegetation communities and land cover types are described below.

4.2.1 Annual Grassland

The northern portion of the Study Area is characterized by nonnative annual grassland. These areas were primarily dominated by soft chess (*Bromus hordeaceous*) with other dominates including Mediterranean barley (*Hordeum marinum*), foxtail barely (*Hordeum murinum*), and broadleaf filaree (*Erodium botrys*).

4.2.2 Orchard

The northern boundary of the Study Area abuts an existing orchard. Trees present within the orchard in the northeast portion of the Study Area during the 2020 survey included newly planted black poplar (*Populus nigra*) and a more established hardwood species that was not identifiable during the time of the survey. The understory of the orchard is dominated by nonnative grasses and forbs including foxtail barley, soft chess, ripgut brome (*Bromus diandrus*), bur clover (*Medicago polymorpha*), and red stemmed filaree (*Erodium cicutarium*).

4.2.3 Agriculture

Several areas in the northern and southern portions of the Study Area were characterized by agricultural fields. The agricultural fields were either disced or in active production. The disced agricultural fields are dominated by nonnative annual grasses and forbs including cultivated oat (*Avena sativa*), ripgut brome, soft chess, wild oat (*Avena fatua*), Italian ryegrass (*Festuca perennis*), fescue brome (*Festuca bromoides*), winter vetch (*Vicia villosa*), and yellow wild radish (*Raphanus raphanistrum*). The agricultural fields in active production were planted with cultivated oat with winter vetch and yellow wild radish also present within the fields.

4.2.4 Ruderal

Ruderal areas throughout the Study Area are characterized by existing dirt roads or other disturbed areas. Ruderal areas were dominated by nonnative grasses and forbs consisting of ripgut brome, foxtail barley, rat-tailed vulpia (*Festuca myuros*), purple wild radish (*Raphanus sativus*), and pineapple weed (*Matricaria discoidea*).

4.3 Potential Waters of the U.S.

A total of 7.548 acres of potential Waters of the U.S. have been mapped within the Study Area during the Aquatic Resources Delineation. Potentially jurisdictional features mapped within the Study Area include vernal pools, seasonal wetlands, seasonal wetland swales, detention basins, and ditch (Table 1 and Figure 2. *Aquatic Resources Delineation*).

Table 1. Potential Waters of the U.S. within the Study Area

Type	Acres[1]
Wetlands	
Vernal Pools	3.467
Seasonal Wetland	0.671
Seasonal Wetland Swale	2.961
Other Waters	
Detention Basin	0.420
Ditch	0.028
Total	**7.548**

[1] Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

4.3.1 Vernal Pool

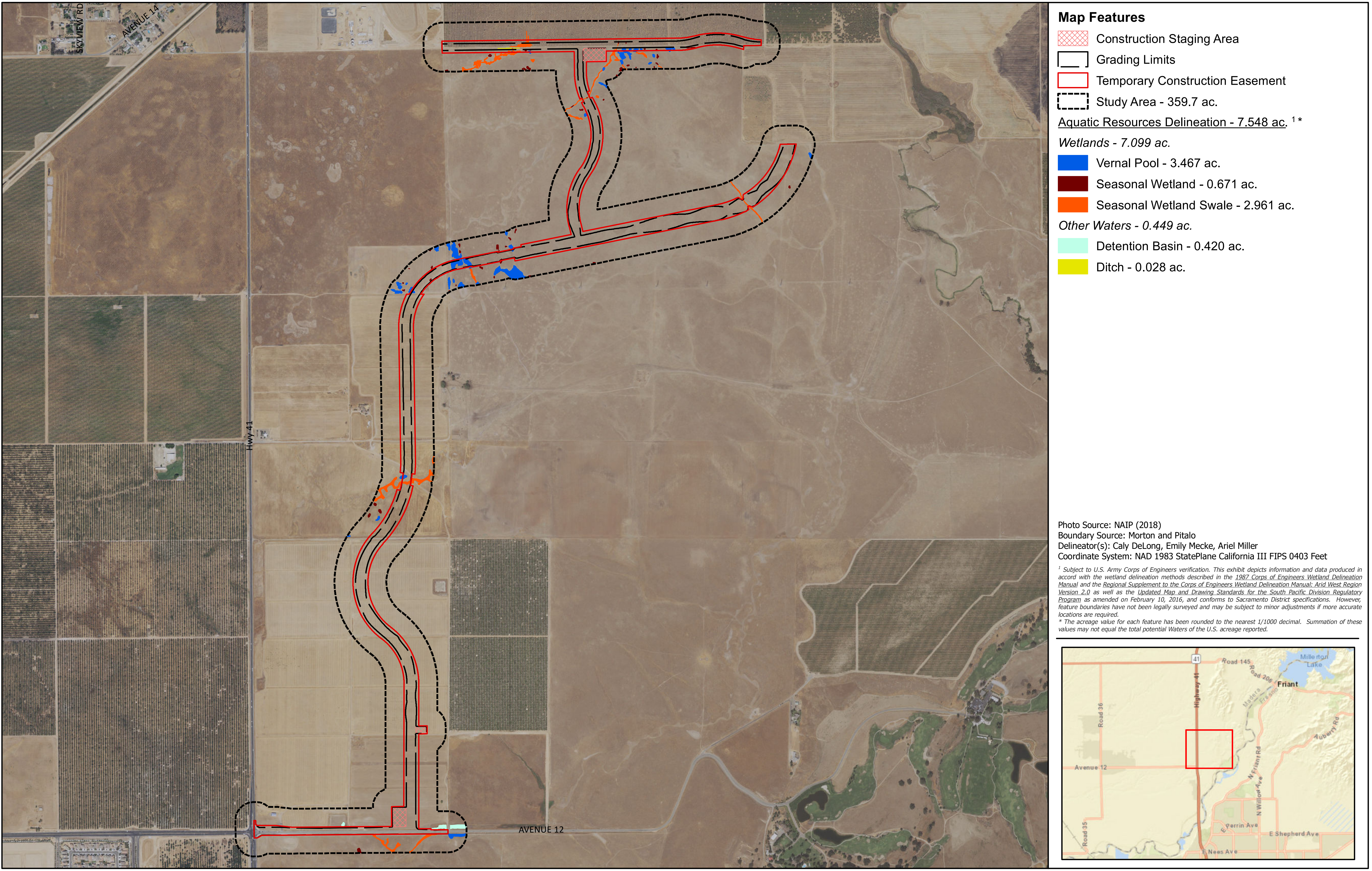
In general, vernal pools are topographic basins underlain with an impermeable or semi-permeable hardpan or duripan layer. Direct rainfall and surface runoff inundate the pools during the wet season. The pools remain inundated and/or the soil maintains saturation through spring and are dry by late spring until the following wet season. Several vernal pools were mapped within the northern and central portions of the Study Area. In general, four main variations in plant composition of vernal pools were observed.

The first type of vernal pool was dominated by creeping spikerush (*Eleocharis macrostachya*), slender popcorn-flower (*Plagiobothrys stipitatus*), and dwarf woolly-heads (*Psilocarphus brevissimus*) with Mediterranean barley dominant on the fringe of vernal pools.

The second type of vernal pool was dominated by slender popcorn-flower, Solano downingia (*Downingia ornatissima*), and hyssop loosestrife (*Lythrum hyssopifolia*).

The third type of vernal pool was dominated by creeping spikerush, slender popcorn-flower, water pygmy-weed (*Crassula aquatica*), and larger water-starwort (*Callitriche heterophylla*).

The fourth type consisted of a few vernal pools that were primarily dominated by least spikerush (*Eleocharis acicularis* var. *acicularis*) with other dominants including slender popcorn-flower and dwarf woolly-heads.



Map Features

▨ Construction Staging Area
☐ Grading Limits
🟥 Temporary Construction Easement
☐ Study Area - 359.7 ac.

Aquatic Resources Delineation - 7.548 ac. [1] *

Wetlands - 7.099 ac.

🟦 Vernal Pool - 3.467 ac.
🟫 Seasonal Wetland - 0.671 ac.
🟧 Seasonal Wetland Swale - 2.961 ac.

Other Waters - 0.449 ac.

🟩 Detention Basin - 0.420 ac.
🟨 Ditch - 0.028 ac.

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

[1] *Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.*

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_401_Overview_20200416.mxd *(JDS)-chinkelman 4/17/2020*

Map Date: 4/17/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 1,000

Figure 2. Aquatic Resources Delineation

2017-089 Rio Mesa Boulevard Road

4.3.2 Seasonal Wetland

Seasonal wetlands are ephemerally wet due to the accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short and seasonal wetlands are commonly dominated by nonnative annual, and sometimes perennial, hydrophytic species. There were several seasonal wetlands mapped throughout the Study Area. Seasonal wetlands were primarily dominated by Mediterranean barley and hyssop loosestrife with toad rush (*Juncus bufonius*).

4.3.3 Seasonal Wetland Swale

Seasonal wetland swales are linear wetland features that do not exhibit an ordinary high water mark (OHWM). These are typically inundated for short periods during and immediately after rain events, but usually maintain soil saturation for longer periods during the wet season. Several seasonal wetland swales were mapped throughout the Study Area. Seasonal wetland swales were primarily dominated by Mediterranean barely with other dominants including slender popcorn-flower, dwarf woolly-heads, button-celery (*Eryngium castrense*), and annual bluegrass (*Poa annua*).

4.3.4 Ditch

Ditches are linear features constructed to convey stormwater and/or irrigation water. Two ditches are present alongside the northern dirt road within the Study Area. These ditches are relatively shallow and display an OHWM. These ditches were primarily dominated by curly dock (*Rumex crispus*) and annual rabbit-foot grass (*Polypogon monspeliensis*).

4.3.5 Detention Basin

Detention basins are depressional and generally isolated features which can be perennial or ephemeral. Three detention basins are present in the southern portion of the Study Area. The detention basins were primarily dominated by Mediterranean barley (*Hordeum marinum*) and button-celery (*Eryngium castrense*).

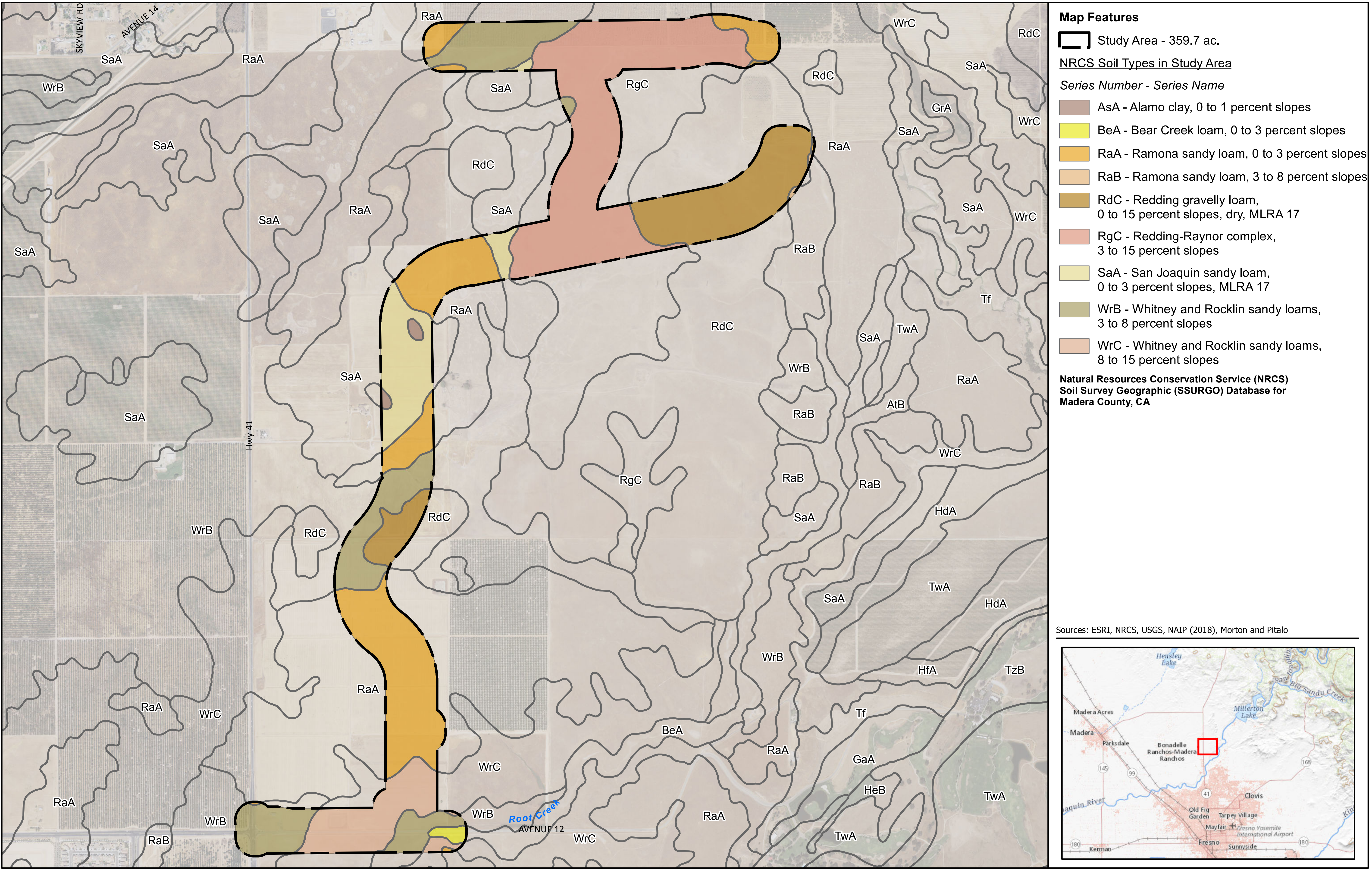
4.4 Soils

According to the Soil Survey Geographic (SSURGO) Database for Madera County, California (NRCS 2017a), eight soil units, or types, have been mapped within the Study Area (Figure 3. *Natural Resources Conservation Service Soil Types*):

- AsA – Alamo clay, 0 to 1 percent slope;
- RaA – Ramona sandy loam, 0 to 3 percent slopes
- RaB – Ramona sandy loam, 3 to 8 percent slopes
- RdC – Redding gravelly loam, 3 to 15 percent slopes
- RgC – Redding-Raynor complex, 3 to 15 percent slopes

- SaA – San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17
- WrB – Whitney and Rocklin sandy loams, 3 to 8 percent slopes
- WrC – Whitney and Rocklin sandy loams, 8 to 15 percent slopes

Alamo clay, 0 to 1 percent slopes (Asa) is partially composed of Alamo, which are considered hydric when occurring in fan remnants. Ramona sandy loam, 0 to 3 percent slopes (RaA) and Romina sandy loam, 3 to 8 percent slopes (RaB) contain unnamed components, which are considered hydric when occurring in depressions. Whitney and Rocklin sandy loams, 3 to 8 percent slopes (WrB) and Whitney and Rocklin sandy loams, 8 to 15 percent slopes (WrC) contain unnamed and ponded components, which are considered hydric when occurring in depressions. None of the remaining soil types contain hydric components (NRCS 2017b).



Map Features

Study Area - 359.7 ac.

NRCS Soil Types in Study Area

Series Number - Series Name

■ AsA - Alamo clay, 0 to 1 percent slopes

■ BeA - Bear Creek loam, 0 to 3 percent slopes

■ RaA - Ramona sandy loam, 0 to 3 percent slopes

■ RaB - Ramona sandy loam, 3 to 8 percent slopes

■ RdC - Redding gravelly loam,
0 to 15 percent slopes, dry, MLRA 17

■ RgC - Redding-Raynor complex,
3 to 15 percent slopes

■ SaA - San Joaquin sandy loam,
0 to 3 percent slopes, MLRA 17

■ WrB - Whitney and Rocklin sandy loams,
3 to 8 percent slopes

■ WrC - Whitney and Rocklin sandy loams,
8 to 15 percent slopes

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for Madera County, CA

Sources: ESRI, NRCS, USGS, NAIP (2018), Morton and Pitalo

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Soils_and_Geology\Soils\RMRA_Soils_V7_20200227_StudyArea.mxd (JDS)-JSwager 2/28/2020

Map Date: 2/28/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 1,000

Figure 3. Natural Resources Conservation Service Soil Types

2017-089 Rio Mesa Boulevard Road Alignment

4.5 Wildlife

Habitats within the Study Area support a variety of common wildlife species such as red-tailed hawk (*Buteo jamaicensis*) and California ground squirrel (*Spermophilus beecheyi*), among others. A detailed list of wildlife species observed in the vicinity of the Study Area during the March and April 2017 site visit is included as Attachment C.

4.6 Evaluation of Species Identified in the Literature Search

A list of all of the plant and wildlife species identified in the literature search as potentially occurring within the Study Area is provided in Table 2. This table includes the listing status for each species, a brief habitat description, and a determination on the potential to occur in the Study Area. Following the table is a brief description of each species with potential to occur within the Study Area.

Several species and sensitive habitat types came up in the database and literature searches (Attachment A) but are not included in Table 2. These species and habitat types were not included in Table 2 because the species have been formally delisted or are only tracked by the CNDDB and possess no special-status, or because the identified sensitive habitats are not located within the Study Area. They are not discussed further in this report.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Plants						
Brassy bryum *(Bryum chryseum)*	-	-	4.3	Chaparral (openings), cismontane woodland, and valley and foothill grassland (164‘- 1,969’).	N/A	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Hoover’s calycadenia *(Calycadenia hooveri)*	-	-	1B.3	Rocky soils in cismontane woodland and valley and foothill grassland (213’ - 984‘).	July - September	Low potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 or 2020.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Succulent owl's clover *(Castilleja campestris* ssp. *succulenta)*	FT, CH	CE	1B.2	Vernal pools that are often acidic. (164' - 2,461').	April - May	Present. Identified during special-status plant surveys completed by ECORP in 2017 and 2019.
California jewelflower *(Caulanthus californicus)*	FE	CE	1B.1	Sandy soils in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland (200' - 3,281').	February - May	Low potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Ewan's larkspur *(Delphinium hansenii* ssp. *ewanianum)*	-	-	4.2	Rocky soils in cismontane woodland and valley and foothill grassland (196' - 1,969').	March - May	Low potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Dwarf downingia *(Downingia pusilla)*	-	-	2B.2	Mesic areas in valley and foothill grassland, and vernal pools. Species appears to have an affinity for slight disturbance (i.e., scraped depressions, ditches, etc.) (Baldwin et al. 2012, CDFW 2017a) (3' - 1,460').	March - May	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Spiny-sepaled button-celery *(Eryngium spinosepalum)*	-	-	1B.2	Vernal pools within valley and foothill grassland (262' - 3,199').	April - June	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
California satintail *(Imperata brevifolia)*	-	-	2B.1	Mesic areas in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and riparian scrub (0' - 3,986').	September - May	Absent. No suitable habitat present onsite.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Munz's tidy-tips (*Layla munzii*)	-	-	1B.2	Alkaline clay soils in chenopod scrub and valley and foothill grasslands (492'–2,297').	March–April	Absent. No suitable habitat present onsite.
Madera leptosiphon *(Leptosiphon serrulatus)*	-	-	1B.2	Cismontane woodland and lower montane coniferous forest (984' - 4,265').	April - May	Absent. No suitable habitat present onsite.
Orange lupine *(Lupinus citrinus* var. *citrinus)*	-	-	1B.2	Granitic soils in chaparral, cismontane woodland, and lower montane coniferous forest (1,246' - 5,577').	April - July	Absent. No suitable habitat present onsite.
Shining navarretia *(Navarretia nigelliformis* ssp. *radians)*	-	-	1B.2	Vernal pools within cismontane woodland and valley or foothill grassland (249' - 3,281').	April - July	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
San Joaquin Valley orcutt grass *(Orcuttia inaequalis)*	FT, CH	CE	1B.1	Vernal pools (33' - 2,477').	April - September	Present. Identified during special-status plant surveys completed by ECORP in 2017 and 2019.
Hairy orcutt grass *(Orcuttia pilosa)*	FE, CH	CE	1B.1	Vernal pools (151' - 656').	May - September	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Hartweg's golden sunburst *(Pseudobahia bahiifolia)*	FE	CE	1B.1	Clay, often acidic soils in cismontane woodland, valley and foothill grasslands (49' - 492').	March - April	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Sanford's arrowhead *(Sagittaria sanfordii)*	-	-	1B.2	Shallow marshes and freshwater swamps (0' - 2,133').	May - November	Absent. No suitable habitat present onsite.
Caper-fruited tropidocarpum *(Tropidocarpum capparideum)*	-	-	1B.1	Alkaline hills in valley and foothill grassland (3' – 1,493').	March - April	Absent. No suitable habitat present onsite.
Greene's tuctoria *(Tuctoria greenei)*	FE	CR	1B.1	Vernal pools (98' - 3,510').	May - December	Potential to occur. Not observed during special-status plant surveys completed by ECORP in 2017, 2019 and 2020.
Invertebrates						
Crotch bumble bee (*Bombus crotchii*)	-	CC	-	Primarily nests underground in open grassland and scrub habitats from the California coast east to the Sierra Cascade and south to Mexico.	March - September	Low Potential to occur.
Conservancy fairy shrimp (*Branchinecta conservatio)*	FE	-	-	Vernal pools/wetlands.	November-April	Absent. This species has a highly restricted range and is not known to occur within 10 miles of the Study Area.
Midvalley fairy shrimp (*Branchinecta mesovallensis)*	-	-	-	Vernal pools/wetlands.	November - April	Potential to occur.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	-	-	Elderberry shrubs.	Any season	Absent. No suitable habitat (elderberry shrubs) present onsite and outside the known range of the species.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	-	-	Vernal pools/wetlands	November-April	Present. There is a CNDDB-documented occurrence of this species within the Study Area. Suitable habitat for this species occurs within the Study Area.
Fish						
Delta smelt (*Hypomesus transpacificus*)	FT	CE	-	Water bodies connected to the Sacramento-San Joaquin delta.	N/A	Absent. No suitable habitat present onsite.
Hardhead (*Mylopharodon conocephalus*)	-	-	SSC	Relatively undisturbed streams at low to mid elevations in the Sacramento-San Joaquin and Russian River drainages. In the San Joaquin River, scattered populations found in tributary streams, but only rarely in the valley reaches of the San Joaquin River.	N/A	Absent. No suitable habitat present onsite.
Amphibians						
California tiger salamander (Central California DPS) (*Ambystoma californiense*)	FT, CH	CT	SSC	Vernal pools, wetlands (breeding) and adjacent grassland or oak woodland; needs underground refuge (e.g., ground squirrel and/or gopher burrows). Largely terrestrial as adults.	March-May	Potential to occur.
Foothill yellow-legged frog (*Rana boylii*)	-	CE	SSC	Foothill yellow-legged frogs can be active all year in warmer locations but may become inactive or hibernate in colder climates. At lower elevations, foothill yellow-legged frogs likely spend most of the year in or near streams. Adult frogs, primarily males, will gather along main-stem rivers during spring to breed.	May - October	Absent. No suitable habitat present onsite and out of the range for this species.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
California red-legged frog (*Rana draytonii*)	FT	-	SSC	Lowlands or foothills at waters with dense shrubby or emergent riparian vegetation. Adults must have aestivation habitat to endure summer dry down.	May 1- November 1	Absent. The Study Area is outside of the range for this species.
Western spadefoot (*Spea hammondii*)	-	-	SSC	California endemic species of vernal pools, swales, wetlands and adjacent grasslands throughout the Central Valley.	March-May	Present. Observed onsite during site visit in 2017.
Reptiles						
Blainville's (Coast) horned lizard (*Phrynosoma blainvillii* formerly *Phrynosoma coronatum frontale*)	-	-	SSC	Formerly a wide-spread horned lizard found in a wide variety of habitats, often in lower elevation areas with sandy washes and scattered low bushes. Also occurs in Sierra Nevada foothills. Needs open areas for basking, but with bushes and shaded areas for cover. A dietary specialist on native ants.	April - October	Low potential to occur.
Blunt-nosed leopard lizard *(Gambelia silus)*	FE	CE	FP	Occurs in sparsely vegetated alkali scrub habitats in the southern San Joaquin Valley. Uses mammal burrows, shrubs and other structures for shade.	April - July	Absent. The Study Area is outside the range for this species.
California glossy snake *(Arizona elegans occidentalis)*			SSC	Coastal dunes, alluvial creek beds, other loose, sandy habitat.	February - March	Absent. The Study Area is outside of the range for this species.
Northern legless lizard (*Anniella pulchra*)	-	-	SSC	The most widespread of California's *Anniella* species. Occurs in sandy or loose soils under sparse vegetation from Antioch south coastally to Ventura. Bush lupine is often an indicator plant, and two melanistic populations are known.	Generally spring, but depends on location and conditions	Absent. No suitable habitat onsite.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Northwestern pond turtle (*Actinemys marmorata*)	-	-	SSC	Requires basking sites and upland habitats up to 0.5 km from water for egg laying. Uses ponds, streams, detention basins, and irrigation ditches.	April – October	Absent. No suitable habitat present onsite.
Giant garter snake (*Thamnophis gigas*)	FT	CT		Freshwater ditches, sloughs, and marshes in the Central Valley. Almost extirpated from the southern parts of its range.	April - October	Absent. No suitable habitat present onsite.
Birds						
Clark's grebe (*Aechmophorus clarkii*)	-	-	BCC	Winters on salt or brackish bays, estuaries, sheltered sea coasts, freshwater lakes, and rivers. Breeds on freshwater to brackish marshes, lakes, reservoirs and ponds, with a preference for large stretches of open water fringed with emergent vegetation.	June-August (breeding)	Absent. No suitable habitat present onsite.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	-	-	BCC, SSC	Breeds in salt marshes of San Francisco Bay; winters San Francisco south along coast to San Diego Co.	March-July	Absent. Outside of the known range for this species.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Lawrence's goldfinch (*Carduelis lawrencei*)	-	-	BCC	Breeds in Sierra Nevada and inner Coast Range foothills surrounding the Central Valley and the southern Coast Range to Santa Barbara County east through southern California to the Mojave Desert and Colorado Desert into the Peninsular Range. Nests in arid and open woodlands with chaparral or other brushy areas, tall annual weed fields, and a water source (e.g. small stream, pond, lake), and to a lesser extent riparian woodland, coastal scrub, evergreen forests, pinyon-juniper woodland, planted conifers, and ranches or rural residences near weedy fields and water.	March-September	Absent. No suitable habitat present onsite.
Short-billed dowitcher (*Limnodromus griseus*)	-	-	BCC	Nests in Canada, southern Alaska; winters in coastal California south to South America; wintering habitat includes coastal mudflats and brackish lagoons	Wintering/migrant period: late-August-May	Absent. No suitable habitat present onsite.
Song sparrow "Modesto" (*Melospiza melodia heermanni*)	-	-	BCC, SSC	Resident in central and southwest California, including Central Valley; nests in marsh, scrub habitat.	April-June	Absent. No suitable habitat present onsite.
San Clemente spotted towhee (*Pipilo maculatus clementae*)	-	-	BCC, SSC	Resident on Santa Catalina and Santa Rosa Islands; extirpated on San Clemente Island, California. Breeds in dense, broadleaf shrubby brush, thickets, and tangles in chaparral, oak woodland, island woodland, and Bishop pine forest.	Year round resident; breeding season is April-July	Absent. Outside of the known range for this species.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
California thrasher (*Toxostoma redivivum*)	-	-	BCC	Resident and endemic to coastal and Sierra Nevada-Cascade foothill areas of California. Nests are usually well hidden in dense shrubs, including scrub oak, California lilac, and chamise.	February-July	Absent. No suitable habitat present onsite.
Wrentit (*Chamaea fasciata*)	-	-	BCC	Coastal sage scrub, northern coastal scrub, chaparral, dense understory of riparian woodlands, riparian scrub, coyote brush and blackberry thickets, and dense thickets in suburban parks and gardens.	March-August	Absent. No suitable habitat present onsite.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT	CE	BCC	Breeds in California, Arizona, Utah, Colorado, and Wyoming. In California, they nest along the upper Sacramento River and the South Fork Kern River from Isabella Reservoir to Canebrake Ecological Reserve. Other known nesting locations include Feather River (Butte, Yuba, Sutter counties), Prado Flood Control Basin (San Bernadine and Riverside Co.), Amargosa River and Owens Valley (Inyo County), Santa Clara River (Los Angeles County), Mojave River and Colorado River (San Bernardino County). Nests in riparian woodland. Winters in South America.	June 15-August 15	Absent. No suitable habitat present onsite.
Costa's hummingbird (*Calypte costae*)	-	-	BCC	In California, breeds in coastal scrub and chaparral communities from Santa Barbara County south into Baja California; from Mexico north into Mojave desert scrub of Eastern Sierra Nevada.	February-June	Absent. No suitable habitat present onsite and outside the known range for this species.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Rufous hummingbird (nesting) *(Selasphorus rufus)*	-	-	BCC	Breeds in extreme northwestern California north into British Columbia and Alaska. Winters in coastal Southern California south into Mexico. Nesting habitat includes secondary succession communities and openings, mature forests, parks and residential areas.	April-July	Absent. No suitable habitat present onsite and outside the known range for this species.
Long-billed curlew (wintering) (*Numenius americanus*)	-	-	BCC, WL	Breeds east of the Cascades in Washington, Oregon, northeastern California (Siskiyou, Modoc, Lassen counties), east-central California (Inyo County), through Great Basin region into Great Plains. Winters in California, Texas, and Louisiana. Wintering habitat includes tidal mudflats and estuaries, wet pastures, sandy beaches, salt marsh, managed wetlands, evaporation ponds, sewage ponds, and grasslands.	September-March (wintering)	Potential to winter onsite.
Bald eagle (nesting and wintering) (*Haliaeetus leucocephalus)*	De-listed	CE	CFP, BCC	Typically nests in forested areas near large bodies of water in the northern half of California; nest in trees and rarely on cliffs; wintering habitat includes forest and woodland communities near water bodies (e.g. rivers, lakes), wetlands, flooded agricultural fields, open grasslands	February – September (nesting); October-March (wintering)	Absent. No suitable habitat present onsite.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status¹			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Swainson's hawk (nesting) *(Buteo swainsoni)*	-	CT	BCC	Nesting occurs in trees in agricultural, riparian, oak woodland, scrub, and urban landscapes. Forages over grassland, agricultural lands, particularly during disking/harvesting, irrigated pastures	March-August	Potential to occur (nest) onsite. Observed flying overhead during site visits in 2017.
Golden eagle (nesting and wintering) (*Aquila chrysaetos*)	-	-	BCC, FP	Nesting habitat includes mountainous canyon land, rimrock terrain of open desert and grasslands, riparian, oak woodland/savannah, and chaparral. Nesting occurs on cliff ledges, river banks, trees, and human-made structures (e.g. windmills, platforms, and transmission towers). Breeding occurs throughout California, except the immediate coast, Central Valley floor, Salton Sea region, and the Colorado River region, where they can be found during Winter.	Nest (February-August); winter CV (October-February)	Potential to occur (nest) onsite. Observed flying overhead during site visits in 2017.
Burrowing owl (burrow sites) *(Athene cunicularia)*	-	-	BCC, SSC	Breeds in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds.	February-August	Potential to occur (nest) onsite.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Lewis' woodpecker (nesting) (*Melanerpes lewis*)	-	-	BCC	In California, breeds in Siskiyou and Modoc Counties, Warmer Mountains, inner coast ranges from Tehama to San Luis Obispo Counties, San Bernardino Mountains, and Big Pine Mountain (Inyo County); nesting habitat includes open ponderosa pine forest, open riparian woodland, logged/burned forest, and oak woodlands. Does not breed on the west side of Sierran crest (Beedy and Pandalfino 2013).	April-September (breeding); September-March (winter in Central Valley).	Absent. No suitable habitat present onsite.
Nuttall's woodpecker *Picoides nuttallii*	-	-	BCC	Resident from northern California south to Baja California. Nests in tree cavities in oak woodlands and riparian woodlands.	April-July	Absent. No suitable habitat present onsite.
Least Bell's vireo (nesting) (*Vireo bellii pusillus*)	FE	CE	BCC	In California, breeding range includes Ventura, Los Angeles, Riverside, Orange, San Diego, and San Bernardino counties, and rarely Stanislaus and Santa Clara counties. Nesting habitat includes dense, low shrubby vegetation in riparian areas, brushy fields, young second-growth woodland, scrub oak, coastal chaparral and mesquite brushland. Winters in southern Baja California Sur.	April 1-July 31	Absent. No suitable habitat present onsite.
Oak titmouse (*Baeolophus inornatus*)	-	-	BCC	Nests in tree cavities within dry oak or oak-pine woodland and riparian; where oaks are absent, they nest in juniper woodland, open forests (gray, Jeffrey, Coulter, pinyon pines and Joshua tree)	March-July	Absent. No suitable habitat present onsite.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
Tricolored blackbird (nesting colony) (*Agelaius tricolor*)	-	CT	BCC, SSC	Breeds locally west of Cascade-Sierra Nevada and southeastern deserts from Humboldt and Shasta Cos south to San Bernardino, Riverside and San Diego Counties. Central California, Sierra Nevada foothills and Central Valley, Siskiyou, Modoc and Lassen Counties. Nests colonially in freshwater marsh, blackberry bramble, milk thistle, triticale fields, weedy (mustard, mallow) fields, giant cane, safflower, stinging nettles, tamarisk, riparian scrublands and forests, fiddleneck and fava bean fields.	March-August	Potential to forage onsite. Observed within vicinity of Study Area during site visit in 2017.
Mammals						
American badger (*Taxidea taxus*)	-	-	SSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils.	Any season	Potential to occur.
Fresno kangaroo rat *(Dipodomys nitratoides exilis)*	FE	CE	-	Alkali desert scrub.	Any season	Absent. No suitable habitat present onsite.
Pallid bat (*Antrozous pallidus*)	-	-	SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (Western Bat Working Group [WBWG] 2017).	April-September	Potential to occur.

Table 2. Potentially Occurring Special-Status Species

Common Name (Scientific Name)	Status[1]			Habitat Description	Survey Period	Potential to Occur Onsite
	FESA	CESA/ NPPA	Other			
San Joaquin kit fox *(Vulpes macrotis mutica)*	FE	CT	-	Grasslands, sagebrush scrub.	April 15 - July 15, September 1 - December 1	Low potential to occur.
Spotted bat *(Euderma maculatum)*	-	-	SSC	Roost in cracks, crevices, and caves, usually high in fractured rock cliffs. Found in desert, sub-alpine meadows, desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pastures (WBWG 2017).	April-September	Low potential to occur.
Western mastiff bat (*Eumops perotis californicus*)	-	-	SSC	Primarily a cliff-dwelling species, found in similar crevices in large boulders and buildings (WBWG 2017).	April-September	Absent. No suitable habitat present onsite.

Status Codes[1]:

FE	ESA listed, Endangered.
FT	ESA listed, Threatened.
FC	Candidate for ESA listing as Threatened or Endangered.
FP	CDFW Fully Protected
WL	CDFW Watch List
CE	CESA or NPPA listed, Endangered.
CT	CESA or NPPA listed, Threatened.
CR	CESA or NPPA listed, Rare.
CC	Candidate for CESA listing as Threatened or Endangered
CFP	California Fish and Game Code Fully Protected Species (§ 3511-birds, § 4700-mammals, § 5050-reptiles/amphibians).
CH	Critical habitat for the species is mapped within the Study Area.
SSC	CDFW Species of Special Concern
BCC	USFWS Bird of Conservation Concern
1B	CRPR /Rare or Endangered in California and elsewhere.
2B	CRPR /Rare or Endangered in California, more common elsewhere.
4	CRPR /Plants of Limited Distribution - A Watch List.
0.1	Threat Rank/Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2	Threat Rank/Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3	Threat Rank/Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

[2] According to species-specific occurrences of dwarf downingia in the CNDDB, the species has been documented in man-made features such as tire ruts, scraped depressions, stock ponds, and roadside ditches (CDFW 2017a).

4.6.1 Plants

The majority of the Study Area was surveyed by early and late season surveys in 2017, 2019, or 2020. Only a small area in the southern portion of the Study Area has not been surveyed for early or late season special-status plants. The grading limits of the Project avoid this portion of the Study Area. The results of these surveys are discussed in the descriptions of the plant species below.

A total of 18 special-status plant species were identified as having the potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, six species were determined to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of these species is provided in this analysis. A brief description of the remaining 12 species that have the potential to occur within the Study Area are presented below.

Brassy Bryum

Brassy bryum (*Bryum chryseum*) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 4.3 species. This species is a moss that occurs in openings in chaparral, cismontane woodland, and valley and foothill grassland (CNPS 2019). Brassy bryum is known to occur at elevations ranging from 164 to 1,969 feet above MSL (CNPS 2019). The current range of this species in California includes Amador, Butte, Fresno, Madera, and Mendocino counties (CNPS 2019).

While there are no CNDDB documented occurrences of brassy bryum within five miles of the Study Area (CDFW 2019), the annual grassland within the Study Area provides suitable habitat for this species. Brassy bryum has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

Hoover's Calycadenia

Hoover's calycadenia (*Calycadenia hooveri*) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 1B.3 species. This plant is an herbaceous annual that occurs in rocky soils in cismontane woodland and Valley and foothill grassland (CNPS 2019). Hoover's calycadenia blooms from July through September and is known to occur at elevations ranging from 213 to 984 feet above MSL (CNPS 2019). Hoover's calycadenia is endemic to California; the current range for this species includes Calaveras, Madera, Merced, Mariposa, and Stanislaus counties (CNPS 2019).

While there are no CNDDB documented occurrences of Hoover's calycadenia within five miles of the Study Area (CDFW 2019), the annual grassland onsite provides marginally suitable habitat for this species. Hoover's calycadenia has low potential to occur onsite. This species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

Succulent Owl's Clover

Succulent owl's clover (*Castilleja campestris* ssp. *succulenta*) is listed as threatened pursuant to the federal ESA, endangered pursuant to the California ESA, and is designated as a CRPR 1B.2 species. This species is a hemiparasitic herbaceous annual that occurs in vernal pools that are often acidic (CNPS 2019). Succulent owl's clover blooms from April to May, and it is known to occur at elevations ranging from 164 to 2,461 feet above MSL (CNPS 2019). Succulent owl's clover is endemic to California; the current range of this species includes Fresno, Madera, Merced, Mariposa, San Joaquin, and Stanislaus counties (CNPS 2019).

There are nine CNDDB documented occurrences of succulent owl's clover within five miles of the Study Area (CDFW 2019a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the Study Area (CDFW 2017b; USFWS 2017b). Succulent owl's clover is present within the Study Area and was identified in four vernal pools within the Study Area during surveys conducted in 2017 and 2019 (Figure 4. *Special-Status Plant Survey Results*). Succulent owl's clover is present onsite.

California Jewelflower

California jewelflower (*Caulanthus californicus*) is listed as endangered pursuant to both the federal ESA and California ESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland on sandy soils (CNPS 2019). California jewelflower blooms from February to May, and it is known to occur at elevations ranging from 200 to 3,281 feet above MSL (CNPS 2019). California jewelflower is endemic to California; the current range of this species includes Fresno, Kern, Kings, Santa Barbara, San Luis Obispo, and Tulare counties. This species is believed to be extirpated from Kings and Tulare counties (CNPS 2019).

While there are no CNDDB documented occurrences of California jewelflower within five miles of the Study Area (CDFW 2019), the annual grassland within the Study Area provides marginally suitable habitat for this species. California jewelflower has low potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

There is no critical habitat for this species mapped within Study Area.

Ewan's Larkspur

Ewan's larkspur (Delphinium hansenii ssp. ewanianum) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 4.2 species. This species is an herbaceous perennial that occurs in rocky cismontane woodland and valley and foothill grassland (CNPS 2019). Ewan's larkspur blooms between March and May and is known to occur at elevations ranging from 197 to 1,969 feet above MSL (CNPS 2019). Ewan's larkspur is endemic to California; its current range includes Calaveras, Fresno, Kern, Madero, Merced, and Tulare counties (CNPS 2019).

While there are no CNDDB documented occurrences of Ewan's larkspur within five miles of the Study Area (CDFW 2019), the annual grassland within the Study Area provides marginally suitable habitat for this species. Ewan's larkspur has low potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

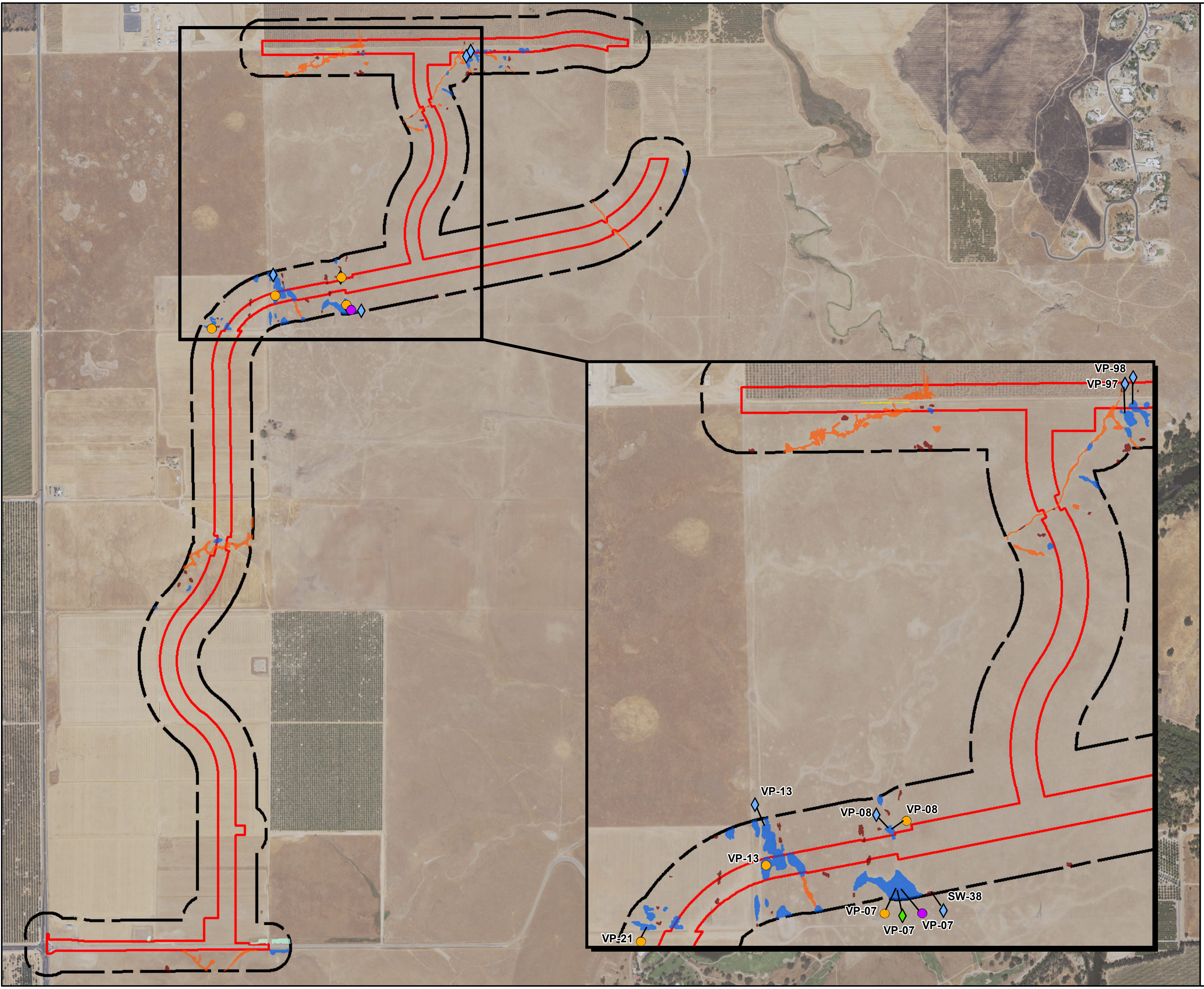


Figure 4. Special-Status Plant Survey Results

Map Features

🟥 Temporary Construction Easement

▭ Study Area

Special-Status Plants

2017

● *Castilleja campestris* ssp. *succulenta*

● *Orcuttia inaequalis*

2019

◆ *Castilleja campestris* ssp. *succulenta*

◆ *Orcuttia inaequalis*

Aquatic Resources Delineation [1]

Wetlands

🟦 Vernal Pool

🟫 Seasonal Wetland

🟧 Seasonal Wetland Swale

Other Waters

🟩 Detention Basin

🟨 Ditch

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Road Alignment

Photo Source: NAIP (2018)

Map Date: 4/16/2020

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\SSS_Survey_and_Mapping\Botanics\RMRA_RarePlant_BRA_20200416.mxd(CCH) -chinkelman 4/16/2020

Dwarf Downingia

Dwarf downingia (*Downingia pusilla*) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 2B.2 species. This species is an herbaceous annual that occurs in vernal pools and mesic areas in Valley and foothill grasslands (CNPS 2019). Dwarf downingia also appears to have an affinity for slight disturbance since it has been found in manmade features such as tire ruts, scraped depressions, stock ponds, and roadside ditches (Baldwin et al. 2012; CDFW 2019). This species blooms from March through May and is known to occur at elevations ranging from 3 to 1,460 feet above MSL (CNPS 2019). The current range of this species in California includes Amador, Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties (CNPS 2019).

There is one documented occurrence of dwarf downingia within five miles of the Study Area (CDFW 2019). The vernal pools and seasonal wetlands onsite provide suitable habitat for this species. Dwarf downingia has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

Spiny-Sepaled Button-Celery

Spiny-sepaled button-celery (*Eryngium spinosepalum*) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 1B.2 species. This species is an herbaceous annual/perennial that occurs in Valley and foothill grassland and vernal pools (CNPS 2019). Spiny-sepaled button-celery blooms from April through June and is known to occur at elevations ranging from 262 to 3,199 feet above MSL (CNPS 2019). Spiny-sepaled button-celery is endemic to California; the current range of this species includes Contra Costa, Fresno, Kern, Madera, Merced, San Luis Obispo, Stanislaus, Tulare, and Tuolumne counties (CNPS 2019).

There are four CNDDB documented occurrences of spiny-sepaled button-celery within five miles of the Study Area (CDFW 2017a). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provides suitable habitat for this species. Spiny-sepaled button celery has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

Shining Navarretia

Shining navarretia (*Navarretia nigelliformis* ssp. *radians*) is not listed pursuant to either the federal ESA or California ESA but is designated as a CRPR 1B.2 species. This species is an herbaceous annual that occurs in cismontane woodland, valley and foothill grassland, and vernal pools, sometimes in clayey soils (CNPS 2019). Shining navarretia blooms between April and July and is known to occur at elevations ranging from 213 to 3,281 feet above MSL (CNPS 2019). Shining navarretia is endemic to California; its current range includes Alameda, Contra Costa, Colusa, Fresno, Madera, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Stanislaus, and Tulare counties (CNPS 2019).

While there are no CNDDB documented occurrences of shining navarretia within five miles of the Study Area (CDFW 2019), the vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area may provide suitable habitat for this species. Shining navarretia has potential to occur onsite. However, this species was not detected during special-status plant surveys conducted in 2017, 2019, or 2020.

San Joaquin Valley Orcutt Grass

San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) is listed as threatened pursuant to the federal ESA, listed as endangered pursuant to the California ESA, and designated as a CRPR 1B.1 species. This herbaceous annual occurs on acidic soils that vary in texture from clay to sandy loam in vernal pools (CNPS 2019; CDFG 2005). San Joaquin Valley Orcutt grass blooms from April through September and is known to occur at elevations ranging from 33 to 2,477 feet above MSL (CNPS 2019). San Joaquin Valley Orcutt grass is endemic to California; the current range of this species includes Fresno, Madera, Merced, Solano, Stanislaus, and Tulare counties, and is likely extirpated from Stanislaus County (CNPS 2019).

There are seven CNDDB occurrences of San Joaquin Valley Orcutt grass within five miles of the Study Area (CDFW 2019). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the study area (CDFW 2017b; USFWS 2017). San Joaquin Valley Orcutt grass is present within the Study Area and was identified in one vernal pool within the Study Area during surveys conducted in 2017 (see Figure 4). San Joaquin Valley Orcutt grass is present onsite.

Hairy Orcutt Grass

Hairy Orcutt grass (*Orcuttia pilosa*) is listed endangered pursuant to both the federal ESA and California ESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in vernal pools (CNPS 2019). Hairy Orcutt grass blooms from May through September and is known to occur at elevations ranging from 151 to 656 feet above MSL (CNPS 2019). Hairy Orcutt grass is endemic to California; the current range of this species includes Butte, Glenn, Madera, Merced, Stanislaus, and Tehama counties (CNPS 2019).

There are three CNDDB documented occurrences of hairy Orcutt grass within five miles of the Study Area (CDFW 2019). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Additionally, critical habitat for this species has been mapped within the study area (CDFW 2017; USFWS 2017). Hairy Orcutt grass has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

Hartweg's Golden Sunburst

Hartweg's golden sunburst (*Pseudobahia bahiifolia*) is listed as endangered pursuant to both the federal ESA and California ESA and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs on clay soils that are often acidic in cismontane woodlands, and valley and foothill grasslands (CNPS 2019). Hartweg's golden sunburst blooms from March to April and is known to occur at elevations ranging from 49 to 492 feet above MSL (CNPS 2019). Hartweg's golden sunburst is endemic to California;

the current range of this species includes Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties (CNPS 2019). This species is believed to be extirpated from Yuba County (CNPS 2019).

There are five CNDDB documented occurrences of Hartweg's golden sunburst within five miles of the Study Area (CDFW 2019). The annual grassland within the Study Area provides suitable habitat for this species. Hartweg's golden sunburst has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.There is no critical habitat for this species mapped within Study Area.

Greene's Tuctoria

Greene's tuctoria (*Tuctoria greenei*) is listed endangered pursuant to the federal ESA, is listed as rare pursuant to the California ESA, and is designated as a CRPR 1B.1 species. This species is an herbaceous annual that occurs in vernal pools (CNPS 2019). Greene's tuctoria blooms from May through July and is known to occur at elevations ranging from 98 to 3,510 feet above MSL (CNPS 2019). Greene's tuctoria is endemic to California; the current range of this species includes Butte, Fresno, Glenn, Madera, Merced, Modoc, Shasta, San Joaquin, Stanislaus, Tehama, and Tulare counties (CNPS 2019). It is considered extirpated from Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties (CNPS 2019).

While there are no CNDDB documented occurrences of Greene's tuctoria within five miles of the Study Area (CDFW 2019), the vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Greene's tuctoria has potential to occur onsite. However, this species was not found during special-status plant surveys conducted in 2017, 2019, or 2020.

4.6.2 Invertebrates

Five special-status invertebrate species were identified as having potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, two species were determined to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of these species is provided in this analysis. Brief descriptions of the remaining three species that have the potential to occur within the Study Area are presented below.

Crotch Bumble Bee

Crotch bumble bee (*Bombus crotchii*) is a candidate for listing as endangered under California ESA. The historic range of the Crotch bumble bee extends from coastal areas east to the edges of the desert in central California south to Baja California del Norte, Mexico, excluding mountainous areas (Thorpe et al. 1983, Williams et al. 2014). The species was historically common throughout the southern two-thirds of its range but is now largely absent from much of that area and is nearly extirpated from the center of its historic range, the Central Valley (Hatfield et al. 2014).

The Crotch bumble bee inhabits open grassland and scrub habitats (Williams et al. 2014). The species visits a wide variety of flowering plants, although its very short tongue makes it best suited to forage at open flowers with short corollas (Xerxes Society 2018). Plant families most commonly associated with Crotch bumble bee include Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae (Xerxes

Society 2018). The species primarily nests underground (Williams et al. 2014). Little is known about overwintering sites for the species, but bumble bees generally overwinter in soft, disturbed soils or under leaf litter or other debris (Goulson 2010, Williams et al. 2014). The flight period for Crotch bumble bee queens in California is from late February to late October, peaking in early April with a second pulse in July (Thorp et al. 1983). The flight period for workers and males is California is from late March through September with peak abundance in early July (Thorp et al. 1983).

There are three CNDDB documented occurrences in the vicinity of the Project; however, the locations are imprecise and two of the occurrences date back to 1899; the most recent occurrence was in 1982. Therefore, is considered unlikely, though possible, that this species will occur. The undisturbed grassland onsite provides potential habitat for this species. Crotch bumble bee has low potential to occur onsite.

Midvalley Fairy Shrimp

Midvalley fairy shrimp (*Branchinecta mesovallensis*) is not listed pursuant to either the federal ESA or California ESA, but occurrences of this species are tracked by the CNDDB. This species was proposed for listing under the federal ESA and was denied. However, midvalley fairy shrimp has limited distribution and qualifies as a CEQA special-status species. Midvalley fairy shrimp was formally described as a species in 2000 (Belk and Fugate 2000). This species typically occurs in small, shallow vernal pools, swales, and various artificial ephemeral wetland types (e.g., roadside puddles, scrapes and ditches, and railroad toe-drain pools) (Belk and Fugate 2000, USFWS 2004). Midvalley fairy shrimp have been collected from late January to early April (Eriksen and Belk 1999). The cysts typically hatch in the first week of pool filling if water temperatures are near 10˚C (50˚F) (Eriksen and Belk 1999). This species has been documented in several California counties including Sacramento, Solano, Contra Costa, San Joaquin, Madera, Merced, Fresno, and Yolo (Belk and Fugate 2000 and USFWS 2004).

There are two CNDDB documented occurrences of midvalley fairy shrimp within five miles of the Study Area (CDFW 2019). The vernal pools, seasonal wetlands, and seasonal wetland swales within the Study Area provide suitable habitat for this species. Midvalley fairy shrimp has potential to occur onsite.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (*Branchinecta lynchi*) is listed as threatened pursuant to the federal ESA. Vernal pool fairy shrimp may occur in seasonal ponds, vernal pools, and swales during the wet season, which generally occurs from December through May. This species can be found in a variety of pool sizes, ranging from less than 0.001 acre to over 24.5 acres (Eriksen and Belk 1999). The shrimp hatch from cysts when colder water (10˚C [50˚F] or less) fills the pool and mature in as few as 18 days, under optimal conditions (Eriksen and Belk 1999). At maturity, mating takes place and cysts are dropped. Vernal pool fairy shrimp occur in disjunct patches dispersed across California's Central Valley from Shasta County to Tulare County, the central and southern Coast Ranges from northern Solano County to Ventura County, and three areas in Riverside County (USFWS 2003).

There are two CNDDB documented occurrences of vernal pool fairy shrimp within the Study Area and several additional documented occurrences within five miles of the Study Area (CDFW 2019). The vernal pools, seasonal wetlands, and seasonal wetland swales provide suitable habitat for this species. Because of the two CNDDB documented occurrences within the Study Area and suitable habitat is present, vernal pool fairy shrimp is considered to be present onsite.

There is no critical habitat for this species mapped within Study Area.

4.6.3 Fish

Two special-status fish species were identified as having potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, both species were determined to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of these species is provided in this analysis.

4.6.4 Amphibians

A total of four special-status amphibians were identified as having potential to occur within Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, two species were determined to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of that species is provided in this analysis. A brief description of the remaining two species that have the potential to occur within the Study Area are presented below.

California Tiger Salamander

The Central Valley Discreet Population Segment (DPS) of California tiger salamander (*Ambystoma californiense*) was listed as threatened by USFWS on August 4, 2004 (Federal Register Vol. 69, No. 149: 47212). The Santa Barbara County and Sonoma County DPS', both of which are disjunct from the larger range of the salamander, are federally listed as endangered. As of August 19, 2010, the California tiger salamander is listed as a threatened species under the California ESA throughout its range. Populations at the north and south edges of the historical distribution are extirpated; many populations within the interior of the range have been lost, and abundance has been reduced in many areas. Necessary habitat components for California tiger salamanders include intact open terrestrial landscapes used by adults for most of their life history, and ponded aquatic features where reproduction occurs. California tiger salamanders spend most of their adult life within terrestrial subterranean refuges such as California ground squirrel or Botta's pocket gopher (*Thomomys bottae*) burrows (Stebbins 1972, Laredo et al. 1996). Foraging takes place within these subterranean refugia and out in the open at night or during rains. Suitable breeding sites include vernal pools, seasonal wetlands, stock ponds, or, rarely, slow-moving streams. They may use permanent man-made ponds if predatory species (e.g., fish, crayfish) are absent. California tiger salamanders are endemic to California's Central Valley from Yolo County south to Kern County, and from Santa Barbara County north through the inner coast range to Sonoma County (USFWS 2015).

There is one CNDDB documented occurrence of California tiger salamander onsite and several occurrences within five miles of the Study Area (CDFW 2019). The vernal pools and seasonal wetlands provide suitable breeding habitat and the annual grassland provides suitable dispersal habitat for this species. Additionally, critical habitat for this species is mapped within the Study Area (CDFW 2017). Because there is one CNDDB documented occurrence with the Study Area, critical habitat is mapped, and suitable habitat is present, California tiger salamander is considered to be present onsite.

Western Spadefoot

Western spadefoot (*Spea hammondii*) is not listed pursuant to either the federal ESA or California ESA; however, it is designated as a CDFW SSC. Necessary habitat components of the western spadefoot include loose, friable soils in which to burrow in upland habitats and breeding ponds. Breeding sites include temporary rain pools such as vernal pools and seasonal wetlands, or pools within portions of intermittent drainages (Jennings and Hayes 1994). Western spadefoots spend most of their adult life within underground burrows or other suitable refugia, such as rodent burrows. In California, western spadefoots are known to occur from the Redding area and Shasta County southward to northwestern Baja California at elevations below 4,475 feet (Jennings and Hayes 1994).

There is a CNDDB documented occurrence of western spadefoot onsite and several occurrences within five miles of the Study Area (CDFW 2019). Additionally, western spadefoot was observed in one of the vernal pools during the April 2017 reconnaissance visit. The vernal pools and seasonal wetlands provide suitable habitat for this species. Western spadefoot is present onsite.

4.6.5 Reptiles

A total of six special-status reptile species were identified as having potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, five were determined to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of these species is provided in this analysis. A brief description of the remaining species is provided below.

Blainville's Horned Lizard

Blainville's horned lizard (*Phrynosoma blainvillii*) is considered an SSC by CDFW. This species is a relatively large (to 105 millimeters [mm] in snout-vent length) dorsoventrally flattened, rounded lizard found historically from Redding, California to Baja, Mexico (Jennings and Hayes 1994). Formally considered the coast horned lizard (*P. coronatum*), the species has gone through a long period of taxonomic instability (Jennings and Hayes 1994; Montanucci 2004; Leaché et al. 2009). This diurnal species can occur within a variety of habitats including scrubland, annual grassland, valley-foothill woodlands, and coniferous forests, although it is most common along lowland desert sandy washes and chaparral (Stebbins 2003). In the Coast Ranges, it occurs from Sonoma County south into Baja California (CDFG 1988). It occurs from sea level to 8,000 feet above MSL and an isolated population occurs in Siskiyou County (Stebbins 2003).

Like all horned lizards, Blainville's horned lizard is adorned with pointed and keeled scales, head spines, and parallel lateral fringes of scales, all of which serve to dissuade predators and aid in crypsis (Sherbrooke 2003). This is a ground-dwelling lizard that does not use vertical structures except where they shade the ground (Stebbins and McGinnis 2012).

Blainville's horned lizard is found in open microhabitats such as sandy washes with scattered shrubs or firebreaks in chaparral, where they forage for ants, small beetles and other insects (Jennings and Hayes 1994). Horned lizards (*Phrynosoma*) are native ant specialists and daily activities are centered on aboveground activity patterns of ants, with lizards active generally in mornings and later in the afternoon in the summer. They usually emerge from hibernation in March or April, and are active until September or later. Mating takes place in April through early May (Jennings and Hayes 1994), and an average of 12 (but up to 21) eggs are laid from April to June (Stebbins and McGinnis 2012). Hatchlings 25–27 mm in length emerge from July through September (Stebbins and McGinnis 2012). Periods of daily or seasonal inactivity are spent within rodent burrows or underneath the soil or surface objects (CDFG 1988).

There is one historic CNDDB documented occurrence within five miles of the Study Area (CDFW 2017a). The annual grassland within the Study Area provides marginally suitable habitat for this species. Blainville's horned lizard has low potential to occur onsite.

4.6.6 Birds

A total of 21 special-status bird species were identified as having potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, 16 species were considered to be absent from the Study Area due to the lack of suitable habitat (Table 2). No further discussion of these species is provided in this analysis. A brief description of the remaining five special-status bird species that have the potential to occur within the Study Area is presented below.

Long-Billed Curlew

Long-billed curlew (*Numenius americanus*) is not listed in accordance with either the federal ESA or California ESA but is designated as a BCC by USFWS and a CDFW watch list species. The breeding range of this species includes the Great Plains, Great Basin and intermontane valleys of the western U.S. and southwestern Canada (Dugger and Dugger 2002). In the U.S., their wintering range includes California, Louisiana, and Texas. Winter foraging habitat includes rice fields (flooded and unflooded), managed wetlands, evaporation ponds, sewage ponds, and grasslands (Dugger and Dugger 2002). Long-billed curlew do not nest in the region but may occasionally forage within grassland communities (or wetlands and agricultural fields) during winter.

There are no CNDDB documented occurrences of long-billed curlew within five miles of the Study Area (CDFW 2019); however, the annual grassland provides suitable foraging habitat onsite. Long-billed curlew has potential to winter onsite.

Swainson's Hawk

Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species and is protected pursuant to California ESA. This species nests in North America (Canada, western United States, and Mexico) and typically winters from South America north to Mexico. However, a small population has been observed wintering in the Sacramento-San Joaquin River Delta (Bechard et al. 2010). In California, the nesting season for Swainson's hawk ranges from mid-March to late August.

Swainson's hawk nests within tall trees in a variety of wooded communities including riparian, oak woodland, roadside landscape corridors, urban areas, and agricultural areas, among others. Foraging habitat includes open grassland, savannah, low-cover row crop fields, and livestock pastures. In the Central Valley, Swainson's hawks typically feed on a combination of California vole (*Microtus californicus*), California ground squirrel, ring-necked pheasant (*Phasianus colchicus*), many passerine birds, and grasshoppers (*Melanopulus* species). Swainson's hawks are opportunistic foragers and will readily forage in association with agricultural mowing, harvesting, discing, and irrigating (Estep 1989). The removal of vegetative cover by such farming activities results in more readily available prey items for this species.

There is one CNDDB documented occurrence of Swainson's hawk within five miles of the Study Area (CDFW 2019), and the transmission towers, orchard, annual grassland, and agricultural areas provide suitable habitat for this species. Swainson's hawk has potential to nest and forage onsite.

Golden Eagle

Golden eagle (*Aquila chrysaetos*) is not listed pursuant to either federal ESA or California ESA. However, it is fully protected according to Section 3511 of the California Fish and Game Code and the federal Bald and Golden Eagle Protection Act. Golden eagles generally nest on cliff ledges and/or large lone trees in rolling to mountainous terrain. Golden eagle nests throughout California except the Central Valley, the immediate coast, and portions of southeastern California (Kochert et al. 2002). Occurrences within the Central Valley are usually dispersing post-breeding birds, non-breeding subadults, or migrants. Foraging habitat includes open grassland and savannah.

There are no CNDDB documented occurrences of golden eagle within five miles of the Study Area (CDFW 2019); however, a golden eagle was observed flying overhead during the site visit. Additionally, the transmission towers and annual grassland within the Study Area provide suitable nesting and foraging habitat for this species. Golden eagle has potential to nest and forage onsite.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is not listed pursuant to either federal ESA or California ESA; however, this species is designated as a BCC by USFWS and a SSC by the CDFW. Burrowing owls inhabit dry open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as golf courses, cemeteries, and roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Poulin et al. 2011). This species typically uses burrows created by fossorial mammals, most notably the California ground squirrel, but may also use manmade structures such as cement culverts or pipes; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (CDFG 2012). The breeding season typically occurs between February 1 and August 31 (California Burrowing Owl Consortium 1993; CDFG 2012).

There is one CNDDB documented occurrence of burrowing owl immediately adjacent to the Study Area (CDFW 2019). The annual grassland community and agriculture fields onsite provide suitable nesting habitat for burrowing owls. No burrowing owls were observed during the site visit; however, many

California ground squirrel burrows were observed onsite. Burrowing owl has potential to nest and forage onsite.

Tricolored Blackbird

Tricolored blackbird (TRBL; *Agelaius tricolor*) is listed as a threatened species pursuant to the California ESA and a USFWS BCC. This colonial nesting species is distributed widely throughout the Central Valley, Coast Range, and into Oregon, Washington, Nevada, and Baja California (Meese et al. 2014). TRBL nests in colonies that can range from several pairs to several thousand pairs, depending on prey availability, the presence of predators, or level of human disturbance. TRBL nesting habitat includes emergent marsh, riparian woodland/scrub, blackberry thickets, densely vegetated agricultural and idle fields (e.g., wheat, triticale, safflower, fava bean fields, thistle, mustard, cane, and fiddleneck), usually with some nearby standing water or ground saturation (Meese et al. 2014). TRBL feed mainly on grasshoppers during the breeding season, but may also forage upon a variety of other insects, grains, and seeds in open grasslands, wetlands, feedlots, dairies, and agricultural fields (Meese et al. 2014). The nesting season is generally from March through August.

There is one CNDDB documented nesting colony of TRBL within five miles of the Study Area (CDFW 2019). While there is no suitable nesting habitat within the Study Area, the annual grassland provides suitable foraging habitat for this species. Additionally, TRBL was observed foraging within the vicinity of the Study Area during the March 15, 2017 site visit. TRBL has potential to forage onsite.

4.6.7 Mammals

A total of six special-status mammal species were identified as having potential to occur within the Study Area based on the literature review (Table 2). Upon further analysis and after the reconnaissance site visit, two species were considered to be absent from the Study Area due to the lack of suitable habitat. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining four species that have the potential to occur within the Study Area are presented below.

American Badger

American badger (*Taxidea taxus*) is designated in California as a SSC. The species historically ranged throughout much of the state, except in humid coastal forests. Badgers were once numerous in the Central Valley; however, populations now occur in low numbers in the surrounding peripheral parts of the valley and in the adjacent lowlands of eastern Monterey, San Benito, and San Luis Obispo counties (Williams 1986). Badgers occupy a variety of habitats, including grasslands and savannas. The principal requirements seem to be significant food supply, friable soils, and relatively open, uncultivated ground (Williams 1986).

There are no CNDDB documented occurrences of American badger within five miles of the Study Area (CDFW 2019). The annual grassland onsite provides suitable habitat for this species. American badger has potential to occur onsite.

Pallid Bat

Pallid bat (*Antrozous pallidus*) is not listed pursuant to federal ESA or California ESA; however, this species is considered a SSC by CDFW. The pallid bat is a large, light-colored bat with long, prominent ears and pink, brown, or grey wing and tail membranes. This species ranges throughout North America from the interior of British Columbia, south to Mexico, and east to Texas. The pallid bat inhabits low elevation (below 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forest (above 7,000 feet). This species roosts alone or in groups in the crevices of rocky outcrops and cliffs, caves, mines, trees, and in various manmade structures such as bridges and barns. Pallid bats are feeding generalists that glean a variety of arthropod prey from surfaces as well as capturing insects on the wing. Foraging occurs over grasslands, oak savannahs, ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. Although this species utilizes echolocation to locate prey, they often use only passive acoustic cues. This species is not thought to migrate long distances between summer and winter sites (WBWG 2017).

There are no CNDDB documented occurrences of pallid bat within five miles of the Study Area (CDFW 2019). However, the orchard trees and abandoned barn structures within the Study Area provide suitable roosting habitat for this species and the annual grassland and orchard provide suitable foraging habitat for this species. Pallid bad has potential to roost and forage onsite.

San Joaquin Kit Fox

San Joaquin kit fox (*Vulpes macrotis mutica*) is listed as threatened under the California ESA and as endangered under the federal ESA. Although the precise historical range of the San Joaquin kit fox is unknown, Grinnell et al. (1937) believed that prior to 1930, San Joaquin kit fox occupied most of the San Joaquin Valley from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side. Since then the San Joaquin kit fox population has declined primarily as a result of habitat loss to agricultural, urban, industrial, and mineral development in the San Joaquin Valley. San Joaquin kit fox has been listed as endangered for over 30 years, yet despite the loss of habitat and apparent decline in numbers since the early 1970s, there has never been a comprehensive survey of its entire range or habitat that was once thought to be occupied (USFWS 1983; Morrell 1971). Despite the lack of a comprehensive data set, local surveys, research projects and incidental sightings indicate that kit foxes currently inhabit some areas of suitable habitat on the San Joaquin Valley floor and in the surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi Mountains, from southern Kern County north to Contra Costa, Alameda, and San Joaquin counties on the west, and near La Grange, Stanislaus County on the east side of the San Joaquin Valley (Williams in litt. 1990), and some of the larger scattered islands of natural land on the San Joaquin Valley floor in Kern, Tulare, Kings, Fresno, Madera, and Merced counties (USFWS 1998).

In the southern portion of the range, the kit fox is commonly associated with Valley sink scrub, Valley saltbush scrub, upper Sonoran subshrub scrub, and annual grassland. Kit foxes also inhabit grazed grasslands, petroleum fields (Morrell 1971; O'Farrell 1980), and survive adjacent to tilled or fallow fields (Jensen 1972; Ralls and White 1991). In the central portion of the range, which includes Madera County, San Joaquin kit fox is associated with Valley sink scrub, interior coast range saltbush scrub, upper Sonoran subshrub scrub, annual grassland and the remaining native grasslands. Agriculture dominates this region where kit foxes mostly inhabit grazed, nonirrigated grasslands, but also live next to and forage in tilled or fallow fields, irrigated row crops, orchards, and vineyards (USFWS 1998). In the northern portion of their range, kit foxes commonly are associated with annual grassland (Hall 1983) and valley oak woodland (Bell et al. 1994). Kit foxes inhabit grazed grasslands, grasslands with wind turbines, and also live adjacent to and forage in tilled and fallow fields, and irrigated row crops (Bell et al. 1994). They usually inhabit areas with loose-textured (friable) soils, suitable for den excavation (USFWS 1983). Where soils make digging difficult, the foxes frequently use and modify burrows built by other animals (Orloff et al. 1986). Structures such as culverts, abandoned pipelines, and well casings also may be used as den sites (USFWS 1983).

San Joaquin kit fox is primarily nocturnal and carnivorous, but commonly seen during the day in the late spring and early summer (Orloff et al. 1986). Major prey includes kangaroo rats (*Dipodomys* sp.), black-tailed jackrabbits (*Lepus californicus*), desert cottontails (*Sylvilagus audubonii*), deer mice (*Peromyscus maniculatus*), California ground squirrels, ground-nesting birds, and insects (Scrivener et al. 1987).

There is one CNDDB documented occurrence of San Joaquin kit fox within five miles of the Study Area (CDFW 2019). The annual grassland in the Study Area provides suitable dispersal habitat for this species. San Joaquin kit fox has low potential to occur onsite.

Spotted Bat

Spotted bat (*Euderma maculatum*) is not listed pursuant to either federal ESA or California ESA; however, this species is considered a SSC by CDFW. Spotted bat is easily identifiable because of its unique coloration, which includes black dorsal fur with three white spots, a white ventral surface, and long pink ears. The spotted bat occurs throughout western North America from British Columbia to Jalisco, Mexico. This species has been found from below sea level to 8,858 feet in elevation, and occurs in arid, low-desert habitats all the way to high-elevation conifer forests. Specific vegetation types where spotted bats are found include desert, subalpine meadows, pinyon-juniper woodland, ponderosa pine, mixed-conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. Roosting sites are generally cracks, crevices, and caves, high in fractured rock cliffs if available. When foraging, spotted bats fly about 66 to 164 feet above the ground and echolocate at a wavelength audible to humans but often not to prey species. The diet of this species is made up primarily of moths (WBWG 2017).

There is one CNDDB documented occurrence within five miles of the Study Area (CDFW 2019); however, there is no suitable roosting habitat within the Study Area. The annual grassland onsite provides suitable foraging habitat. Spotted bat has low potential to forage onsite.

4.7 Wildlife Movement/Corridors

The Study Area is largely undeveloped with several wetland features scattered throughout. Wildlife likely use the annual grassland and wetland features for movement and dispersal; however, the active agricultural fields may hinder wildlife use. Wildlife species that may use the Study Area as a migratory or movement corridor include birds such as passerines, raptors, wading birds, and waterfowl. Highly mobile mammal species such as coyote (*Canis latrans*) and raccoon (*Procyon lotor*) are expected to occasionally move through the Study Area.

5.0 RECOMMENDATIONS

5.1 Waters of the U.S. and State

Approximately 7.548 acres of potential Waters of the U.S. are located within the Study Area (see Figure 2). Based on the Project footprint, waters of the U.S and State will most likely be filled. The following mitigation measures are recommended to minimize and compensate for potential impacts to Waters of the U.S. and State:

- Authorization to fill wetlands and other Waters of the U.S. under Section 404 of the federal CWA (Section 404 Permit) must be obtained from USACE prior to discharging any dredged or fill materials into any Waters of the U.S. Mitigation measures will be developed as part of the Section 404 Permit to ensure no-net-loss of wetland function and values. To facilitate such authorization, an application for a Section 404 Permit for the Project will be prepared and submitted to USACE and will include direct, avoided, and preserved acreages to Waters of the U.S. Mitigation for impacts to Waters of the U.S. typically consists of a minimum 1:1 ratio for direct impacts; however, final mitigation requirements will be developed in consultation with USACE.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA must be obtained from the RWQCB for Section 404 permit actions.

5.2 Special-Status Species

5.2.1 Plants

A total of 12 special-status plants have potential to occur within the Study Area. Ten of these species (brassy bryum, Hoover’s calycadenia, California jewelflower, Ewan’s larkspur, dwarf downingia, shining navarretia, hairy Orcutt grass, Hartweg’s golden sunburst, and Greene’s tuctoria) were not identified during guideline-level special-status plant surveys (early and late season) conducted by ECORP for the majority of the Study Area on April 18, 19, and 20, 2017; June 21, 22, and 23, 2017; April 16, 17, and 18, 2019; May 6, 2019; and March 11, 2020. Two special-status plants (succulent owl’s clover and San Joaquin Valley Orcutt grass) were identified during the surveys. If the Project impacts areas that were not covered during the surveys described above, the following measures are recommended:

- Conduct guideline-level early season special-status plant surveys (early season only) according to USFWS, CDFW, and CNPS protocols for any impact area that was not surveyed. Surveys should be timed according to the blooming period for target species and known reference populations, if available, and/or local herbaria should be visited prior to surveys to confirm the appropriate phenological state of the target species.

- If additional special-status plants are identified, follow the measures listed below for Succulent owl's clover and San Joaquin Valley Orcutt grass. If no additional special-status plants are identified, no additional measures are recommended.
- Succulent owl's clover was found in three vernal pools within the Study Area and San Joaquin Valley Orcutt grass was found in one vernal pool. Both are federally listed as threatened and State listed as endangered. Additionally, critical habitat for both these species is mapped within the Study Area. It is recommended to establish avoidance zones around plants to clearly demarcate areas for avoidance. Avoidance measures and buffer distances may vary between species and the specific avoidance zone distance will be determined in coordination with appropriate resource agencies (CDFW and USFWS). If plants cannot be avoided, consultation with USFWS (under Sections 7 of the federal ESA) and/or take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required.

5.2.2 Invertebrates

Crotch Bumble Bee

The Study Area provides suitable habitat for the California ESA Candidate Crotch bumble bee. The following measures are recommended:

- A preconstruction survey will be performed by a qualified biologist to determine the potential presence of this species.
- If Crotch's bumble bee is found, consultation will take place with CDFW to establish mitigation, avoidance, and/or minimization measures.

Large Branchiopods

The Study Area provides suitable habitat for the federally threatened vernal pool fairy shrimp and the CNDDB-tracked Midvalley fairy shrimp. USFWS guideline-level dry and wet season surveys have not been conducted for the Study Area; however, vernal pool fairy shrimp are assumed present based on the habitats present onsite and CNDDB documented occurrences onsite and in close proximity to the Study Area. Since vernal pool fairy shrimp are listed under the federal ESA, take coverage from USFWS (under Sections 7 or 10 of the federal ESA) may be required for any impacts to this species and/or its habitat.

5.2.3 Fish

The Study Area does not provide suitable habitat for any special-status fish species. No measures are recommended for special-status fish species.

5.2.4 Amphibians

The Study Area provides suitable habitat for California tiger salamander and western spadefoot. California tiger salamander is assumed present based on the habitats present onsite and CNDDB documented occurrences onsite and in close proximity to the Study Area. Additionally, western spadefoot is considered present as this species was observed onsite during site visits conducted in 2017. The following measures are recommended.

California Tiger Salamander

The Study Area provides suitable habitat for the federally and State-threatened California tiger salamander. Additionally, critical habitat for this species has been mapped within the Study Area. Prior to construction activities, take coverage from USFWS under Sections 7 or 10 of the federal ESA may be required for any impacts to California tiger salamander and/or their habitat. In addition, take coverage from CDFW under Section 2081 of the California Fish and Game Code may be required for any impacts to California tiger salamander and/or its habitat.

Western Spadefoot

To avoid potential impacts to western spadefoot, the following is recommended:

- A preconstruction survey for western spadefoot shall be conducted by a qualified biologist prior to construction activities. Any western spadefoot individuals discovered in the Project work area immediately prior to or during Project activities shall be allowed to move out of the work area of their own volition. If this is not feasible, they shall be captured by a qualified wildlife biologist and relocated out of harm's way to the nearest suitable habitat at least 100 feet from the Project work area where they were found.

5.2.5 Reptiles

The Study Area provides marginally suitable habitat for Blainville's horned lizard. The following measures are recommended:

- Conduct a pre-construction Blainville's horned lizard survey 48 hours prior to construction activities. Any Blainville's horned lizard individuals discovered in the Project work area immediately prior to or during Project activities shall be allowed to move out of the work area of their own volition. If this is not feasible, they shall be captured by a qualified wildlife biologist and relocated out of harm's way to the nearest suitable habitat at least 100 feet from the Project work area where they were found.

5.2.6 Birds and MBTA Protected Birds (including Raptors)

Suitable nesting and/or wintering and foraging habitat for five special-status birds is present within the Study Area. These include long-billed curlew, Swainson's hawk, golden eagle, burrowing owl, and TRBL. Swainson's hawk, golden eagle, and TRBL were observed on or within the vicinity of the Study Area during 2017 site visits. If nesting individuals are present during construction present, the Project could result in harassment to nesting individuals and may temporarily disrupt foraging activities.

In addition to the above-listed special-status birds, all native birds, including raptors, are protected under the California Fish and Game Code and the federal MBTA. As such, to ensure that there are no impacts to active nests, the following mitigation measures are recommended:

- Conduct a pre-construction nesting raptor and bird survey of all suitable habitat on the Project site within 14 days of the commencement of construction during the nesting season (February 1 – August 31). Surveys should be conducted within 0.25 mile of the Project site for Swainson's hawk, 300 feet of the Project site for nesting raptors, including burrowing owl, and 100 feet of the Project site for nesting birds.
- If active nests are found, a no-disturbance buffer around the nests shall be established. The buffer distance shall be established by a qualified biologist and is recommended to be a minimum 300 feet for raptors and 50 feet for non-raptor birds. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest tree, to be determined by a qualified biologist. Once the young are independent of the nest, no further measures are necessary. Pre-construction nesting surveys are not required for construction activity outside the nesting season.

Two special-status birds identified as potentially occurring, long-billed curlew and TRBL, are migrants and/or wintering species. These species do not nest in this region or nesting habitat does not occur onsite. Therefore, no surveys for wintering and/or migrant or foraging species are recommended.

5.2.7 Mammals

The Study Area provides potential habitat for American badger, pallid bat, San Joaquin kit fox, and spotted bat. The following measures are recommended.

American Badger

Conduct a pre-construction American badger survey 48 hours prior to construction activities. If American badgers are found, consultation with CDFW prior to initiation of construction activities may be required.

Pallid Bat and Spotted Bat

Spotted bat has potential to forage onsite; no surveys are recommended for foraging bat species. Pallid bat has potential to roost within trees and manmade structures within the Study Area. Therefore, the following measure is recommended.

- Prior to removal of trees or demolition of manmade structures within the Study Area, it is recommended that a qualified biologist conduct a survey to determine whether or not bats are present. If evidence of bat occurrence is found, additional measures may be required. If bats are not found during the surveys, no further measures are necessary.

San Joaquin Kit Fox

Within 30 days prior to the start of Project activity, a qualified wildlife biologist shall perform transect surveys of the Project work area and a 250-foot buffer, to identify potential dens and other kit fox sign. If kit foxes are found on or within 250 feet of the Project work area, all activity shall cease until a qualified wildlife biologist confirms that the individual(s) has left of its own volition.

5.3 Wildlife Movement/Corridors

Wildlife have potential to use the Study Area for movement. Construction of wildlife crossings at various locations throughout the Project alignment is recommended to facilitate wildlife movement.

6.0 REFERENCES

American Ornithologists' Union. 1957. Check-list of North American birds. 5th ed. American Ornithol. Union, Washington, D.C.

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. The Jepson Manual; Vascular Plants of California, Second Edition. University of California Press, Berkeley, California.

Bechard, Marc J., C. Stuart Houston, Jose H. Sarasola and A. Sidney England. 2010. Swainson's Hawk (*Buteo swainsoni*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/265

Belk, D. and M. Fugate. 2000. Two new Branchinecta (Crustacea: Anostraca) from the southwestern United States. The Southwestern Naturalist 45:111-117.

Bell, H.M., J.A. Alvarez, L.L. Eberhardt, and K. Ralls. 1994. Distribution and abundance of San Joaquin kit fox. California Dept. Fish and Game, Sacramento, Nongame Bird and Mammal Sec., Unpubl. Rep.

California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. Dated April 1993.

CDFG. 1988. California's Wildlife: Volume 1: Amphibians and Reptiles. 272 pp.

________. 2005. The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004. Sacramento, California.

________. 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. California Natural Resources Agency, Sacramento, CA. November 24, 2009.

________. 2012. Staff Report on Burrowing Owl Mitigation. Dated March 7, 2012.

CDFW. 2020. Rarefind 5. Online Version, commercial version. California Natural Diversity Database. The Resources Agency, Sacramento. Accessed April 20, 2020.

________. 2019. Natural Diversity Database. August 2019. Special Animals List. Periodic publication. 67 pp.

CNPS. 2020. Inventory of Rare and Endangered Plants in California (online edition, v8-02). California Native Plant Society. Sacramento, CA. Available online: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Accessed April 20, 2020.

Dugger, B.D., and K.M. Dugger. 2002. Long-billed Curlew (*Numenius americanus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/628

ECORP Consulting Inc. 2020. Special-Status Plant Survey Report. Rio Mesa Boulevard. In Preparation.

Eriksen, C. H. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Inc. Eureka, California.

Estep, J. A. 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-1987. California Department of Fish and Game, Nongame Bird and Mammal Section Report.

Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. Fur-bearing mammals of California. Vol. 2. Univ. California Press, Berkeley.

Goulson, D. 2010. Bumblebees: behaviour, ecology, and conservation. Oxford University Press, 88 New York. 317pp.

Hall, F.A. 1983. Status of the San Joaquin kit fox, *Vulpes macrotis mutica*, at the Bethany wind turbine generating site, Alameda County, California. Unpubl. Rep., California Dept. Fish and Game, Sacramento, 34 pp.

Hatfield, R., S. Colla, S. Jepsen, L. Richardson, R. Thorp, and S. F. Jordan. 2014. IUCN assessments for North American Bombus spp. Technical report for the North American IUCN Bumble Bee Specialist Group. Assessments completed 2014, document updated in February 2015. 56 pp.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. A Report to the California Department of Fish and Game, Rancho Cordova, California.

Jensen, C.C. 1972. San Joaquin kit fox distribution. U.S. Fish and Wildlife Service, Sacramento, CA, Unpubl. Rep., 18 pp.

Kochert, M.N. and K. Steenhof. 2002. Golden eagles in the U. S. and Canada: status, trends, and conservation challenges. Journal of Raptor Research 36 (supplement): 32 – 40.

Laredo, I., D. Van Vuren, and M. L. Morrison. 1996. Habitat use and migration behavior of the California tiger salamander. Journal of Herpetology 30: 282 – 285.

Leaché, A. D., M. S. Koo, C. L. Spencer, T. J. Papenfuss, R. N. Fisher and J. A. McGuire. 2009. Quantifying ecological, morphological, and genetic variation to delimit species in the coast horned lizard species complex (*Phrynosoma*). Proceedings of the National Academy of Sciences 106: 12418-12423.

Madera County. 1995. Madera County General Plan Policy Document. Adopted October 24, 1995. Available at: http://www.madera-county.com/index.php/county-forms/category/46-general-plan-document-materials?download=6386:general-plan-policy-document. Accessed 19 May 2017.

Mayer, K. E. and W. F. Laudenslayer Jr (Eds). 1988. A Guide to Wildlife Habitats of California. California Department of Fish and Game.

Meese, R.J., E.C. Beedy and W.J. Hamilton, III. 2014. Tricolored Blackbird (*Agelaius tricolor*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/423.

Montanucci, R. R. 2004. Geographic variation in Phrynosoma coronatum (Lacertilia, Phrynosomatidae): Further evidence for a Peninsular Archipelago. Herpetologica 60: 117-139.

Morrell, S.H. 1971. Life history of the San Joaquin kit fox. California Dept. Fish and Game, Sacramento, Spec. Wildl. Invest., Unpubl. Rep., 25 pp.

NRCS. 2017a. Soil Survey Geographic (SSURGO) Database for Madera County, California. U.S. Department of Agriculture. Available Online: https://gdg.sc.egov.usda.gov/.

________. 2017b. National Hydric Soils List. Available Online: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed 22 May 2017.

NRCS, USGS, and USEPA. 2016. Watershed Boundary Dataset for California. Available online: http://datageteway.nrcs.usda.gov. Accessed 21 September 2016.

O'Farrell, T.P. 1980. Elk Hills endangered and threatened species program, phase 1 progress summary. U.S. Dept. Energy Topical Rep. No. EGG 1183-2403, Santa Barbara Operations, EG&G Energy Measurements, Goleta, CA, 19 pp.

Orloff, S., F. Hall, and L. Spiegel. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of their range. Trans. West. Sect. Wildl. Soc. 22: 60–70.

Pacific Fishery Management Council. 2000. Review of 1999 Ocean Salmon Fisheries. Portland Oregon. February 2000.

Poulin, Ray G., L. Danielle Todd, E. A. Haug, B. A. Millsap and Mark S. Martell. 2011. Burrowing Owl (Athene cunicularia), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/burowl.

Ralls, K., and P.J. White. 1991. Kit fox-coyote relationships in the Carrizo Plain Natural Area. U.S. Fish and Wildlife Service, Sacramento, CA, Ann. Rep., 6 pp.

Scrivener, J.H., T.P. O'Farrell, T.T. Kato, and M.K. Johnson. 1987. Diet of the San Joaquin kit fox, Vulpes macrotis mutica, on Naval Petroleum Reserve #1, Kern County, California, 1980-1984. Rep. No. EGG 10282-2168, EG&G Energy Measurements, Goleta, CA, 26 pp.

Sherbrooke, W. C. 2003. Introduction to Horned Lizards of North America. University of California Press, Berkeley. 191 pp.

Shuford, W.D. and T. Gardali, eds. 2008. California Bird Species of Special Concern. Studies of Western Birds No. 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Game, Sacramento, California.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. Vista, California. 342 pp.

Smith, Kimberly G., Sara Ress Wittenberg, R. Bruce Macwhirter and Keith L. Bildstein. 2011. Northern Harrier (*Circus cyaneus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna.org/Species-Account/bna/species/norhar

Stebbins, R. C. 1972. California amphibians and reptiles. University of California press. Berkeley, California. 152 pp.

________. 2003. Western Reptiles and Amphibians. Houghton-Mifflin Co., Boston, New York. 533 pp.

Stebbins, R. C. and S. M. McGinnis. 2012. Field Guide to Amphibians and Reptiles of California (revised edition). University of California Press, Berkeley.

Thompson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. University of California Press, Oakland, California.

Thorp, R.W., D.S. Horning, and L.L Dunning. 1983. Bumble bees and cuckoo bumble bees of California (Hymenoptera: Apidae). Bulletin of the California Insect Survey 23: 1-79 pp.

USFWS. 1983. San Joaquin kit fox recovery plan. U.S. Fish and Wildlife Service, Portland, OR, 84 pp.

________. 1998. Endangered Species Recovery Program, Recovery Plan for Upland Species of the San Joaquin Valley, California. California State University, Stanislaus.

________. 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. January 2000.

________. 2003. Final Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon; Final Rule. Federal Register 68(151):46684-46867.

________. 2004. 12-Month Finding for a Petition to List the Midvalley Fairy Shrimp as Endangered. Federal Register 69(16):3592-3598.

________. 2015. Draft recovery plan for the Central California distinct population segment of the California tiger salamander (*Ambystoma californiense*). U. S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 53 pp.

________. 2017. USFWS Threatened & Endangered Species Active Critical Habitat Report. Available online at: https://ecos.fws.gov/ecp/report/table/critical-habitat.html. Accessed September 2017.

________. 2019. Species Lists. Available by request online: https://ecos.f ws.gov/ipac/. Accessed August 12, 2019.

USGS. 1964. "Lanes Bridge, California" 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

________. 1973. "Lanes Bridge, California" 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

WBWG. 2017. Western Bat Species Accounts. Accessed February 2017. Available on-line at: http://wbwg.org/western-bat-species/.

Williams, D. F. 1986. Mammalian Species of Special Concern in California. State of California Department of Fish and Game, Wildlife Management Division. Sacramento, California. 112pp.

________. 1990. Assessment of potential habitat for the blunt-nosed leopard lizard and San Joaquin kit fox in western Madera County, California. U.S. Fish and Wildlife Service, Endangered Species Office, Sacramento, CA, 31 pp.

Williams, P.H., R.W. Thorp, L.L. Richardson, and S.R. Colla. 2014. Bumble bees of North America: An Identification Guide. Princeton University Press. 208 pp.

Xerxes Society. 2018. A petition to the State of California Fish and Game Commission. Dated October 2018. Available https://xerces.org/sites/default/files/2019-10/CESA-petition-Bombus-Oct2018.pdf

Zeiner, D. C., W. F. Laudenslayer, Jr., and K. E. Mayer (Eds). 1988. California's Wildlife, Volume I, Amphibian and Reptiles. California Statewide Habitat Relationships System, California Department of Fish and Game, Sacramento, California.

________, W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (Eds). 1990a. California's Wildlife, Volume II, Birds. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

________, W. F. Laudenslayer, Jr., K. E. Mayer, and M. White (Eds). 1990b. California's Wildlife, Volume III, Mammals. California Statewide Wildlife Habitat Relationships System. California Department of Fish and Game, Sacramento, California.

LIST OF ATTACHMENTS

ATTACHMENT A

Special-Status Species Searches

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Little Table Mtn. (3711917) OR Daulton (3711918) OR Millerton Lake West (3711916) OR Gregg (3611988) OR Friant (3611986) OR Lanes Bridge (3611987) OR Herndon (3611978) OR Fresno North (3611977) OR Clovis (3611976))

				Elev.		Element Occ. Ranks						Population Status		Presence		
Name (Scientific/Common)	**CNDDB Ranks**	**Listing Status (Fed/State)**	**Other Lists**	**Range (ft.)**	**Total EO's**	**A**	**B**	**C**	**D**	**X**	**U**	**Historic > 20 yr**	**Recent <= 20 yr**	**Extant**	**Poss. Extirp.**	**Extirp.**
Agelaius tricolor tricolored blackbird	G2G3 S1S2	None Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	330 613	955 S:8	0	0	1	0	2	5	4	4	6	1	1
Ambystoma californiense California tiger salamander	G2G3 S2S3	Threatened Threatened	CDFW_WL-Watch List IUCN_VU-Vulnerable	281 1,300	1231 S:65	8	18	6	2	7	24	25	40	58	4	3
Anniella pulchra northern California legless lizard	G3 S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	300 300	375 S:1	0	0	0	0	0	1	1	0	1	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,360 1,360	420 S:1	0	0	0	0	0	1	1	0	1	0	0
Ardea alba great egret	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	296 296	43 S:1	0	0	0	0	0	1	0	1	1	0	0
Arizona elegans occidentalis California glossy snake	G5T2 S2	None None	CDFW_SSC-Species of Special Concern	300 300	260 S:1	0	0	0	0	0	1	1	0	1	0	0
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	331 435	1989 S:6	1	2	0	0	0	3	4	2	6	0	0
Bombus crotchii Crotch bumble bee	G3G4 S1S2	None Candidate Endangered		300 1,100	276 S:3	0	0	0	0	0	3	3	0	3	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

				Elev.		Element Occ. Ranks						Population Status		Presence		
Name (Scientific/Common)	**CNDDB Ranks**	**Listing Status (Fed/State)**	**Other Lists**	**Range (ft.)**	**Total EO's**	**A**	**B**	**C**	**D**	**X**	**U**	**Historic > 20 yr**	**Recent <= 20 yr**	**Extant**	**Poss. Extirp.**	**Extirp.**
Branchinecta lynchi vernal pool fairy shrimp	G3 S3	Threatened None	IUCN_VU-Vulnerable	273 650	770 S:59	5	16	6	3	1	28	13	46	58	1	0
Branchinecta mesovallensis midvalley fairy shrimp	G2 S2S3	None None		335 460	128 S:3	1	0	0	0	0	2	2	1	3	0	0
Buteo swainsoni Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	282 665	2518 S:10	1	4	0	0	0	5	2	8	10	0	0
Calicina mesaensis Table Mountain harvestman	G1 S1	None None		760 760	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Calycadenia hooveri Hoover's calycadenia	G2 S2	None None	Rare Plant Rank - 1B.3 BLM_S-Sensitive		37 S:1	0	0	0	0	0	1	0	1	1	0	0
Castilleja campestris var. succulenta succulent owl's-clover	G4?T2T3 S2S3	Threatened Endangered	Rare Plant Rank - 1B.2	300 500	95 S:15	3	5	1	1	2	3	12	3	13	2	0
Caulanthus californicus California jewelflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		67 S:1	0	0	0	0	1	0	1	0	0	0	1
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T2T3 S1	Threatened Endangered	BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	270 345	156 S:2	0	0	0	0	2	0	2	0	0	0	2
Cryptantha hooveri Hoover's cryptantha	GH SH	None None	Rare Plant Rank - 1A	1,200 1,200	4 S:1	0	0	0	0	0	1	1	0	1	0	0
Desmocerus californicus dimorphus valley elderberry longhorn beetle	G3T2 S2	Threatened None		225 270	271 S:2	0	0	1	0	0	1	2	0	2	0	0
Dipodomys nitratoides exilis Fresno kangaroo rat	G3TH SH	Endangered Endangered	IUCN_VU-Vulnerable		12 S:1	0	0	0	0	1	0	1	0	0	0	1

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Downingia pusilla dwarf downingia	GU S2	None None	Rare Plant Rank - 2B.2	300 300	132 S:1	0	0	0	0	0	1	1	0	1	0	0
Efferia antiochi Antioch efferian robberfly	G1G2 S1S2	None None		260 300	4 S:2	0	0	0	0	0	2	2	0	2	0	0
Egretta thula snowy egret	G5 S4	None None	IUCN_LC-Least Concern	296 296	20 S:1	0	0	0	0	0	1	0	1	1	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	388 1,230	1385 S:7	1	0	0	2	0	4	2	5	7	0	0
Eremophila alpestris actia California horned lark	G5T4Q S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	370 370	94 S:1	0	0	0	1	0	0	1	0	1	0	0
Eryngium spinosepalum spiny-sepaled button-celery	G2 S2	None None	Rare Plant Rank - 1B.2	405 630	108 S:6	3	2	0	0	0	1	1	5	6	0	0
Euderma maculatum spotted bat	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	500 500	68 S:1	0	0	0	0	0	1	1	0	1	0	0
Eumops perotis californicus western mastiff bat	G5T4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern WBWG_H-High Priority	310 320	296 S:4	0	0	0	0	0	4	4	0	4	0	0
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	G2 S2.2	None None		280 280	68 S:1	0	0	0	0	0	1	1	0	1	0	0
Imperata brevifolia California satintail	G4 S3	None None	Rare Plant Rank - 2B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	300 300	32 S:1	0	0	0	0	0	1	1	0	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Layia munzii Munz's tidy-tips	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive		68 S:1	0	0	0	0	0	1	1	0	1	0	0
Leptosiphon serrulatus Madera leptosiphon	G3 S3	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	600 1,050	27 S:4	0	0	0	0	0	4	4	0	4	0	0
Linderiella occidentalis California linderiella	G2G3 S2S3	None None	IUCN_NT-Near Threatened	285 642	438 S:34	1	11	2	0	0	20	15	19	34	0	0
Lupinus citrinus var. citrinus orange lupine	G2T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,950 2,950	57 S:1	1	0	0	0	0	0	0	1	1	0	0
Lytta moesta moestan blister beetle	G2 S2	None None		410 410	12 S:1	0	0	0	0	1	0	1	0	0	1	0
Lytta molesta molestan blister beetle	G2 S2	None None		275 360	17 S:2	0	0	0	0	0	2	2	0	1	1	0
Metapogon hurdi Hurd's metapogon robberfly	G1G2 S1S2	None None		325 325	3 S:1	0	0	0	0	0	1	1	0	0	1	0
Mylopharodon conocephalus hardhead	G3 S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	255 255	33 S:1	0	0	0	0	0	1	1	0	1	0	0
Navarretia nigelliformis ssp. radians shining navarretia	G4T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive		102 S:1	0	0	0	0	1	0	1	0	0	1	0
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	G1 S1.1	None None		350 350	21 S:1	0	0	0	0	0	1	1	0	1	0	0
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	G3 S3.1	None None		300 400	126 S:9	1	2	0	2	0	4	9	0	9	0	0
Nycticorax nycticorax black-crowned night heron	G5 S4	None None	IUCN_LC-Least Concern	296 296	37 S:1	0	0	0	0	0	1	0	1	1	0	0
Orcuttia inaequalis San Joaquin Valley Orcutt grass	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1	300 410	47 S:11	1	2	2	2	4	0	5	6	7	0	4
Orcuttia pilosa hairy Orcutt grass	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	275 410	35 S:11	0	4	0	3	4	0	6	5	7	4	0

				Elev.		Element Occ. Ranks						Population Status		Presence		
Name (Scientific/Common)	**CNDDB Ranks**	**Listing Status (Fed/State)**	**Other Lists**	**Range (ft.)**	**Total EO's**	**A**	**B**	**C**	**D**	**X**	**U**	**Historic > 20 yr**	**Recent <= 20 yr**	**Extant**	**Poss. Extirp.**	**Extirp.**
Perognathus inornatus San Joaquin Pocket Mouse	G2G3 S2S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern	265 265	127 S:3	0	0	0	0	1	2	3	0	2	0	1
Phalacrocorax auritus double-crested cormorant	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	332 332	39 S:1	0	0	0	0	0	1	0	1	1	0	0
Phrynosoma blainvillii coast horned lizard	G3G4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	300 300	784 S:1	0	0	0	0	1	0	1	0	0	1	0
Pseudobahia bahiifolia Hartweg's golden sunburst	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	440 500	27 S:5	0	4	0	0	1	0	1	4	4	1	0
Rana boylii foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	1,252 1,252	2468 S:1	0	0	0	0	0	1	1	0	1	0	0
Sagittaria sanfordii Sanford's arrowhead	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	310 360	126 S:7	0	1	1	0	0	5	6	1	7	0	0
Spea hammondii western spadefoot	G3 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	259 1,380	1334 S:77	5	16	6	4	1	45	20	57	76	1	0
Sycamore Alluvial Woodland Sycamore Alluvial Woodland	G1 S1.1	None None		360 360	17 S:1	0	0	1	0	0	0	1	0	1	0	0
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	250 1,200	592 S:6	0	0	0	0	0	6	5	1	6	0	0
Tropidocarpum capparideum caper-fruited tropidocarpum	G1 S1	None None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive		18 S:1	0	0	0	0	0	1	1	0	1	0	0
Tuctoria greenei Greene's tuctoria	G1 S1	Endangered Rare	Rare Plant Rank - 1B.1	405 405	50 S:1	0	0	0	0	1	0	1	0	0	0	1

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	IUCN_NT-Near Threatened NABCI_YWL-Yellow Watch List	345 360	503 S:2	0	0	0	0	2	0	2	0	0	2	0
Vulpes macrotis mutica San Joaquin kit fox	G4T2 S2	Endangered Threatened		302 410	1018 S:2	0	0	0	0	0	2	2	0	2	0	0

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

18 matches found. *Click on scientific name for details*

Search Criteria

California Rare Plant Rank is one of [1A, 1B, 2A, 2B, 4],
FESA is one of [Endangered, Threatened, Candidate, Not Listed],
CESA is one of [Endangered, Threatened, Rare, Not Listed], Found in Quads 3711918, 3711917, 3711916, 3611988, 3611987, 3611986, 3611978 3611977 and 3611976;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Bryum chryseum	brassy bryum	Bryaceae	moss		4.3	S3	G5
Calycadenia hooveri	Hoover's calycadenia	Asteraceae	annual herb	Jul-Sep	1B.3	S2	G2
Castilleja campestris var. succulenta	succulent owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	(Mar)Apr-May	1B.2	S2S3	G4? T2T3
Caulanthus californicus	California jewelflower	Brassicaceae	annual herb	Feb-May	1B.1	S1	G1
Cryptantha hooveri	Hoover's cryptantha	Boraginaceae	annual herb	Apr-May	1A	SH	GH
Delphinium hansenii ssp. ewanianum	Ewan's larkspur	Ranunculaceae	perennial herb	Mar-May	4.2	S3	G4T3
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	2B.1	S3	G4
Leptosiphon serrulatus	Madera leptosiphon	Polemoniaceae	annual herb	Apr-May	1B.2	S3	G3
Lupinus citrinus var. citrinus	orange lupine	Fabaceae	annual herb	Apr-Jul	1B.2	S2	G2T2
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	annual herb	Apr-Sep	1B.1	S1	G1
Orcuttia pilosa	hairy Orcutt grass	Poaceae	annual herb	May-Sep	1B.1	S1	G1
Pseudobahia bahiifolia	Hartweg's golden sunburst	Asteraceae	annual herb	Mar-Apr	1B.1	S2	G2
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
	caper-fruited	Brassicaceae	annual herb	Mar-Apr	1B.1	S1	G1

Tropidocarpum capparideum	tropidocarpum						
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	1B.1	S1	G1

Suggested Citation

California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 20 April 2020].

Search the Inventory
- Simple Search
- Advanced Search
- Glossary

Information
- About the Inventory
- About the Rare Plant Program
- CNPS Home Page
- About CNPS
- Join CNPS

Contributors
- The Calflora Database
- The California Lichen Society
- California Natural Diversity Database
- The Jepson Flora Project
- The Consortium of California Herbaria
- CalPhotos

Questions and Comments

rareplants@cnps.org

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Madera County, California

Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600
📠 (916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Fresno Kangaroo Rat Dipodomys nitratoides exilis There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5150	Endangered
San Joaquin Kit Fox Vulpes macrotis mutica No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2873	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard Gambelia silus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover Castilleja campestris ssp. succulenta There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/8095	Threatened
Hairy Orcutt Grass Orcuttia pilosa There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/2262	Endangered
San Joaquin Orcutt Grass Orcuttia inaequalis There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/5506	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
California Tiger Salamander Ambystoma californiense https://ecos.fws.gov/ecp/species/2076#crithab	Final
Fleshy Owl's-clover Castilleja campestris ssp. succulenta https://ecos.fws.gov/ecp/species/8095#crithab	Final

Hairy Orcutt Grass *Orcuttia pilosa* https://ecos.fws.gov/ecp/species/2262#crithab	Final
San Joaquin Orcutt Grass *Orcuttia inaequalis* https://ecos.fws.gov/ecp/species/5506#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Costa's Hummingbird Calypte costae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10

Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse Baeolophus inornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Song Sparrow Melospiza melodia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Feb 20 to Sep 5

Spotted Towhee Pipilo maculatus clementae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/4243	Breeds Apr 15 to Jul 20
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Wrentit Chamaea fasciata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (🟩)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (🟨)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

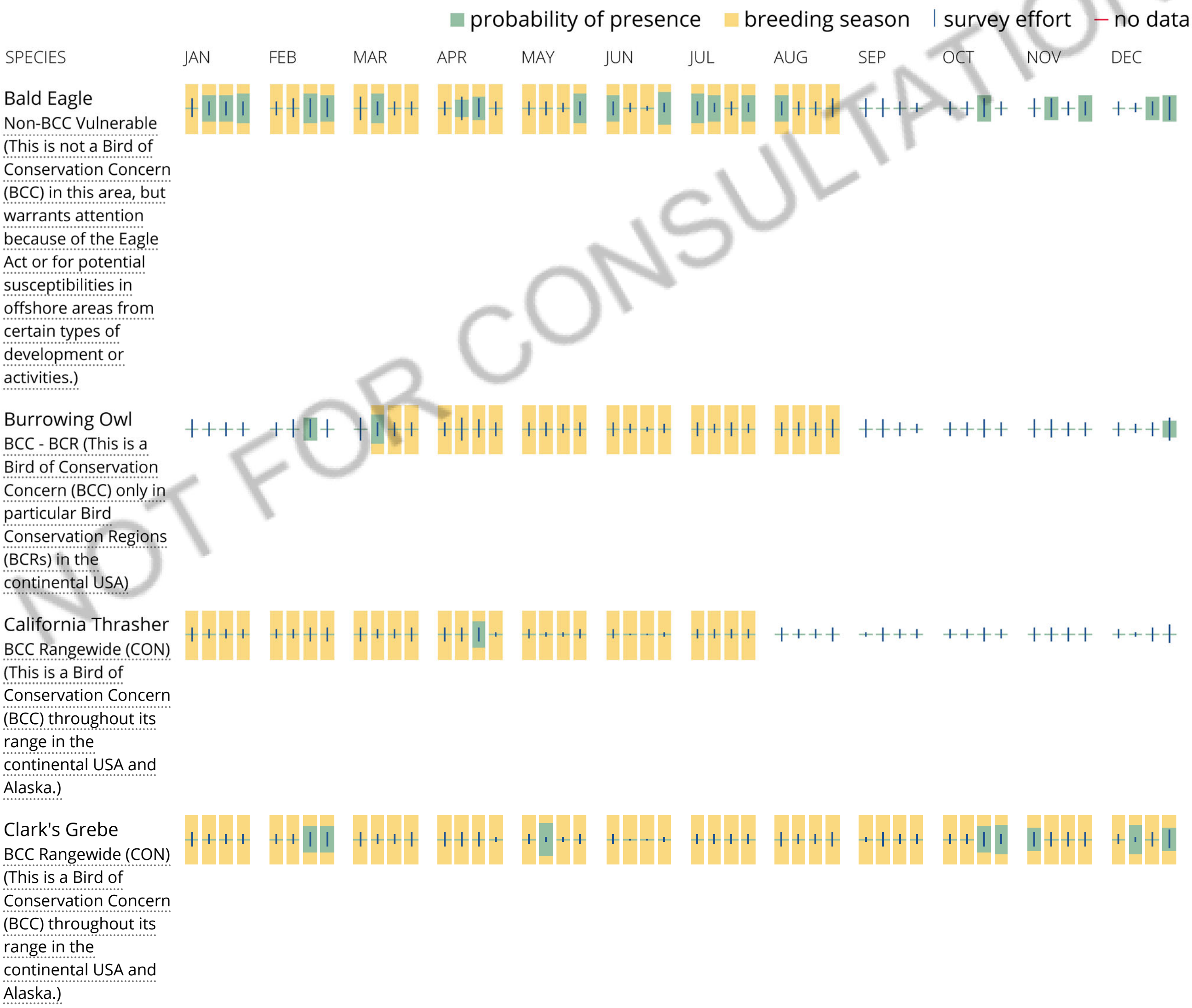
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

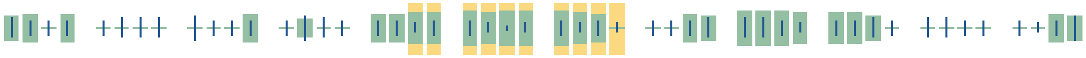
Burrowing Owl
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

California Thrasher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Clark's Grebe
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Common Yellowthroat

BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

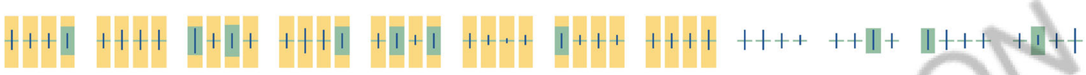


Costa's Hummingbird

BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

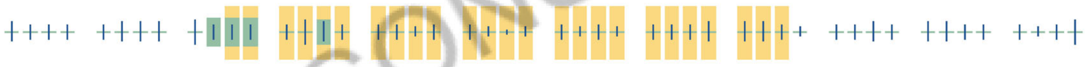
Golden Eagle

Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



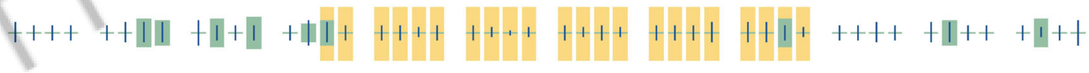
Lawrence's Goldfinch

BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



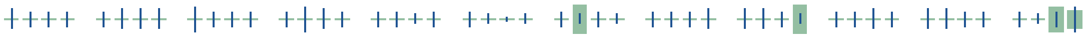
Lewis's Woodpecker

BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

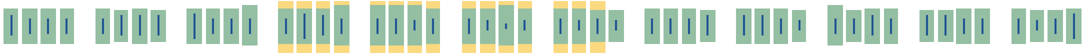


Long-billed Curlew

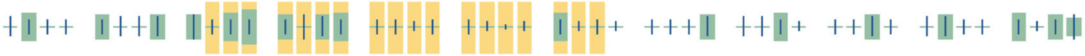
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

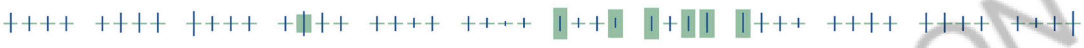


Oak Titmouse
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

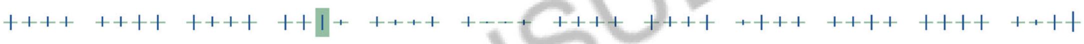


SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

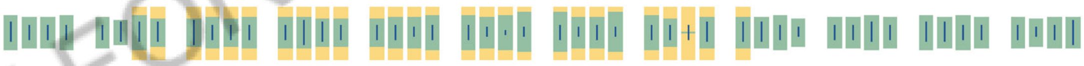
Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



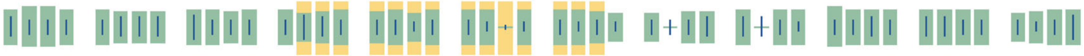
Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



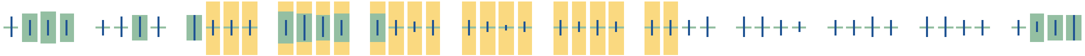
Song Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



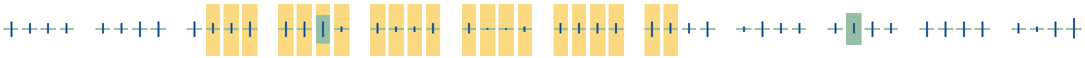
Spotted Towhee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Tricolored Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wrentit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE
    Riverine

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

ATTACHMENT B

Representative Site Photographs

Photo 1. Vernal pool within central portion of the Study Area, view southwest, April 18, 2017.

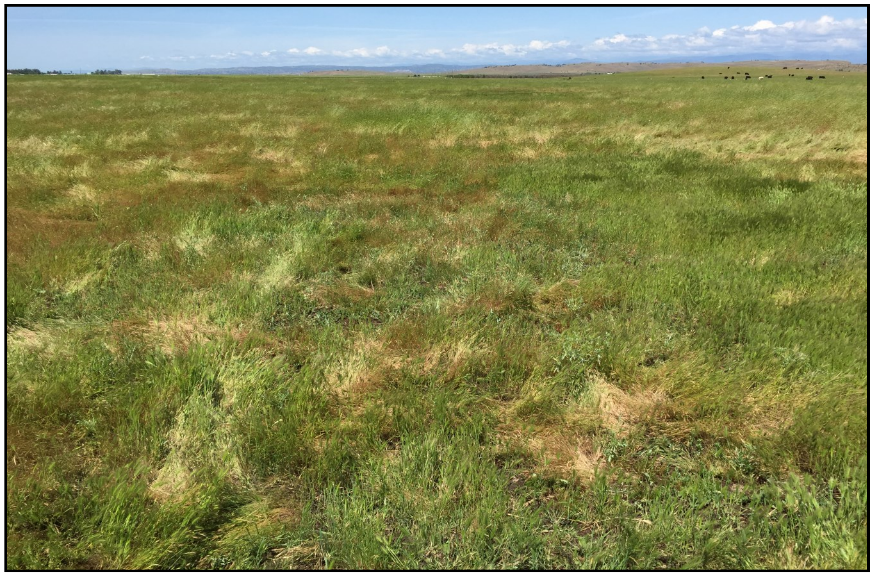


Photo 2. Overview of annual grassland within central portion of the Study Area, view southeast, April 19, 2017.

Photo 3. Disked agricultural field within southern portion of the Study Area, view south, April 19, 2017

Photo 4. Ruderal area and planted agricultural field within southern portion of the Study Area, view north, April 19, 2017.

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Representative Site Photographs

2017-089 Rio Mesa Boulevard

Photo 5. Seasonal wetland swale within northeastern portion of the Study Area, view west, April 18, 2017.

Photo 6. Seasonal wetland within southern portion of the Study Area, view north, April 20, 2017

Photo 7. Seasonal wetland swale within northwestern portion of the Study Area, view northeast, April 20, 2017.

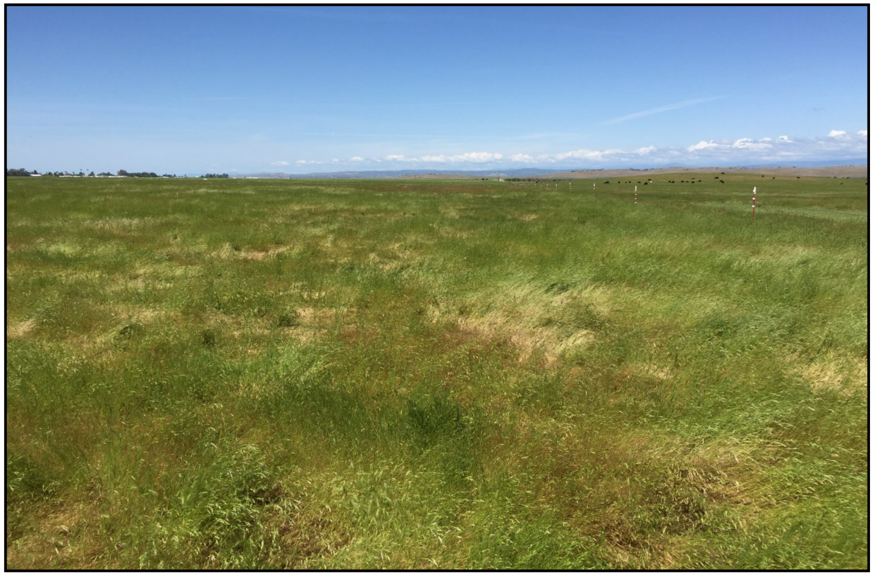


Photo 8. Overview of annual grassland within the northern portion of the Study Area, view east, April 19, 2017.

ATTACHMENT C

Wildlife Observed Onsite

Wildlife Observed On-Site
March 15 and April 18, 19, and 20, 2017

Common Name	Scientific Name
Amphibians	
Western toad	*Anaxyrus boreas*
Western spadefoot	*Spea hammondii*
Sierran tree frog	*Pseudacris sierra*
Reptiles	
Western fence lizard	*Sceloporus occidentalis*
Birds	
California quail	*Callipepla californica*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Turkey vulture	*Cathartes aura*
Northern harrier	*Circus cyaneus*
Swainson's hawk	*Buteo swainsoni*
Red-tailed hawk	*Buteo jamaicensis*
Golden eagle	*Aquila chrysaetos*
Killdeer	*Charadrius vociferus*
Mourning dove	*Zenaida macroura*
Anna's hummingbird	*Calypte anna*
American kestrel	*Falco sparverius*
Western kingbird	*Tyrannus verticalis*
American crow	*Corvus brachyrhynchos*
Common raven	*Corvus corax*
Cliff swallow	*Petrochelidon pyrrhonota*
Barn swallow	*Hirundo rustica*
Northern mockingbird	*Mimus polyglottos*
Common yellowthroat	*Geothlypis trichas*
Savannah sparrow	*Passerculus sandwichensis*
Red-winged blackbird	*Agelaius phoeniceus*
Tricolored blackbird	*Agelaius tricolor*
Western meadowlark	*Sturnella neglecta*
Brewer's blackbird	*Euphagus cyanocephalus*
House finch	*Haemorhous mexicanus*
Mammals	
Coyote	*Canis latrans*
Cottontail rabbit	*Sylvilagus* sp.
California ground squirrel	*Otospermophilus beecheyi*

APPENDIX F

Aquatic Resources Delineation - Rio Mesa Boulevard Project

(ECORP 2020)

Aquatic Resources Delineation

Rio Mesa Boulevard

Madera County, California

Prepared for:

Madera County

April 7, 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CWA	Clean Water Act
FR	Federal Register
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OHWM	Ordinary high water mark
PJD	Preliminary Jurisdictional Determination
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

1.0 INTRODUCTION

On behalf of Madera County, ECORP Consulting, Inc. conducted an aquatic resources delineation for the proposed Rio Mesa Boulevard (Study Area). The ±359.7-acre Study Area is located east of State Route 41 and west of the San Joaquin River, approximately eight miles northwest of the City of Clovis in Madera County, California (Figure 1. *Study Area Location and Vicinity*). The Study Area corresponds to portions of Sections 21, 22, 27, 28, 33, and 34, Township 11 South, Range 20 East, and portions of Sections 3 and 4, Township 12 South, Range 20 East (Mount Diablo Base and Meridian) of the "Lanes Bridge, California" 7.5-minute quadrangle (U.S. Geological Survey [USGS] 1964, photorevised 1973). The approximate center of the Study Area is located at latitude 36.940531° and longitude -119.782054° within the Middle San Joaquin-Lower Chowchilla Watershed (Hydrologic Unit Code #18040001, Natural Resources Conservation Service [NRCS], USGS, and U.S. Environmental Protection Agency [USEPA] 2016). Driving directions to the Study Area are included as Attachment A.

This report describes aquatic resources identified within the Study Area that may be regulated by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the federal Clean Water Act (CWA). The information presented in this report provides data required by the USACE Sacramento District's Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE 2016). The aquatic resource boundaries depicted in this report represent a calculated estimation of the jurisdictional area within the Study Area and are subject to modification following the USACE verification process.

The purpose of this report is to provide adequate information to USACE for the issuance of a Preliminary Jurisdictional Determination (PJD).

2.0 REGULATORY SETTING

2.1 Waters of the United States

This report describes aquatic resources, including wetlands that may be regulated by USACE under Section 404 of the federal CWA.

2.1.1 Wetlands

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [51 Federal

Register (FR) 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993]. Wetlands can be perennial or intermittent.

2.1.2 Other Waters

Other waters are nontidal, perennial, and intermittent watercourses and tributaries to such watercourses [51 FR 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993]. The limit of USACE jurisdiction for nontidal watercourses (without adjacent wetlands) is defined in 33 Code of Federal Regulations (CFR) 328.4(c)(1) as the "ordinary high water mark" (OHWM).

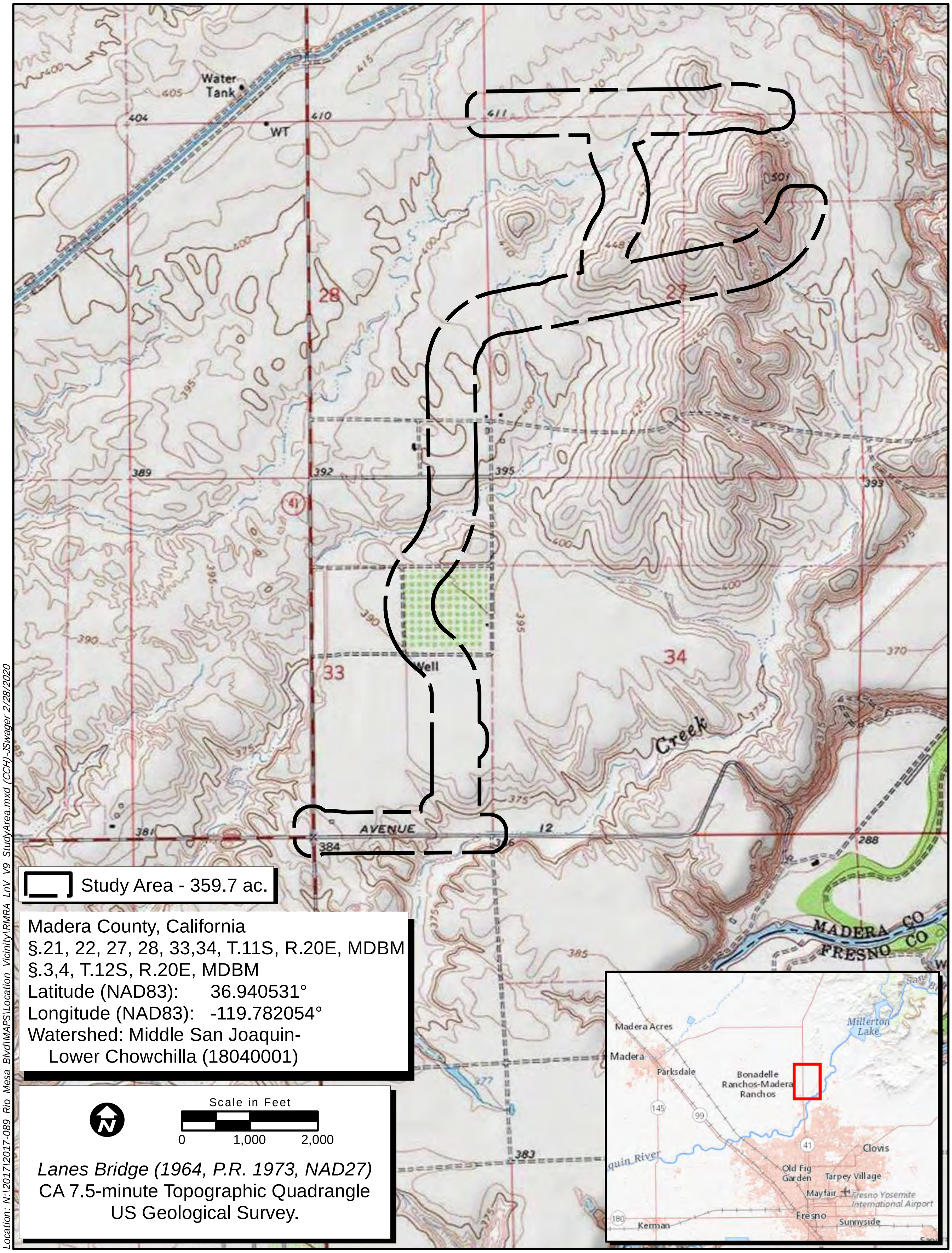
The OHWM is defined as the "*line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas*" approximating the lateral limit of USACE jurisdiction. The upstream limits of other waters are defined as the point where the OHWM is no longer perceptible.

2.2 Clean Water Act

The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines [33 CFR § 328.2(f)]. In addition, Section 401 of the CWA (33 U.S. Code 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands, over 0.5 acre of impact, may require an individual permit. Projects that only minimally affect wetlands, less than or equal to 0.5 acre of impact, may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; in California, this certification or waiver is typically issued by the Regional Water Quality Control Board.

Location: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Location_Vicinity\RMRA_LnV_V9_StudyArea.mxd (CCH)-JSwager 2/28/2020



▭ Study Area - 359.7 ac.

Madera County, California
§.21, 22, 27, 28, 33,34, T.11S, R.20E, MDBM
§.3,4, T.12S, R.20E, MDBM
Latitude (NAD83): 36.940531°
Longitude (NAD83): -119.782054°
Watershed: Middle San Joaquin-
Lower Chowchilla (18040001)

Lanes Bridge (1964, P.R. 1973, NAD27)
CA 7.5-minute Topographic Quadrangle
US Geological Survey.

Map Date: 2/28/2020

Sources: ESRI, USGS, Morton and Pitalo

Figure 1. Study Area Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2017-089 Rio Mesa Boulevard

2.3 Jurisdictional Assessment

Pursuant to the USEPA and USACE memorandum regarding CWA jurisdiction, issued following the United States Supreme Court's decision in the consolidated cases Rapanos v. United States and Carabell v. United States (herein referred to as Rapanos), the agencies will assert jurisdiction over the following waters: Traditional Navigable Waters (TNW), all wetlands adjacent to TNW, nonnavigable tributaries of TNW that are "relatively permanent" waters (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally), and wetlands that directly abut such tributaries (USEPA and USACE 2007).

Waters requiring a significant nexus determination by USACE and USEPA to establish jurisdiction include nonnavigable tributaries that are not relatively permanent, wetlands adjacent to nonnavigable tributaries that are not relatively permanent, and wetlands adjacent to but do not directly abut a relatively permanent nonnavigable tributary (USEPA and USACE 2007). The jurisdictional determination is a fact-based evaluation to establish whether a water has a significant nexus with TNW. The significant nexus analysis will assess the flow characteristics and functions of the nonnavigable tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNW (USEPA and USACE 2007).

3.0 METHODS

This aquatic resources delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008). The boundaries of aquatic resources were delineated through standard field methods (e.g., paired sample set analyses), and field data were recorded on Wetland Determination Data Forms - Arid West Region (Attachment B). A color aerial photograph (1"=400' scale, National Agricultural Imagery Program 2014) was used to assist with mapping and ground-truthing. *Munsell Soil Color Charts* (Kollmorgen Instruments Co. 1990), the Web Soil Survey (NRCS 2017a), and the National Hydric Soils List (NRCS 2017b) were used to aid in identifying hydric soils in the field. The Jepson Manual, 2nd Edition (Baldwin et al. 2012) was used for plant nomenclature and identification.

Field surveys were conducted on April 18, 19, and 20, and August 8 and 9, 2017, by ECORP biologists Clay DeLong, Emily Mecke, and Ariel Miller. Mr. DeLong, Ms. Mecke, and Ms. Miller walked meandering transects throughout the ±359.7-acre Study Area to determine the location and extent of aquatic resources within the Study Area. Field surveys were conducted in the spring and summer, during the blooming season for most of the hydrophytic plant species within the Study Area, and during an appropriate time of the year to observe indicators of wetland hydrology. Paired locations were sampled to evaluate whether or not the vegetation, hydrology, and soils data supported a determination of aquatic resource or non-aquatic resource status. At each paired location, one point was located such that it was within the estimated aquatic resource area, and the other point was situated outside the limits of the estimated aquatic resource area. Additional non-paired locations were sampled to document marginal areas that were determined not to be aquatic resources because they lacked hydrophytic vegetation, hydric soils, and/or wetland hydrology. Aquatic resources within the Study Area were mapped in the field using a post-processing capable global positioning system unit with sub-meter accuracy (Trimble GeoXT).

3.1 Routine Determinations for Wetlands

To be determined a wetland, the following three criteria must be met:

- A majority of dominant vegetation species are wetland-associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season; and
- Hydric soils are present.

3.1.1 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase "*a prevalence of vegetation typically adapted for life in saturated soil conditions*." Prevalent vegetation is characterized by the plant species that dominate the plant community (Environmental Laboratory 1987). The dominance test is the basic hydrophytic vegetation indicator and was applied at each sampling point location. The "50/20 rule" was used to select the dominant plant species from each stratum of the community. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional species that individually contribute 20 percent or more of the total cover in the stratum (Headquarters, USACE 1992; USACE 2008a).

Dominant plant species observed at each sampling point were then classified according to their indicator status (probability of occurrence in wetlands, Table 1), *North American Digital Flora: National Wetland Plant* List (Lichvar et al. 2016). If the majority (greater than 50 percent) of the dominant vegetation on a site were classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the site was considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species[1]

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	Almost always occur in wetlands
Facultative Wetland	FACW	Usually occur in wetlands, but may occur in nonwetlands
Facultative	FAC	Occur in wetlands and nonwetlands
Facultative Upland	FACU	Usually occur in nonwetlands, but may occur in wetlands
Upland	UPL	Almost never occur in wetlands
Plants That Are Not Listed (assumed upland species)	N/L	Does not occur in wetlands in any region.

[1]Source: Lichvar et al. 2016

In instances where indicators of hydric soil and wetland hydrology were present, but the plant community failed the dominance test, the vegetation was re-evaluated using the Prevalence Index. The Prevalence Index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighting is by abundance (percent cover). If the plant community failed the Prevalence Index, the presence/absence of plant morphological adaptations to prolonged inundation or saturation in the root zone was evaluated.

3.1.2 Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2003). Indicators that a hydric soil is present include, but are not limited to, histosols, histic epipedon, hydrogen sulfide, depleted below dark surface, sandy redox, loamy gleyed matrix, depleted matrix, redox dark surface, redox depressions, and vernal pools.

At each sampling point, a soil pit was excavated to the depth needed to document an indicator, to confirm the absence of indicators, or until refusal at each sampling point. The soil was then examined for hydric soil indicators. Soil colors were determined while the soil was moist using the *Munsell Soil Color Charts* (Kollmorgen Instruments Co. 1990). Hydric soils are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. These processes and the features in the soil that develop can be identified by looking at the color and texture of the soils.

3.1.3 Hydrology

Wetlands, by definition, are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include, but are not limited to: visual observation of saturated soils, visual observation of inundation, surface soil cracks, inundation visible on aerial imagery, water-stained leaves, oxidized rhizospheres along living roots, aquatic invertebrates, water marks (secondary indicator in riverine environments), drift lines (secondary indicator in riverine environments), and sediment deposits (secondary indicator in riverine environments). The occurrence of one primary indicator is sufficient to conclude that wetland hydrology is present. If no primary indicators are observed, two or more secondary indicators are required to conclude wetland hydrology is present. Secondary indicators include, but are not limited to drainage patterns, crayfish burrows, FAC-neutral test, and shallow aquitard. The occurrence of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology.

4.0 RESULTS

4.1 Existing Site Conditions

The Study Area and surrounding areas are characterized by agricultural uses including cultivated annual crops and annual grasslands used for livestock pasture. The Study Area is composed of gently rolling terrain in the north and flat terrain in the south, where the land has been leveled for agriculture. Elevation ranges within the Study Area from approximately 380 - 470 feet above mean sea level. A transmission line and transmission towers bisect the center of the Study Area.

The average winter low temperature in the vicinity of the Study Area is 37.2°F and average summer high temperature is 93.9°F. Average annual precipitation is approximately 12.23 inches, which falls as rain (National Oceanic and Atmospheric Administration [NOAA] 2017a). The rainy season leading up to April 18, 2017, when field work for this aquatic resources delineation began, was above average. Approximately 14.3 inches of rain had fallen in the vicinity of the Study Area between October 1, 2016 and April 18, 2017, which is approximately 125 percent of normal (NOAA 2017a, 2017b).

During the field visit, four terrestrial vegetation communities and land cover types were identified within the Study Area. These include annual grassland, agriculture, and ruderal. These vegetation communities and land cover types are described below. See Section 4.2 for detailed descriptions of the vegetation associated with aquatic resources within the Study Area.

4.1.1 Annual Grassland

The northern portion of the Study Area is characterized by nonnative annual grassland. These areas were primarily dominated by soft brome (*Bromus hordeaceous*). Other dominant species within the annual grasslands included Mediterranean barley (*Hordeum marinum*), foxtail barely (*Hordeum murinum*), and filaree (*Erodium botrys*).

4.1.2 Agriculture

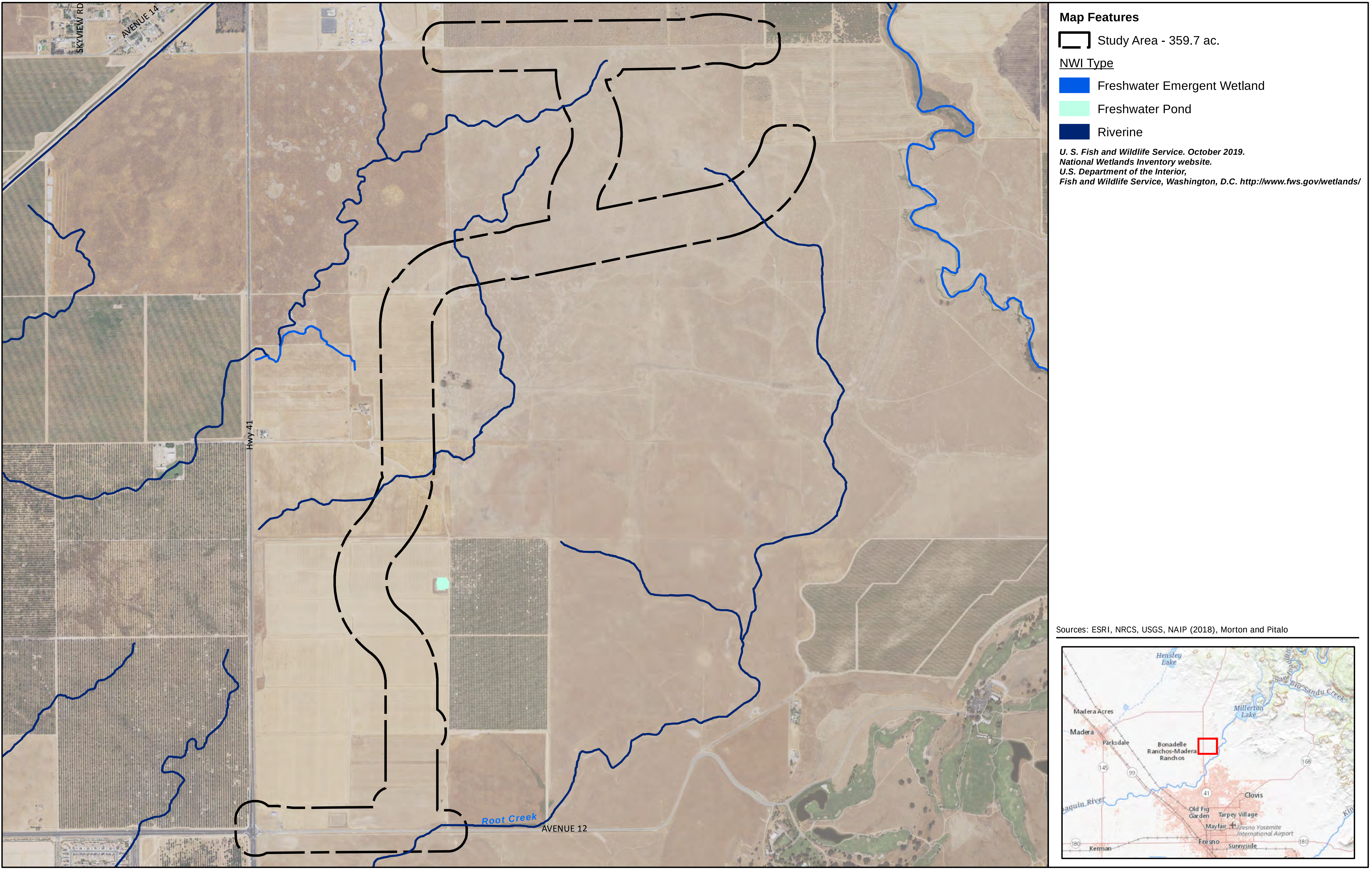
Agricultural fields occur at several locations in the central and southern portions of the Study Area. The agricultural fields were either disked or in active production. The disked agricultural fields are dominated by nonnative annual grasses and forbs including cultivated oat (*Avena sativa*), ripgut brome, soft brome, wild oat (*Avena fatua*), Italian ryegrass (*Festuca perennis*), brome fescue (*Festuca bromoides*), winter vetch (*Vicia villosa*), and yellow wild radish (*Raphanus raphanistrum*). The agricultural fields in active production were planted with cultivated oat, with winter vetch and yellow wild radish also present within the fields.

4.1.3 Ruderal

Ruderal areas throughout the Study Area are characterized by existing dirt roads or other disturbed areas. Ruderal areas were dominated by nonnative grasses and forbs consisting of ripgut brome, foxtail barley, rat-tail vulpia (*Festuca myuros*), purple wild radish (*Raphanus sativa*), and pineapple weed (*Matricaria discoidea*).

4.1.4 California Aquatic Resource Inventory

According to the National Wetlands Inventory, San Francisco Estuary Institute (2016), three riverine type features occur within the Study Area (Figure 2. *National Wetlands Inventory*). These features roughly correspond with seasonal wetland swales currently present onsite.



U. S. Fish and Wildlife Service. October 2019.
National Wetlands Inventory website.
U.S. Department of the Interior,
Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/

Sources: ESRI, NRCS, USGS, NAIP (2018), Morton and Pitalo

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\NWI\RMRA_NWI_20200227_StudyArea.mxd (JDS)-JSwager 2/28/2020

Map Date: 2/28/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 1,000

Figure 2. National Wetlands Inventory

2017-089 Rio Mesa Boulevard

4.1.5 Soils

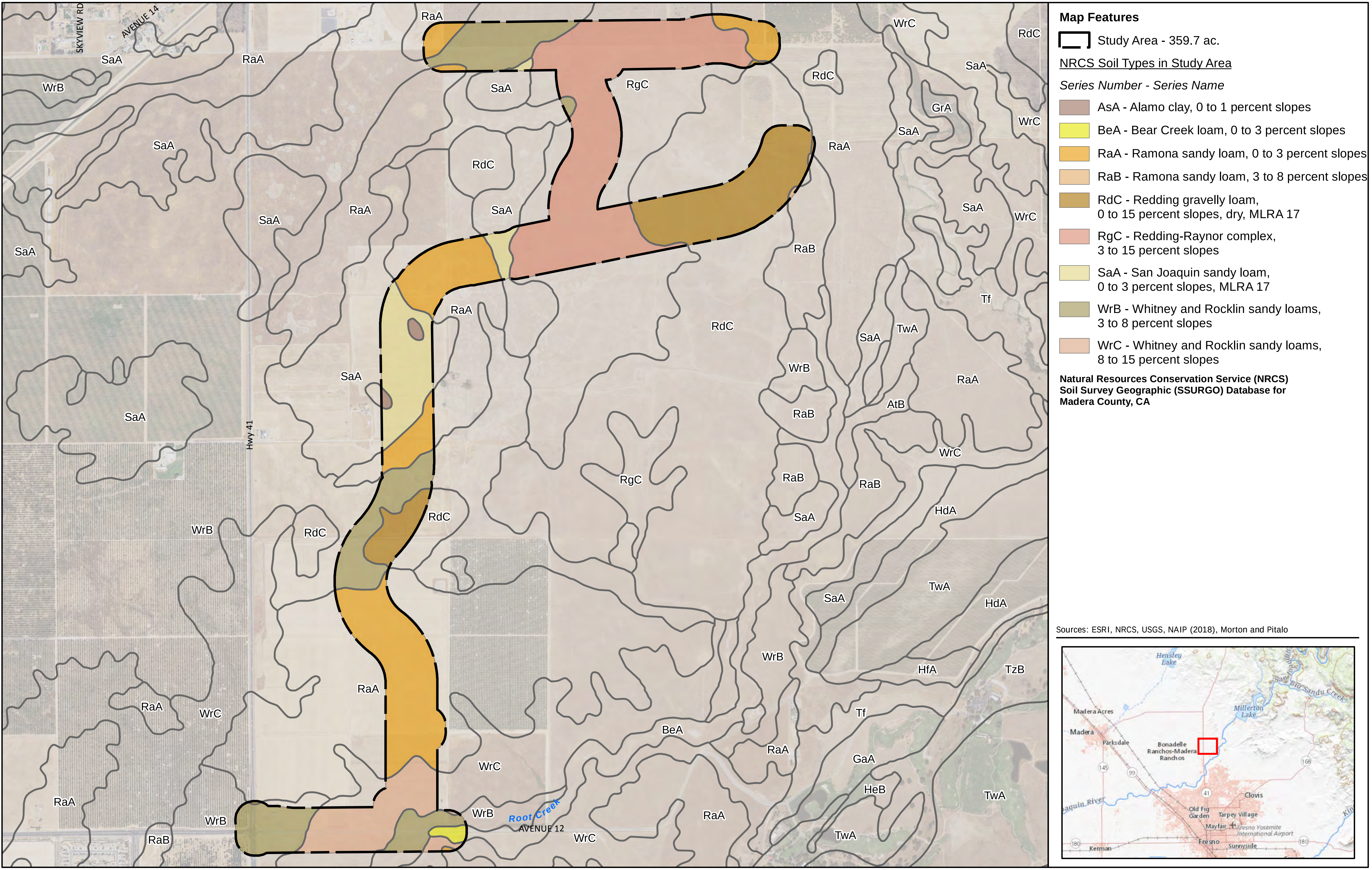
According to the NRCS Soil Survey Geographic Database for Madera County (NRCS 2017a), nine soil series have been mapped within the Study Area (Figure 3. *Natural Resources Conservation Service Soil Types*). These are:

- AsA – Alamo clay, 0 to 1 percent slopes;
- BeA – Bear Creek loam, 0 to 3 percent slopes;
- RaA – Ramona sandy loam, 0 to 3 percent slopes;
- RaB – Ramona sandy loam, 3 to 8 percent slopes;
- RdC – Redding gravelly loam, 0 to 15 percent slopes, dry, MLRA 17;
- RgC – Redding-Raynor complex, 3 to 15 percent slopes;
- SaA – San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17;
- WrB – Whitney and Rocklin sandy loams, 3 to 8 percent slopes;
- WrC – Whitney and Rocklin sandy loams, 8 to 15 percent slopes.

Alamo clay, 0 to 1 percent slopes (AsA) is partially composed of the Alamo component, which is considered hydric when occurring in fan remnants. Bear Creek loan, 0 to 3 percent slopes (BeA) contains unnamed components, which are considered hydric when occurring in floodplains. Ramona sandy loam, 0 to 3 percent slopes (RaA) and Ramona sandy loam, 3 to 8 percent slopes (RaB) contain unnamed components, which are considered hydric when occurring in depressions. Whitney and Rocklin sandy loams, 3 to 8 percent slopes (WrB) and Whitney and Rocklin sandy loams, 8 to 15 percent slopes (WrC) contain unnamed and ponded components, which are considered hydric when occurring in depressions. None of the remaining soil series contain hydric components (NRCS 2017b).

4.2 Aquatic Resources

A total of 7.548 acres of aquatic resources have been mapped within the Study Area (Table 2). The wetland determination data forms are included as Attachment B, and a list of plant species observed onsite is included as Attachment C. A discussion of the aquatic resources is presented below, and an aquatic resources delineation map is presented in Figure 4. *Aquatic Resources Delineation*. Representative site photographs are included as Attachment D. The USACE Operations and Maintenance Business Information Link Regulatory Module (ORM) aquatic resources table is included as Attachment E.



Map Features

Study Area - 359.7 ac.

NRCS Soil Types in Study Area

Series Number - Series Name

🟫 AsA - Alamo clay, 0 to 1 percent slopes

🟨 BeA - Bear Creek loam, 0 to 3 percent slopes

🟧 RaA - Ramona sandy loam, 0 to 3 percent slopes

🟧 RaB - Ramona sandy loam, 3 to 8 percent slopes

🟫 RdC - Redding gravelly loam, 0 to 15 percent slopes, dry, MLRA 17

🟥 RgC - Redding-Raynor complex, 3 to 15 percent slopes

🟨 SaA - San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17

🟩 WrB - Whitney and Rocklin sandy loams, 3 to 8 percent slopes

🟫 WrC - Whitney and Rocklin sandy loams, 8 to 15 percent slopes

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for Madera County, CA

Sources: ESRI, NRCS, USGS, NAIP (2018), Morton and Pitalo

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Soils_and_Geology\Soils\RMRA_Soils_V7_20200227_StudyArea.mxd (JDS)-JSwager 2/28/2020

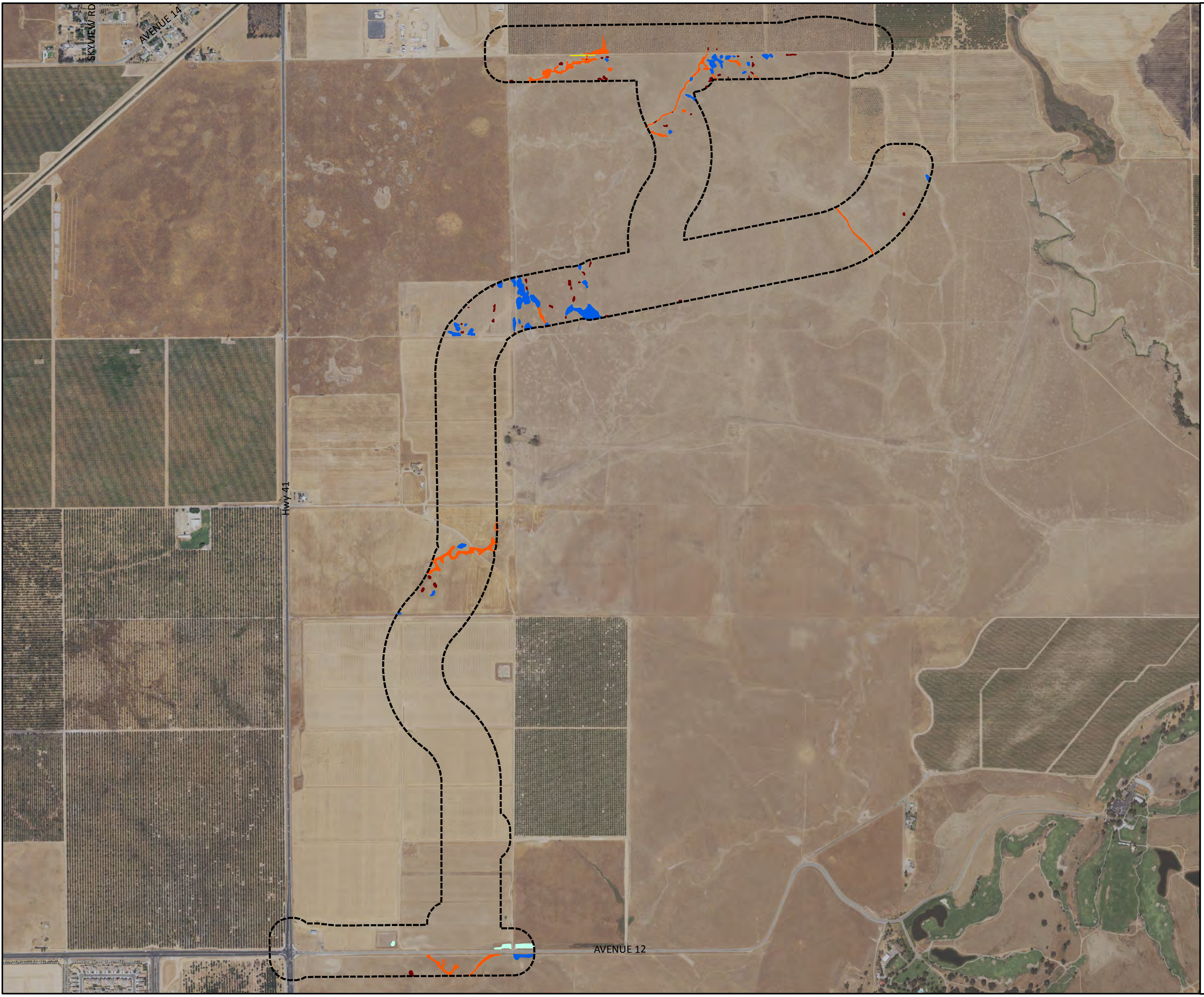
Map Date: 2/28/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 1,000

Figure 3. Natural Resources Conservation Service Soil Types

2017-089 Rio Mesa Boulevard



Map Features

- ⬚ Study Area - 359.7 ac.

Aquatic Resources Delineation - 7.548 ac. [1] *

Wetlands - 7.099 ac.

- 🟦 Vernal Pool - 3.467 ac.
- 🟥 Seasonal Wetland - 0.671 ac.
- 🟧 Seasonal Wetland Swale - 2.961 ac.

Other Waters - 0.449 ac.

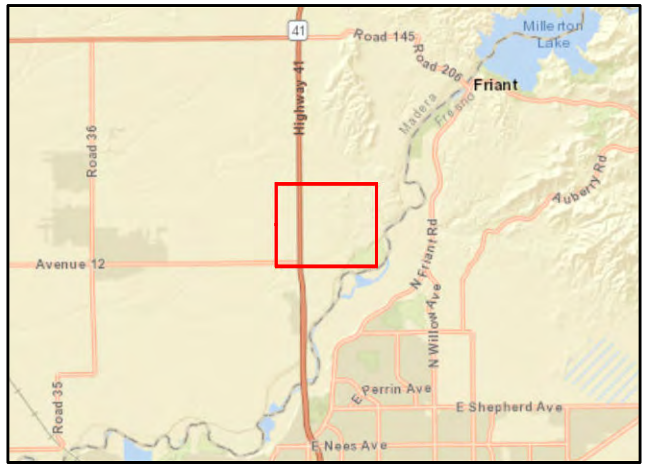
- ▨ Detention Basin - 0.420 ac.
- 🟨 Ditch - 0.028 ac.

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

---

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.

** The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.*



Map Date: 3/2/2020

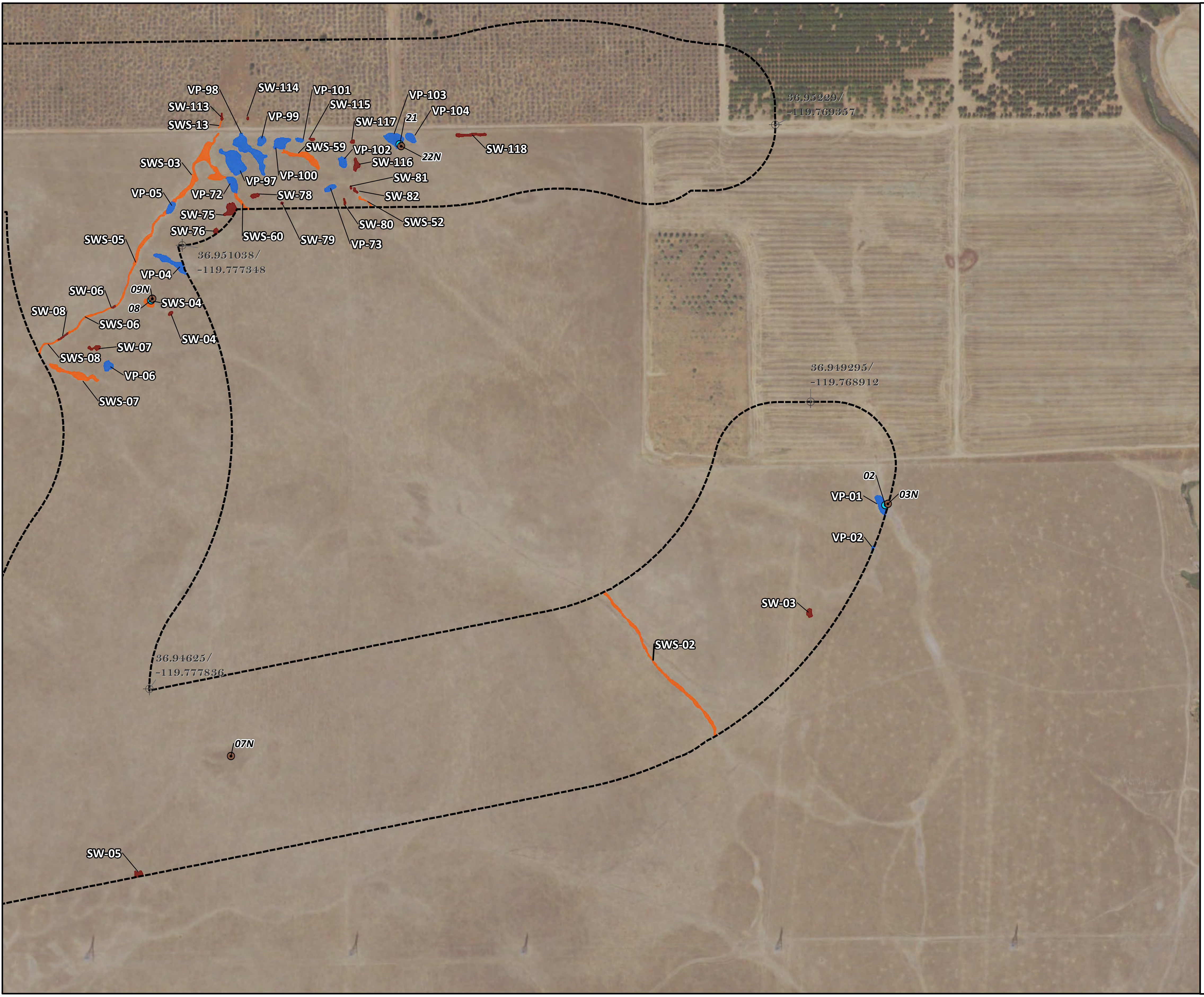
Scale in Feet
0 1,000

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4. Aquatic Resources Delineation (Overview)

2017-089 Rio Mesa Boulevard

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_20200227_Overview.mxd (JDS)-JSwager 3/2/2020



ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_20200227_MapBook.mxd (JDS)-JSwager 3/2/2020

Map Features

⬚	Study Area - 359.7 ac.
⌖	Reference Coordinate (NAD83)

Sample Points

●	Waters Point
●	Upland Point

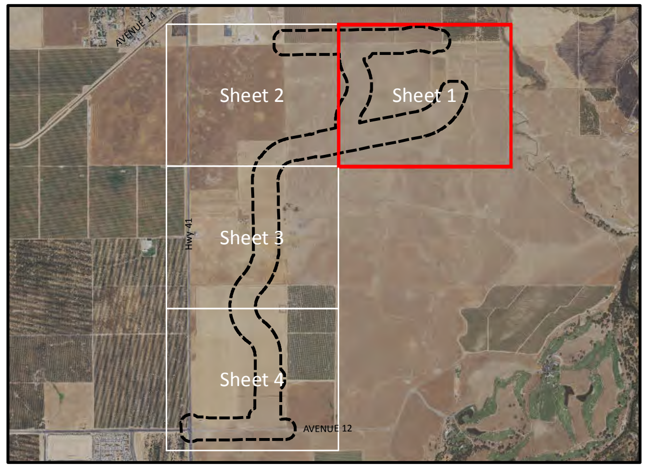
Aquatic Resources Delineation [1]

Wetlands

🟦	Vernal Pool
🟥	Seasonal Wetland
🟧	Seasonal Wetland Swale

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.



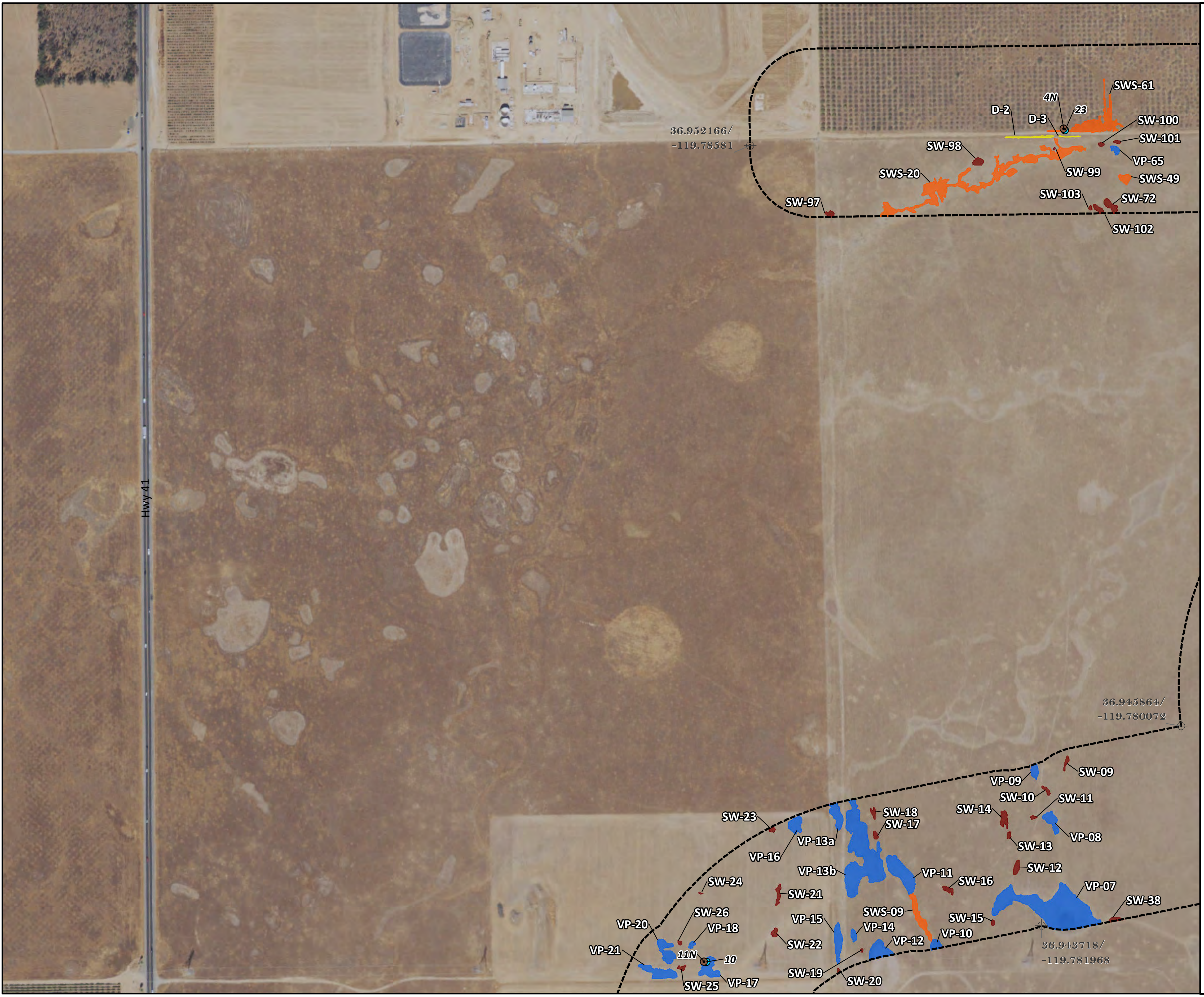
Map Date: 3/2/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 400

Figure 4. Aquatic Resources Delineation (Sheet 1 of 4)

2017-089 Rio Mesa Boulevard



Map Features

▭ Study Area - 359.7 ac.

⌖ Reference Coordinate (NAD83)

Sample Points

◉ Waters Point

● Upland Point

Aquatic Resources Delineation [1]

Wetlands

🟦 Vernal Pool

🟥 Seasonal Wetland

🟧 Seasonal Wetland Swale

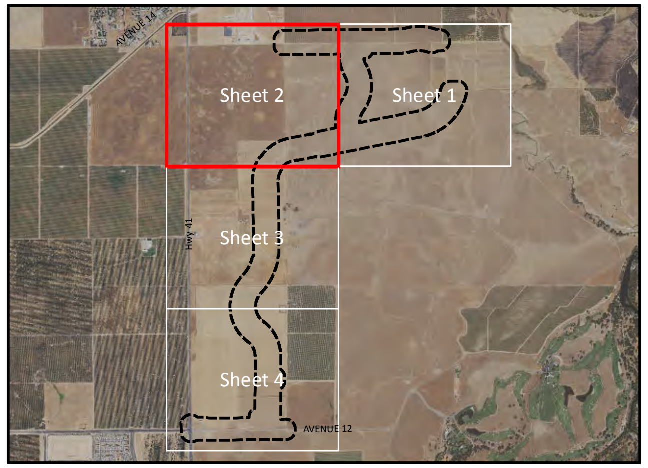
Other Waters

🟨 Ditch

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

---

[1] *Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.*



ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_20200227_MapBook.mxd (JDS)-JSwager 3/2/2020

Map Date: 3/2/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 400

Figure 4. Aquatic Resources Delineation
(Sheet 2 of 4)

2017-089 Rio Mesa Boulevard Road Alignment

ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_20200227_MapBook.mxd (JDS)-JSwager 3/2/2020

Map Features

▭ Study Area - 359.7 ac.

⌖ Reference Coordinate (NAD83)

Sample Points

● Waters Point

● Upland Point

Aquatic Resources Delineation [1]

Wetlands

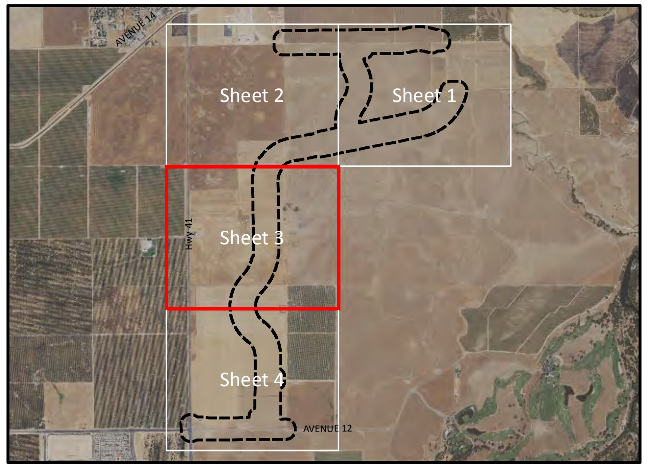
🟦 Vernal Pool

🟥 Seasonal Wetland

🟧 Seasonal Wetland Swale

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.



Map Date: 3/2/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 400

Figure 4. Aquatic Resources Delineation
(Sheet 3 of 4)

2017-089 Rio Mesa Boulevard

Map Features

⬚ Study Area - 359.7 ac.

⌖ Reference Coordinate (NAD83)

Sample Points

◉ Waters Point

● Upland Point

Aquatic Resources Delineation [1]

Wetlands

🟦 Vernal Pool

🟥 Seasonal Wetland

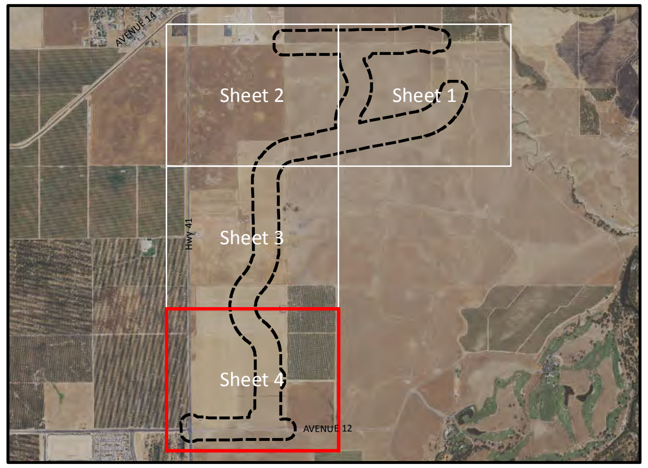
🟧 Seasonal Wetland Swale

Other Waters

🟩 Detention Basin

Photo Source: NAIP (2018)
Boundary Source: Morton and Pitalo
Delineator(s): Caly DeLong, Emily Mecke, Ariel Miller
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

[1] *Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.*



ECORP: N:\2017\2017-089_Rio_Mesa_Blvd\MAPS\Jurisdictional_Delineation\ACoE_Delineation\v5\RMB_ARD_20200227_MapBook.mxd (JDS)-JSwager 3/2/2020

Map Date: 3/2/2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 400

Figure 4. Aquatic Resources Delineation
(Sheet 4 of 4)
2017-089 Rio Mesa Boulevard

Table 2. Aquatic Resources

Type	Acreage[1]
Wetlands	
Vernal pool	3.467
Seasonal wetland	0.671
Seasonal wetland swale	2.961
Other Waters	
Detention basin	0.420
Ditch	0.028
Total:	7.548

[1] Acreages represent a calculated estimation and are subject to modification following the USACE verification process.

4.2.1 Wetlands

4.2.1.1 Vernal Pool

In general, vernal pools are topographic basins underlain with an impermeable or semi-permeable hardpan or duripan layer. Direct rainfall and surface runoff inundate the pools during the wet season. The pools remain inundated and/or saturated through spring, and they are typically dry by late spring until the following wet season. Vernal pools occur throughout the northern and central portions of the Study Area.

Vernal pools within the Study Area were variously dominated by creeping spikerush (*Eleocharis macrostachya*), slender popcorn-flower (*Plagiobothrys stipitatus*), dwarf woolly-heads (*Psilocarphus brevissimus*), Mediterranean barley, Solano downingia (*Downingia ornatissima*), hyssop loosestrife (*Lythrum hyssopifolia*), water pygmy-weed (*Crassula aquatica*), larger water-starwort (*Callitriche heterophylla*), and least spikerush (*Eleocharis acicularis* var. *acicularis*). Sampling points 02, 10, and 21 were collected within vernal pools.

Soil matrix colors within onsite vernal pools ranged from 7.5YR 4/1 to 7.5YR 4/2, with redox features ranging in color from 5YR 4/6 to 7.5YR 5/8. Soils within vernal pools were determined to be hydric based on the presence of hydric soil indicators F3 (Depleted Matrix) and F8 (Redox Depressions). Wetland hydrology indicators observed within vernal pools included B7 (Inundation Visible on Aerial Imagery) and B12 (Biotic Crust).

4.2.1.2 Seasonal Wetland

Seasonal wetlands are ephemerally wet due to the accumulation of surface runoff and rainwater within low-lying areas. Inundation periods tend to be relatively short and seasonal wetlands are commonly dominated by nonnative annual, and sometimes perennial, hydrophytic species. Seasonal wetlands occur scattered throughout the Study Area. Seasonal wetlands were primarily dominated by Mediterranean barley, hyssop loosestrife, toad rush (*Juncus bufonius*), and Greene's popcorn-flower (*Plagiobothrys greenei*). Sampling points 12 and 14 were collected within seasonal wetlands.

Soil matrix colors within onsite seasonal wetlands ranged from 7.5YR 4/4 to 10YR 4/2, with redox features colored 5YR 4/6. Soils within seasonal wetlands were determined to be hydric based on the presence of hydric soil indicator F3 (Depleted Matrix). Soils within seasonal wetland SW-31 at sampling point 12 did not meet the criteria for any hydric soil indicator. However, this feature appears to have formed recently within a man-made depression created by farming equipment. It is likely that soils within this feature are saturated or ponded for sufficient time during the growing season to meet the definition of hydric soils, but that this feature has not existed long enough to meet the criteria for any hydric soil indicators. Wetland hydrology indicators observed within onsite seasonal wetlands included B12 (Biotic Crust).

4.2.1.3 Seasonal Wetland Swale

Seasonal wetland swales are linear wetland features that do not exhibit an OHWM. These are typically inundated for short periods during and immediately after rain events, but usually maintain soil saturation for longer periods during the wet season. Several seasonal wetland swales were mapped throughout the Study Area. Seasonal wetland swales were primarily dominated by Mediterranean barely with other dominants including slender popcorn-flower, dwarf woolly-heads, button-celery (*Eryngium castrense*), and annual bluegrass (*Poa annua*). Sampling points 04, 08, 16, and 23 were collected within seasonal wetland swales.

Soil matrix colors within onsite seasonal wetland swales ranged from 10YR 3/1 to 10YR 4/2, with redox features ranging in color from 5YR 4/6 to 7.5YR 5/6. Soils within seasonal wetland swales were determined to be hydric based on the presence of hydric soil indicators A11 (Depleted Below Dark Surface), F3 (Depleted Matrix), and F6 (Redox Dark Surface). Wetland hydrology indicators observed within seasonal wetland swales included B12 (Biotic Crust) and B13 (Aquatic Invertebrates).

4.2.2 Other Waters

4.2.2.1 Ditch

Ditches are linear features constructed to convey stormwater and/or irrigation water. Two ditches are present alongside the northern dirt road within the Study Area. These ditches are relatively shallow and exhibit an OHWM. These ditches were primarily dominated by curly dock (*Rumex crispus*) and annual rabbit-foot grass (*Polypogon monspeliensis*).

4.2.2.2 Detention Basin

Detention basins are depressional and generally isolated features which can be perennial or ephemeral. Three detention basins are present in the southern portion of the Study Area. The detention basins were primarily dominated by Mediterranean barley (*Hordeum marinum*) and button-celery (*Eryngium castrense*). Sampling point 14 was collected within a detention basin. Soil matrix color within this detention basin was 10YR 4/2, with redox features having a 5YR 4/6 color. Soils within this detention basin was determined to be hydric based on the presence of hydric soil indicator F3 (Depleted Matrix). The wetland hydrology indicator observed within the detention basin was B12 (Biotic Crust).

5.0 CONCLUSION

A total of 7.548 acres of aquatic resources have been mapped within the Study Area. GIS shapefiles of the aquatic features are included in Attachment F. This acreage represents a calculated estimation of the extent of aquatic resources within the Study Area and is subject to modification following USACE review and/or the verification process. The placement of dredged or fill material into jurisdictional features would require a permit pursuant to Section 404 of the CWA and certification or waiver in compliance with Section 401 of the CWA.

6.0 REFERENCES

Baldwin, B. G., D.H Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual; Vascular Plants of California*, Second Edition. University of California Press, Berkeley, California. 1,519 pp. + app.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U. S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Headquarters, USACE. 1992. *Clarification and Interpretation of the 1987 Manual*. Memorandum from Major General Arthur E. Williams. Dated March 6, 1992.

Kollmorgen Instruments Company. 1990. *Munsell Soil Color Charts*. Kollmorgen Corporation. Baltimore, Maryland.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

National Agricultural Imagery Program. 2014. Orthorectified aerial photographs.

NOAA. 2017a. NCDC 1981-2010 Climate Normals for Madera, California. Available Online: https://www.ncdc.noaa.gov/cdo-web/datatools/normals. Accessed 4 October 2017

_____. 2017b. Daily Summaries for Madera, California. Available Online: https://www.ncdc.noaa.gov/cdo-web/. Accessed 4 October 2017

NRCS. 2017a. Soil Survey Geographic Database. Available Online: https://sdmdataaccess.sc.egov.usda.gov/. Accessed 18 September 2017.

_____.2017b. Soil Data Access Hydric Soils List. Available at https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed 22 May 2017.

_____. 2003. *National Soil Survey Handbook*, title 430-VI. Available Online: http://soils.usda.gov/technical/handbook.

NRCS, USGS, and USEPA. 2016. Watershed Boundary Dataset for Placer County, California. Available online: http://datageteway.nrcs.usda.gov. Accessed 23 May 2017.

"Navigation and Navigable Waters," Title 33 Code of Federal Regulations, Pt. 328. 2014 ed.

San Francisco Estuary Institute. 2016. "California Aquatic Resource Inventory (CARI) version 0.2." Available online: http://www.sfei.org/data/california-aquatic-resource-inventory-cari-version-02-gis-data

USACE. 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports.* Sacramento District. Dated January 2016.

_____. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-06-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USEPA and USACE. 2007. Memorandum Re: Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. Dated June 5, 2007.

USGS. 1964. Photorevised 1973. “Lanes Bridge, California” 7.5-minute Quadrangle. Geological Survey. Denver, Colorado.

LIST OF ATTACHMENTS

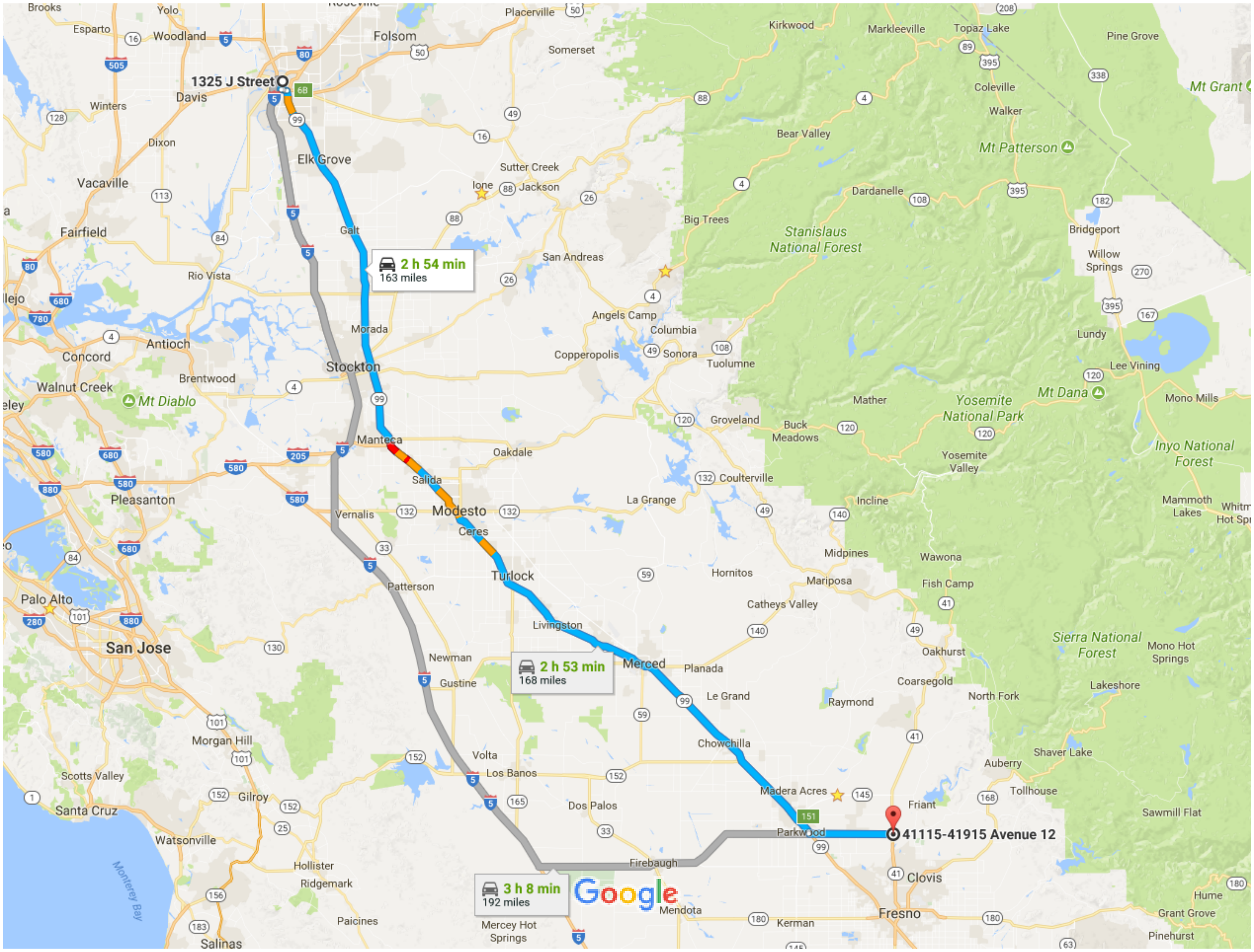
ATTACHMENT A

Driving Directions to Study Area

Google Maps

1325 J Street, Sacramento, CA to 41115-41915 Ave 12, Madera, CA 93636

Drive 163 miles, 2 h 54 min



Map data ©2017 Google United States 10 mi

1325 J St

Sacramento, CA 95814

Get on I-305 E/I-80BL E from 15th St

6 min (1.6 mi)

↑ 1. Head east on J St toward 14th St

0.1 mi

↱ 2. Use the right 2 lanes to turn right onto 15th St

1.1 mi

↰ 3. Use the left 2 lanes to turn left onto X St

407 ft

4. Use the middle 2 lanes to turn slightly left onto the I-80 E ramp

0.3 mi

Follow CA-99 S to your destination in Madera County. Take exit 151 from CA-99 S

2 h 13 min (148 mi)

5. Merge onto I-305 E/I-80BL E

0.3 mi

6. Use the right lane to take exit 6B for Interstate 80 Business East toward Reno/CA-99 S/Fresno

0.3 mi

7. Keep right at the fork, follow signs for CA-99 S and merge onto CA-99 S

147 mi

8. Take exit 151 toward Ave 12/Rd 29

0.3 mi

9. Turn left onto Ave 12

17 min (12.8 mi)

41115-41915 Ave 12

Madera, CA 93636

ATTACHMENT B

Wetland Determination Data Forms - Arid West

WETLAND DETERMINATION DATA FORM – Arid West Region

Study Area/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 02

Investigator(s): C. DeLong, E. Mecke,A. Miller Section, Township, Range: S27, T11S, R20E

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

Subregion (LRR): C - Mediterranean California Lat: 36.948172 Long: -119.767916 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 3-8% slopes NWI classification: ______

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:

Sampling point taken within a vernal pool. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Plagiobothrys stipitatus	15	Y	FACW
2. Psilocarphus brevissimus	10	Y	FACW
3. Crassula aquatica	1		OBL
4. Eleocharis macrostachya	5		OBL
5. Lythrum hyssopifolium	<1		OBL
6. Hordeum marinum	10	Y	FAC
7.			
8.			
	52 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 59 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 02

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5 YR 4/1	100						Sandy clay
1-5	7.5YR 4/1	85	7.5YR 5/8	15	C	M		Clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 5

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 03N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 36.948187 Long: -119.767884 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 3-8% slopes NWI classification: ______

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:

Upland adjacent to vernal pool sampling point 02. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	60	Y	FACU
2. Hordeum marinum	20	Y	FAC
3. Erodium botrys	<1		FACU
4. Hypochaeris radicata	<1		FACU
5. Bromus madritensis ssp. rubens	<1		UPL
6.			
7.			
8.			
= Total Cover	80		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 03N

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 Features %	Type[1]	Loc[2]	Texture	Remarks
0-0.5	10YR 3/2	100						Sandy clay
0.5-3	10YR 4/2	90	7.5YR 5/6	10	C	M		Sandy clay

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 3

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017
Applicant/Owner: Madera County State: CA Sampling Point: 04
Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
Subregion (LRR): C - Mediterranean California Lat: 36.94791 Long: -119.767749 Datum: NAD83
Soil Map Unit Name: Ramona sandy loam, 3-8% slopes NWI classification: ______
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:

Sampling point taken within a seasonal wetland swale. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Hordeum marinum	55	Y	FAC
2. Plagiobothrys stipitatus	15	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 04

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-0.5	10YR 3/1	100						Clay
0.5-3	10YR 4/2	95	7.5YR 5/6	5	C	M		Clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 3

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ 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 Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ 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)
- ___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 05N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 36.947887 Long: -119.767757 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 3-8% slopes NWI classification: ______

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 ✓	**Is the Sampled Area within a Wetland?** Yes ______ No ✓
Hydric Soil Present?	Yes ✓	No ______	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks:

Upland adjacent to seasonal wetland swale sampling point 04. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/A)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	38	Y	FACU
2. Hordeum marinum	42	Y	FAC
3. Festuca bromoides	<1		FACU
4. Festuca perennis	<1		FAC
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 05N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-0.5	10YR 3/1	100						Clay
0.5-3	10YR 4/2	95	7.5YR 5/6	5	C	M		Clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 3

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 06N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E

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

Subregion (LRR): C - Mediterranean California Lat: 36.947466335 Long: -119.767462609 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 3-8% slopes NWI classification: _____

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:

Sampling point is within a slight depression in the landscape, but lacks hydrophytic vegetation and wetland hydrology. Non-wetland. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Cynodon dactylon	35	Y	FACU
2. Bromus hordeaceous	15	Y	FACU
3. Festuca bromoides	<1		FACU
4. Crassula tillaea	3		FACU
5. Erodium botrys	7		FACU
6.			
7.			
8.			
= Total Cover	61		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 06N

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-3	10YR 4/2	95	7.5YR 4/6	5	C	M		Sandy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 3

Hydric Soil Present? **Yes** ✓ **No** ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 07N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 15

Subregion (LRR): C - Mediterranean California Lat: 36.945519 Long: -119.776746 Datum: NAD83

Soil Map Unit Name: Redding-Raynor complex, 3-15% slopes NWI classification: ______

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:

Convex slope (non-wetland) that appears as a wetland signature on aerial photos. Several similar signatures occur in this vicinity. They appear to be associated with small inclusions of clay soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/A)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Medicago polymorpha	30	Y	FACU
2. Erodium botrys	10		FACU
3. Hordeum murinum	20	Y	FACU
4. Plagiobothrys greenei	5		FACW
5. Festuca perennis	5		FAC
6. Trifolium tomentosum	5		N/L
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 07N

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-1.5	7.5YR 3/2	100						Clay
1.5-12	5YR 3/3	100						Clay

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ______ **No** ✓

Remarks:

Hydric soil absent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017
Applicant/Owner: Madera County State: CA Sampling Point: 08
Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): C - Mediterranean California Lat: 36.950446 Long: -119.777771 Datum: NAD83
Soil Map Unit Name: Redding-Raynor complex, 3-15% slopes NWI classification: ______
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:

Sampling point taken within a seasonal wetland. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Hordeum marinum	45	Y	FAC
2. Eryngium castrense	5		OBL
3. Plagiobothrys stipitatus	1		FACW
4. Lythrum hyssopifolium	5		OBL
5. Psilocarphus brevissimus	1		FACW
6. Trifolium subterraneum	5		N/L
7.			
8.			
= Total Cover	62		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust 10

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% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ✓** **No ______**

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 08

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/1	85	5YR 4/6	15	C	M, PL		Sandy clay
								Clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 4

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ 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 Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ 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)
- ___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/18/2017

Applicant/Owner: Madera County State: CA Sampling Point: 09N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 36.950463 Long: -119.777754 Datum: NAD83

Soil Map Unit Name: Redding-Raynor complex, 3-15% slopes NWI classification: ______

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:

Upland adjacent to seasonal wetland sampling point 08. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	20	Y	FACU
2. Hordeum marinum	30	Y	FAC
3. Festuca perennis	1		FAC
4. Erodium botrys	5		FACU
5. Juncus bufonius	10		FACW
6. Festuca bromoides	10		FACU
7.			
8.			
= Total Cover	76		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 09N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/1	85	5YR 4/6	15	C	M, PL		Sandy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present. Redox present in pore linings along dead roots only.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/19/2017

Applicant/Owner: Madera County State: CA Sampling Point: 10

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S28, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: 36.943358 Long: -119.786481 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 0-3% slopes NWI classification: ______

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:

Sampling point taken within a vernal pool. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Mimulus tricolor	3		OBL
2. Eryngium castrense	10	Y	OBL
3. Lythrum hyssopifolium	20	Y	OBL
4. Psilocarphus brevissimus	1		FACW
5. Pilularia americana	3		OBL
6. Plagiobothrys stipitatus	1		FACW
7. Crassula aquatica	1		OBL
8. Lepidium nitidum	1		FAC
= Total Cover	40		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 10

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 4/2	95	5YR 4/6	5	C	M, PL		Clay loam

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 5

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/19/2017

Applicant/Owner: Madera County State: CA Sampling Point: 11N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S28, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): C - Mediterranean California Lat: 36.94336 Long: -119.786513 Datum: NAD83

Soil Map Unit Name: Ramona sandy loam, 0-3% slopes NWI classification: ______

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:

Upland adjacent to vernal pool sampling point 10. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	30	Y	FACU
2. Festuca bromoides	40	Y	FACU
3. Hordeum marinum	10		FAC
4. Erodium botrys	10		FACU
5. Juncus bufonius	10		FACW
6. Trifolium depauperatum	<1		FAC
7.			
8.			
= Total Cover	100		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 11N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/2	95	5YR 4/6	5	C	M, PL		Clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 4

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

Hydric soil present. Redox in pore linings occurs only along dead roots.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ 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 Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ 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)
- ___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 12

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

Landform (hillslope, terrace, etc.): Graded agricultural field Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: 36.924503 Long: -119.789582 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 8-15% slopes NWI classification: ______

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 ______	Is the Sampled Area within a Wetland? Yes ✓ No ______
Hydric Soil Present?	Yes ✓ No ______	
Wetland Hydrology Present?	Yes ✓ No ______	

Remarks:

Sampling point taken within a recently formed seasonal wetland. Feature formed in depression created by heavy machinery activity at edge of agricultural field. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Plagiobothrys greenei	20	Y	FACW
2. Plagiobothrys stipitatus	10	Y	FACW
3. Psilocarphus brevissimus	1		FACW
4. Croton setiger	<1		N/L
5. Lythrum hyssopifolium	<1		OBL
6. Spergularia rubra	1		FAC
7.			
8.			
= Total Cover	32		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 68 % Cover of Biotic Crust 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 12

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 Features %	Type[1]	Loc[2]	Texture	Remarks
0-1.5	10YR 4/2	100						Clay loam
1.5-7	7.5YR 4/4	100						Sandy clay loam

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 7

Hydric Soil Present? Yes _✓_ No ___

Remarks:

Recently formed wetland. Cannot rule out hydric soil conditions despite lack of redoximorphic features.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 13N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

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

Subregion (LRR): C - Mediterranean California Lat: 36.924493 Long: -119.789593 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 8-15% slopes NWI classification: ______

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:

Upland adjacent to recently formed seasonal wetland sampling point 12. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	30	Y	FACU
2. Festuca bromoides	50	Y	FACU
3. Bromus madritensis ssp. rubens	10		UPL
4. Erodium cicutarium	<1		N/L
5.			
6.			
7.			
8.			
= Total Cover	90		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 13N

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 Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/4							Sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 4

Hydric Soil Present? Yes ______ No ✓

Remarks:

Hydric soil absent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 14

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

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

Subregion (LRR): C - Mediterranean California Lat: 36.923648 Long: -119.789873 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 8-15% slopes NWI classification: ______

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:

Sampling point taken within a seasonal wetland formed within a detention basin. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Hordeum marinum	20	Y	FAC
2. Eryngium castrense	10	Y	OBL
3. Erodium cicutarium	<1		N/L
4. Juncus bufonius	<1		FACW
5. Eleocharis macrostachya	<1		OBL
6. Acmispon americanus	<1		UPL
7. Bromus hordeaceous	5		FACU
8. Lythrum hyssopifolium	5		OBL
	40 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 14

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	90	5YR 4/6	10	C	M		Sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 6

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 15N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

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

Subregion (LRR): C - Mediterranean California Lat: 36.923685 Long: -119.789887 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 8-15% slopes NWI classification: ______

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 ✓	**Is the Sampled Area within a Wetland?** **Yes** ______ **No** ✓
Hydric Soil Present?	Yes ✓	No ______	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks:

Non-wetland adjacent to seasonal wetland sampling point 14. Sampling point is within a detention basin which lacks an OHWM. Detention basin does not appear to receive water regularly. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceous	25	Y	FACU
2. Hordeum marinum	5		FAC
3. Festuca bromoides	60	Y	FACU
4. Vicia villosa	<1		N/L
5.			
6.			
7.			
8.			
= Total Cover	90		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ______ **No** ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 15N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	90	7.5YR 5/6	10	C	M		Sandy loam

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 5

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 16

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 36.935562 Long: -119.788124 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 3-8% slopes NWI classification: ______

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:

Sampling point taken within a seasonal wetland swale. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Lasthenia fremontii	3		OBL
2. Plagiobothrys stipitatus	40	Y	FACW
3. Plagiobothrys greenei	40	Y	FACW
4. Deschampsia danthonioides	3		FACW
5. Lythrum hyssopifolium	2		OBL
6. Hordeum marinum	5		FAC
7. Mimulus guttatus	<1		OBL
8. Trifolium variegatum	<1		FAC
	93 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 7 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 16

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-2	10YR 3/2	100						Sandy clay loam
2-6	10YR 3/2	95	7.5YR 4/6	5	C	M, PL		Sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 6

Hydric Soil Present? Yes ✓ **No** ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 04/20/2017

Applicant/Owner: Madera County State: CA Sampling Point: 17N

Investigator(s): C. DeLong, E. Mecke, A. Miller Section, Township, Range: S33, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 36.935539 Long: -119.78809 Datum: NAD83

Soil Map Unit Name: Whitney and Rocklin sandy loams, 3-8% slopes NWI classification: ______

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:

Upland adjacent to seasonal wetland swale sampling point 16. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Festuca bromoides	75	Y	FACU
2. Avena fatua	1		N/L
3. Bromus hordeaceous	25	Y	FACU
4. Hypochaeris glabra	1		N/L
5. Erodium botrys	1		FACU
6. Bromus madritensis ssp. rubens	1		UPL
7. Sidalcea hirsuta	<1		OBL
8.			
= Total Cover	104		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 17N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	95	7.5YR 4/6	5	C	M, PL		Sandy clay loam

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 5

Hydric Soil Present? **Yes** ✓ **No** ______

Remarks:

Hydric soil present. Redox in pore linings only occurs along dead roots.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 08/09/2017

Applicant/Owner: Madera County State: CA Sampling Point: 21

Investigator(s): C. DeLong, E. Mecke Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 36.95211 Long: -119.774411 Datum: NAD83

Soil Map Unit Name: Redding-Raynor complex, 3-15% slopes NWI classification: ______

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:

Vernal pool. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 3' x 3')			
1. Glyceria declinata	10	Y	FACW
2. Pilularia americana	5	Y	OBL
3. Veronica peregrina	2		FAC
4. Eryngium castrense	2		OBL
5.			
6.			
7.			
8.			
= Total Cover	19		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 81 % Cover of Biotic Crust 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 21

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 Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 4/2	85	7.5YR 5/8	15	C	M, PL		Clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown

Depth (inches): 5

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 08/09/2017

Applicant/Owner: Madera County State: CA Sampling Point: 22N

Investigator(s): C. DeLong, E. Mecke Section, Township, Range: S27, T11S, R20E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): C - Mediterranean California Lat: 36.952092 Long: -119.774391 Datum: NAD83

Soil Map Unit Name: Redding-Raynor complex, 3-15% slopes NWI classification: ______

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:

Upland adjacent to vernal pool. Paired with sampling point 21. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 3' x 3')			
1. Bromus hordeaceus	40	Y	FACU
2. Hordeum marinum	40	Y	FAC
3. Festuca bromoides	10		FACU
4. Juncus bufonius	5		FACW
5.			
6.			
7.			
8.			
= Total Cover	95		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 22N

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-2	7.5YR 4/2	95	7.5YR 5/8	5	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 2

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 08/09/2017
Applicant/Owner: Madera County State: CA Sampling Point: 23
Investigator(s): C. DeLong, E. Mecke Section, Township, Range: S27, T11S, R20E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): C - Mediterranean California Lat: 36.952306 Long: -119.781571 Datum: NAD83
Soil Map Unit Name: Whitney and Rocklin sandy loams, 3-8% slopes NWI classification: ______
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:

Seasonal wetland swale within citrus orchard. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Croton setiger	10	Y	N/L
2. Veronica peregrina	20	Y	FAC
3. Mimulus guttatus	2		OBL
4. Polypogon monspeliensis	10	Y	FACW
5. Rumex crispus	5		FAC
6.			
7.			
8.			
= Total Cover	47		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 23

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks:

Hydrophytic vegetation present.

SOIL

Sampling Point: 23

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	95	7.5YR 5/8	5	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 6

Hydric Soil Present? Yes ✓ No ______

Remarks:

Hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rio Mesa Blvd. City/County: Madera County Sampling Date: 08/09/2017
Applicant/Owner: Madera County State: CA Sampling Point: 24N
Investigator(s): C. DeLong, E. Mecke Section, Township, Range: S27, T11S, R20E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR): C - Mediterranean California Lat: 36.952324 Long: -119.78159 Datum: NAD83
Soil Map Unit Name: Whitney and Rocklin sandy loams, 3-8% slopes NWI classification: ______
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 ✓	**Is the Sampled Area within a Wetland?** **Yes** ______ **No** ✓
Hydric Soil Present?	Yes ______	No ✓	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks:

Upland adjacent to seasonal wetland swale within citrus orchard. Paired with sampling point 23. Abnormally high rainfall this winter and spring.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: 5' x 5')			
1. Bromus hordeaceus	60	Y	FACU
2. Hordeum murinum	15		FACU
3. Lactuca serriola	5		FACU
4.			
5.			
6.			
7.			
8.			
= Total Cover	80		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ______ **No** ✓

Remarks:

Hydrophytic vegetation absent.

SOIL

Sampling Point: 24N

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/3	90	5YR 4/6	10	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Unknown
Depth (inches): 6

Hydric Soil Present? Yes ______ No ✓

Remarks:

Hydric soil indicators absent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ 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 Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ 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)
___ 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:

Wetland hydrology indicators absent.

ATTACHMENT C

Plant Species Observed Onsite

Rio Mesa Boulevard Project:
Plant Species Observed On-Site (18-20 April and 8-9 August 2017)

An Asterisk (*) indicates a non-native species.

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
ADOXACEAE	**MUSKROOT FAMILY**	
Sambucus nigra ssp. *caerulea*	Blue elderberry	FACU
AMARANTHACEAE	**AMARANTH FAMILY**	
*Amaranthus albus**	Pigweed amaranth	FACU
ANACARDIACEAE	**SUMAC FAMILY**	
*Pistacia chinensis**	Chinese pistache	N/L
APIACEAE	**CARROT FAMILY**	
*Anthriscus caucalis**	Bur chervil	N/L
Eryngium castrense	Button-celery	OBL
APOCYNACEAE	**DOGBANE FAMILY**	
Asclepias fascicularis	Narrow-leaf milkweed	FAC
ASTERACEAE	**SUNFLOWER FAMILY**	
Achyrachaena mollis	Blowwives	FAC
Ambrosia acanthicarpa	Annual burweed	N/L
*Centaurea solstitialis**	Yellow star-thistle	N/L
Centromadia pungens ssp. *pungens*	Common tarweed	FAC
*Cotula australis**	Australian brassbottons	FAC
Deinandra kelloggii	Kellogg's tarweed	N/L
Gnaphalium palustre	Western marsh cudweed	FACW
Helianthus annuus	Common sunflower	FACU
Heliotropium curassavicum	Seaside heliotrope	FACU
*Hypochaeris glabra**	Smooth cat's-ear	N/L
*Hypochaeris radicata**	Perennial cat's-ear	FACU
*Lactuca serriola**	Prickly lettuce	FACU
*Leontodon saxatilis**	Hairy hawkbit	FACU
*Logfia gallica**	Herba impia	N/L
*Matricaria discoidea**	Pineapple weed	FACU
Psilocarphus brevissimus	Dwarf woolly-heads	FACW
Psilocarphus chilensis	Round woolly marbles	FACW
Psilocarphus oregonus	Oregon woolly-heads	OBL
*Soliva sessilis**	Field burrweed	FACU
*Sonchus oleraceus**	Common sowthistle	UPL
Xanthium strumarium	Rough cockle-bur	FAC

Rio Mesa Boulevard Project:
Plant Species Observed On-Site (18-20 April and 8-9 August 2017)

An Asterisk (*) indicates a non-native species.

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
BORAGINACEAE	**BORAGE FAMILY**	
Amsinckia eastwoodiae	Eastwood's fiddleneck	N/L
Amsinckia menziesii	Rancher’s fireweed	N/L
Plagiobothrys canescens	Valley popcorn-flower	N/L
Plagiobothrys greenei	Greene's popcorn-flower	FACW
Plagiobothrys stipitatus	Slender popcorn-flower	FACW
BRASSICACEAE	**MUSTARD FAMILY**	
*Brassica nigra**	Black mustard	N/L
*Hirschfeldia incana**	Shortpod mustard	N/L
*Lepidium didymum**	Wart-cress	N/L
Lepidium nitidum	Pepper grass	FAC
*Raphanus raphanistrum**	Yellow wild radish	N/L
*Raphanus sativus**	Purple wild radish	N/L
*Sisymbrium officinale**	Hedge mustard	N/L
CAMPANULACEAE	**BELLFLOWER FAMILY**	
Downingia bicornuta	Double-horn downingia	OBL
Downingia ornatissima	Solano downingia	OBL
CARYOPHYLLACEAE	**PINK FAMILY**	
*Cerastium glomeratum**	Mouse-ear chickweed	UPL
*Silene gallica**	Catchfly	N/L
*Spergula arvensis**	Spurrey	N/L
*Spergularia rubra**	Purple sandspurry	FAC
CHENOPODIACEAE	**GOOSEFOOT FAMILY**	
*Chenopodium album**	White goosefoot	FACU
CRASSULACEAE	**STONECROP FAMILY**	
Crassula aquatica	Water pygmy-weed	OBL
*Crassula tillaea**	Mediterranean pygmy-weed	FACU
CYPERACEAE	**SEDGE FAMILY**	
Eleocharis acicularis var. *acicularis*	Least spikerush	OBL
Eleocharis macrostachya	Creeping spikerush	OBL
EUPHORBIACEAE	**SPURGE FAMILY**	
Croton setiger	Turkey mullein	N/L

Rio Mesa Boulevard Project:
Plant Species Observed On-Site (18-20 April and 8-9 August 2017)

An Asterisk (*) indicates a non-native species.

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
FABACEAE	**LEGUME FAMILY**	
Acmispon americanus	Spanish clover	UPL
Acmispon brachycarpus	Short-podded lotus	N/L
Lupinus microcarpus var. *densiflorus*	Chick lupine	N/L
*Medicago polymorpha**	Bur clover	FACU
Trifolium ciliolatum	Foothill clover	N/L
Trifolium depauperatum	Dwarf sack clover	FAC
*Trifolium hirtum**	Rose clover	N/L
Trifolium microcephalum	Small-head clover	FAC
*Trifolium subterraneum**	Subterranean clover	N/L
*Trifolium tomentosum**	Woolly clover	N/L
Trifolium variegatum	White-tip clover	FAC
Trifolium willdenovii	Tomcat clover	N/L
*Vicia villosa**	Winter vetch	N/L
GENTIANACEAE	**GENTIAN FAMILY**	
Cicendia quadrangularis	Gentian	FAC
GERANIACEAE	**GERANIUM FAMILY**	
*Erodium botrys**	Filaree	FACU
*Erodium cicutarium**	Filaree	N/L
*Erodium moschatum**	Filaree	N/L
JUNCACEAE	**RUSH FAMILY**	
Juncus bufonius	Toad rush	FACW
*Juncus capitatus**	Capped rush	FACU
Juncus uncialis	Inch-high rush	OBL
JUNCAGINACEAE	**ARROW-GRASS FAMILY**	
Triglochin scilloides	Flowering quillwort	OBL
LAMIACEAE	**MINT FAMILY**	
*Marrubium vulgare**	Common horehound	FACU
LYTHRACEAE	**LOOSESTRIFE FAMILY**	
*Lythrum hyssopifolia**	Hyssop loosestrife	OBL
MALVACEAE	**MALLOW FAMILY**	
Sidalcea hirsuta	Hairy checker-mallow	OBL

Rio Mesa Boulevard Project:
Plant Species Observed On-Site (18-20 April and 8-9 August 2017)

An Asterisk (*) indicates a non-native species.

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
MARSILEACEAE	**MARSILEA FAMILY**	
Pilularia americana	American pillwort	OBL
MONTIACEAE	**MINER'S LETTUCE FAMILY**	
Calandrinia ciliata	Red maids	FACU
ONAGRACEAE	**EVENING PRIMROSE FAMILY**	
Epilobium campestre	Smooth spike primrose	OBL
Epilobium cleistogamum	Cleistogamous spike primrose	OBL
OROBANCHACEAE	**BROOMRAPE FAMILY**	
Castilleja attenuata	Valley tassels	N/L
Castilleja campestris ssp. *succulenta*	Field owl's-clover	FACW
Castilleja exserta	Purple owl’s-clover	N/L
PHRYMACEAE	**LOPSEED FAMILY**	
Mimulus guttatus	Common large monkey-flower	OBL
Mimulus tricolor	Tri-color monkey-flower	OBL
PLANTAGINACEAE	**PLANTAIN FAMILY**	
Callitriche heterophylla	Larger water-starwort	OBL
Veronica peregrina ssp. *xalapensis*	Purslane speedwell	FAC
POACEAE	**GRASS FAMILY**	
*Aira caryophyllea**	Hairgrass	FACU
Alopecurus saccatus	Pacific foxtail	OBL
*Avena barbata**	Slender wild oat	N/L
*Avena fatua**	Wild oat	N/L
*Avena sativa**	Cultivated oat	UPL
*Bromus arenarius**	Australian brome	N/L
*Bromus diandrus**	Ripgut brome	N/L
*Bromus hordeaceus**	Soft brome	FACU
Bromus madritensis ssp. *rubens**	Red brome	UPL
*Cynodon dactylon**	Bermuda grass	FACU
Deschampsia danthonioides	Annual hairgrass	FACW
*Festuca bromoides**	Brome fescue	FACU
Festuca microstachys	Few flowered fescue	N/L
*Festuca myuros**	Rat-tail vulpia	N/L
*Festuca perennis**	Italian Ryegrass	FAC
*Glyceria declinata**	Mannagrass	FACW

Rio Mesa Boulevard Project:
Plant Species Observed On-Site (18-20 April and 8-9 August 2017)

An Asterisk (*) indicates a non-native species.

SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS
POACEAE	**GRASS FAMILY**	
Hordeum marinum ssp. *gussoneanum**	Mediterranean barley	FAC
*Hordeum murinum**	Barley	FACU
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	OBL
Phalaris lemmonii	Lemon's canary grass	FACW
*Poa annua**	Annual bluegrass	FAC
*Polypogon monspeliensis**	Annual rabbit-foot grass	FACW
POLYGONACEAE	**BUCKWHEAT FAMILY**	
Persicaria hydropiperoides	Swamp smartweed	OBL
Polygonum aviculare ssp. *depressum*	Prostrate knotweed	FAC
*Rumex crispus**	Curly dock	FAC
POTAMOGETONACEAE	**PICKEREL-WEED FAMILY**	
Potamogeton nodosus	Long-leaved pondweed	OBL
RANUNCULACEAE	**BUTTERCUP FAMILY**	
Myosurus minimus	Tiny mouse-tail	OBL
Ranunculus aquatilis	White water buttercup	OBL
RUTACEAE	**RUE FAMILY**	
*Citrus sinensis**	Orange	N/L
SOLANACEAE	**NIGHTSHADE FAMILY**	
Datura wrightii	Sacred thornapple	UPL
THEMIDACEAE	**BRODIAEA FAMILY**	
Triteleia hyacinthina	Hyacinth brodiaea	FAC
URTICACEAE	**NETTLE FAMILY**	
Urtica dioica	Stinging nettle	FAC

ATTACHMENT D

Representative Site Photographs

Photo 1. Vernal Pool VP-01 near sampling point 02, facing east (April 18, 2017).

Photo 2. Upland at sampling point 07N, facing southwest (April 18, 2017).

Photo 3. Vernal Pool VP-07 facing south (April 19, 2017).

Photo 4. Disked farmland in central portion of Study Area (April 19, 2017).

Photo 5. Seasonal wetland SW-30 facing north (April 20, 2017).

Photo 6. Seasonal wetland SW-33 facing west (April 20, 2017).

Photo 7. Seasonal wetland swale SWS-11 facing east (April 20, 2017).

Photo 8. Vernal Pool VP-63 near sampling point 21, facing east (August 8, 2017).

ATTACHMENT E

USACE ORM Aquatic Resources Table

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
D-2	CALIFORNIA	PEM	RIVERINE	Area	0.023	ACRE	DELINEATE	36.95224037	-119.7820194
D-3	CALIFORNIA	PEM	RIVERINE	Area	0.006	ACRE	DELINEATE	36.95224261	-119.7815112
DB-01	CALIFORNIA	PEM	DEPRESS	Area	0.142	ACRE	DELINEATE	36.92338783	-119.7852814
DB-02	CALIFORNIA	PEM	DEPRESS	Area	0.240	ACRE	DELINEATE	36.92340319	-119.7844715
DB-05	CALIFORNIA	PEM	DEPRESS	Area	0.039	ACRE	DELINEATE	36.92351226	-119.789796
SW-03	CALIFORNIA	PEM	DEPRESS	Area	0.014	ACRE	DELINEATE	36.94701868	-119.7689537
SW-04	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.9503066	-119.7775139
SW-05	CALIFORNIA	PEM	DEPRESS	Area	0.015	ACRE	DELINEATE	36.9442564	-119.7780001
SW-06	CALIFORNIA	PEM	DEPRESS	Area	0.003	ACRE	DELINEATE	36.95038385	-119.7782748
SW-07	CALIFORNIA	PEM	DEPRESS	Area	0.013	ACRE	DELINEATE	36.94993898	-119.7785365
SW-08	CALIFORNIA	PEM	DEPRESS	Area	0.008	ACRE	DELINEATE	36.95006549	-119.7789616
SW-09	CALIFORNIA	PEM	DEPRESS	Area	0.012	ACRE	DELINEATE	36.94548372	-119.7816258
SW-10	CALIFORNIA	PEM	DEPRESS	Area	0.012	ACRE	DELINEATE	36.94518299	-119.7818914
SW-100	CALIFORNIA	PEM	DEPRESS	Area	0.007	ACRE	DELINEATE	36.95215457	-119.7810932
SW-101	CALIFORNIA	PEM	DEPRESS	Area	0.007	ACRE	DELINEATE	36.95218047	-119.780877
SW-102	CALIFORNIA	PEM	DEPRESS	Area	0.020	ACRE	DELINEATE	36.95145361	-119.7811321
SW-103	CALIFORNIA	PEM	DEPRESS	Area	0.004	ACRE	DELINEATE	36.95147141	-119.7812451
SW-11	CALIFORNIA	PEM	DEPRESS	Area	0.006	ACRE	DELINEATE	36.94489191	-119.7820738
SW-113	CALIFORNIA	PEM	DEPRESS	Area	0.004	ACRE	DELINEATE	36.9524227	-119.7768032
SW-114	CALIFORNIA	PEM	DEPRESS	Area	0.002	ACRE	DELINEATE	36.95240581	-119.7764548
SW-115	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.95217483	-119.7755945
SW-116	CALIFORNIA	PEM	DEPRESS	Area	0.019	ACRE	DELINEATE	36.95189677	-119.7750001
SW-117	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.95214751	-119.7750485
SW-118	CALIFORNIA	PEM	DEPRESS	Area	0.026	ACRE	DELINEATE	36.95220998	-119.7734598
SW-12	CALIFORNIA	PEM	DEPRESS	Area	0.023	ACRE	DELINEATE	36.94435042	-119.7823036
SW-120	CALIFORNIA	PEM	DEPRESS	Area	0.054	ACRE	DELINEATE	36.92254116	-119.7890652
SW-13	CALIFORNIA	PEM	DEPRESS	Area	0.008	ACRE	DELINEATE	36.94469993	-119.7824034
SW-14	CALIFORNIA	PEM	DEPRESS	Area	0.034	ACRE	DELINEATE	36.94487695	-119.7824667
SW-15	CALIFORNIA	PEM	DEPRESS	Area	0.006	ACRE	DELINEATE	36.94375931	-119.7826289
SW-16	CALIFORNIA	PEM	DEPRESS	Area	0.018	ACRE	DELINEATE	36.94411737	-119.7832243
SW-17	CALIFORNIA	PEM	DEPRESS	Area	0.011	ACRE	DELINEATE	36.94471256	-119.7841985
SW-18	CALIFORNIA	PEM	DEPRESS	Area	0.013	ACRE	DELINEATE	36.94495539	-119.7842226
SW-19	CALIFORNIA	PEM	DEPRESS	Area	0.002	ACRE	DELINEATE	36.94347324	-119.784393
SW-20	CALIFORNIA	PEM	DEPRESS	Area	0.004	ACRE	DELINEATE	36.94325556	-119.7847077
SW-21	CALIFORNIA	PEM	DEPRESS	Area	0.024	ACRE	DELINEATE	36.9440805	-119.7855105
SW-22	CALIFORNIA	PEM	DEPRESS	Area	0.015	ACRE	DELINEATE	36.94366797	-119.7855628
SW-23	CALIFORNIA	PEM	DEPRESS	Area	0.008	ACRE	DELINEATE	36.94477884	-119.7855828
SW-24	CALIFORNIA	PEM	DEPRESS	Area	0.002	ACRE	DELINEATE	36.94410218	-119.786559
SW-25	CALIFORNIA	PEM	DEPRESS	Area	0.010	ACRE	DELINEATE	36.94329892	-119.7868137
SW-26	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.94356921	-119.7868398
SW-27	CALIFORNIA	PEM	DEPRESS	Area	0.035	ACRE	DELINEATE	36.93511771	-119.7879863
SW-28	CALIFORNIA	PEM	DEPRESS	Area	0.024	ACRE	DELINEATE	36.93537459	-119.7882105
SW-29	CALIFORNIA	PEM	DEPRESS	Area	0.026	ACRE	DELINEATE	36.93496853	-119.7884841
SW-38	CALIFORNIA	PEM	DEPRESS	Area	0.017	ACRE	DELINEATE	36.94378413	-119.7809875
SW-72	CALIFORNIA	PEM	DEPRESS	Area	0.037	ACRE	DELINEATE	36.95148918	-119.7809677
SW-75	CALIFORNIA	PEM	DEPRESS	Area	0.040	ACRE	DELINEATE	36.95142576	-119.7766915
SW-76	CALIFORNIA	PEM	DEPRESS	Area	0.009	ACRE	DELINEATE	36.95119046	-119.7768924
SW-78	CALIFORNIA	PEM	DEPRESS	Area	0.011	ACRE	DELINEATE	36.95157244	-119.7763667
SW-79	CALIFORNIA	PEM	DEPRESS	Area	0.002	ACRE	DELINEATE	36.95149075	-119.7760033
SW-80	CALIFORNIA	PEM	DEPRESS	Area	0.004	ACRE	DELINEATE	36.95149847	-119.7751605
SW-81	CALIFORNIA	PEM	DEPRESS	Area	0.002	ACRE	DELINEATE	36.95165294	-119.7750744
SW-82	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.95161997	-119.775016
SW-97	CALIFORNIA	PEM	DEPRESS	Area	0.015	ACRE	DELINEATE	36.95142704	-119.7847469
SW-98	CALIFORNIA	PEM	DEPRESS	Area	0.023	ACRE	DELINEATE	36.95197646	-119.7827472
SW-99	CALIFORNIA	PEM	DEPRESS	Area	0.001	ACRE	DELINEATE	36.95211219	-119.7817235
SWS-02	CALIFORNIA	PEM	SLOPE	Area	0.155	ACRE	DELINEATE	36.94643247	-119.7709013
SWS-03	CALIFORNIA	PEM	SLOPE	Area	0.169	ACRE	DELINEATE	36.95187053	-119.7770635
SWS-04	CALIFORNIA	PEM	SLOPE	Area	0.022	ACRE	DELINEATE	36.95042137	-119.777799
SWS-05	CALIFORNIA	PEM	SLOPE	Area	0.073	ACRE	DELINEATE	36.95097726	-119.7779029
SWS-06	CALIFORNIA	PEM	SLOPE	Area	0.023	ACRE	DELINEATE	36.95025494	-119.7786249
SWS-07	CALIFORNIA	PEM	SLOPE	Area	0.072	ACRE	DELINEATE	36.9496625	-119.7788105
SWS-08	CALIFORNIA	PEM	SLOPE	Area	0.013	ACRE	DELINEATE	36.94996687	-119.7791827
SWS-09	CALIFORNIA	PEM	SLOPE	Area	0.092	ACRE	DELINEATE	36.94382693	-119.7836086
SWS-10	CALIFORNIA	PEM	SLOPE	Area	0.888	ACRE	DELINEATE	36.93610616	-119.7869177
SWS-13	CALIFORNIA	PEM	SLOPE	Area	0.002	ACRE	DELINEATE	36.95234374	-119.7768276
SWS-20	CALIFORNIA	PEM	SLOPE	Area	0.596	ACRE	DELINEATE	36.95180017	-119.782729
SWS-49	CALIFORNIA	PEM	SLOPE	Area	0.031	ACRE	DELINEATE	36.95178361	-119.7807717
SWS-52	CALIFORNIA	PEM	SLOPE	Area	0.006	ACRE	DELINEATE	36.95151092	-119.7748929
SWS-59	CALIFORNIA	PEM	SLOPE	Area	0.064	ACRE	DELINEATE	36.9519762	-119.7756846
SWS-60	CALIFORNIA	PEM	SLOPE	Area	0.017	ACRE	DELINEATE	36.95150418	-119.7765496
SWS-61	CALIFORNIA	PEM	SLOPE	Area	0.225	ACRE	DELINEATE	36.95239213	-119.7811475
SWS-62	CALIFORNIA	PEM	SLOPE	Area	0.051	ACRE	DELINEATE	36.93696838	-119.7855046
SWS-63	CALIFORNIA	PEM	SLOPE	Area	0.269	ACRE	DELINEATE	36.92276848	-119.7877371
SWS-64	CALIFORNIA	PEM	SLOPE	Area	0.193	ACRE	DELINEATE	36.92292037	-119.7861102
VP-01	CALIFORNIA	PEM	DEPRESS	Area	0.050	ACRE	DELINEATE	36.94818189	-119.7679694
VP-02	CALIFORNIA	PEM	DEPRESS	Area	0.005	ACRE	DELINEATE	36.94771014	-119.7680939
VP-04	CALIFORNIA	PEM	DEPRESS	Area	0.065	ACRE	DELINEATE	36.9508519	-119.7774883
VP-05	CALIFORNIA	PEM	DEPRESS	Area	0.026	ACRE	DELINEATE	36.95145104	-119.7774984
VP-06	CALIFORNIA	PEM	DEPRESS	Area	0.025	ACRE	DELINEATE	36.94974385	-119.7783579
VP-07	CALIFORNIA	PEM	DEPRESS	Area	0.817	ACRE	DELINEATE	36.94390675	-119.7818271
VP-08	CALIFORNIA	PEM	DEPRESS	Area	0.062	ACRE	DELINEATE	36.94485047	-119.7818271
VP-09	CALIFORNIA	PEM	DEPRESS	Area	0.031	ACRE	DELINEATE	36.94539131	-119.7820506
VP-10	CALIFORNIA	PEM	DEPRESS	Area	0.033	ACRE	DELINEATE	36.9435259	-119.7833987
VP-100	CALIFORNIA	PEM	DEPRESS	Area	0.049	ACRE	DELINEATE	36.95213744	-119.7760097
VP-101	CALIFORNIA	PEM	DEPRESS	Area	0.009	ACRE	DELINEATE	36.95216861	-119.77576
VP-102	CALIFORNIA	PEM	DEPRESS	Area	0.025	ACRE	DELINEATE	36.95192647	-119.7751814
VP-103	CALIFORNIA	PEM	DEPRESS	Area	0.067	ACRE	DELINEATE	36.95216604	-119.7744803
VP-104	CALIFORNIA	PEM	DEPRESS	Area	0.025	ACRE	DELINEATE	36.95218365	-119.7742666
VP-107	CALIFORNIA	PEM	DEPRESS	Area	0.188	ACRE	DELINEATE	36.92307628	-119.7845837
VP-11	CALIFORNIA	PEM	DEPRESS	Area	0.187	ACRE	DELINEATE	36.94430396	-119.7838541
VP-12	CALIFORNIA	PEM	DEPRESS	Area	0.104	ACRE	DELINEATE	36.94346541	-119.7841562
VP-13a	CALIFORNIA	PEM	DEPRESS	Area	0.074	ACRE	DELINEATE	36.94492916	-119.7847154
VP-13b	CALIFORNIA	PEM	DEPRESS	Area	0.674	ACRE	DELINEATE	36.94451026	-119.7843906

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude
VP-14	CALIFORNIA	PEM	DEPRESS	Area	0.019	ACRE	DELINEATE	36.94363501	-119.7845014
VP-15	CALIFORNIA	PEM	DEPRESS	Area	0.079	ACRE	DELINEATE	36.94356772	-119.7847111
VP-16	CALIFORNIA	PEM	DEPRESS	Area	0.063	ACRE	DELINEATE	36.94483133	-119.7852698
VP-17	CALIFORNIA	PEM	DEPRESS	Area	0.090	ACRE	DELINEATE	36.94329096	-119.7864466
VP-18	CALIFORNIA	PEM	DEPRESS	Area	0.011	ACRE	DELINEATE	36.94354516	-119.7866777
VP-19	CALIFORNIA	PEM	DEPRESS	Area	0.082	ACRE	DELINEATE	36.93638052	-119.7868982
VP-20	CALIFORNIA	PEM	DEPRESS	Area	0.087	ACRE	DELINEATE	36.94347873	-119.787021
VP-21	CALIFORNIA	PEM	DEPRESS	Area	0.101	ACRE	DELINEATE	36.94325171	-119.7871187
VP-22	CALIFORNIA	PEM	DEPRESS	Area	0.037	ACRE	DELINEATE	36.93484922	-119.7880708
VP-23	CALIFORNIA	PEM	DEPRESS	Area	0.016	ACRE	DELINEATE	36.93421229	-119.7894431
VP-65	CALIFORNIA	PEM	DEPRESS	Area	0.019	ACRE	DELINEATE	36.95209454	-119.7808999
VP-72	CALIFORNIA	PEM	DEPRESS	Area	0.040	ACRE	DELINEATE	36.95169943	-119.7766617
VP-73	CALIFORNIA	PEM	DEPRESS	Area	0.019	ACRE	DELINEATE	36.95164861	-119.7753541
VP-97	CALIFORNIA	PEM	DEPRESS	Area	0.130	ACRE	DELINEATE	36.9519388	-119.7766415
VP-98	CALIFORNIA	PEM	DEPRESS	Area	0.135	ACRE	DELINEATE	36.95205403	-119.7764261
VP-99	CALIFORNIA	PEM	DEPRESS	Area	0.022	ACRE	DELINEATE	36.95216138	-119.7762714

ATTACHMENT F

Wetland Delineation Shape File
(to be included with USACE submittal only)

APPENDIX G

Noise Modeling Output

G1: Roadway Construction Noise Model Output

G2: Traffic Noise Levels and Noise Contours

G1: Roadway Construction Noise Model Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2020
Case Description: Clearing Phase 1 Avenue 14

Description	**Affected Land Use**
Clearing Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.9**

*Calculated Lmax is the Loudest value.

Report date: 8/24/2020
Case Description: Grade Preparation Phase 1 Avenu 14

Description	**Affected Land Use**
Grade Preparation Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Compactor (ground)	No	20		83.2	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Rough Excavation Avenue 14

Description	**Affected Land Use**
Phase 1 Rough Excavation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Scraper	No	40		83.6	500	0
Scraper	No	40		83.6	500	0
Compactor (ground)	No	20		83.2	500	0
Tractor	No	40	84		500	0
Grader	No	40	85		500	0
Water Truck	No	20		92.1	500	0
Water Truck	No	20		92.1	500	0

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Scraper		63.6	59.6
Compactor (ground)		63.2	56.2
Tractor		64	60
Grader		65	61
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**70.4**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Avenue 14- Sewer, Drain, Recycled Water, Water System and Aggregate Base

Description	**Affected Land Use**
Phase 1 Sewer, Drain, Recycled Water, Water Syste	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Excavator	No	40		80.7	500
Excavator	No	40		80.7	500
Front End Loader	No	40		79.1	500
Tractor	No	40	84		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Grader	No	40	85		500
Scraper	No	40		83.6	500
Roller	No	20		80	500

	Calculated (dBA)	
Equipment	***Lmax**	**Leq**
Excavator	60.7	56.7
Excavator	60.7	56.7
Front End Loader	59.1	55.1
Tractor	64	60
Tractor	64	60
Water Truck	72.1	65.1
Grader	65	61
Scraper	63.6	59.6
Roller	60	53
Total	**72.1**	**69.5**

*Calculated Lmax is the Loudest value.

Report date: 8/24/2020
Case Description: **Grade Preparation Phase 1 Rio Mesa Boulevard**

Description	**Affected Land Use**
Grade Preparation Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Compactor (ground)	No	20		83.2	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2020
Case Description: Clearing Phase 1 Rio Mesa Boulevard

Description	**Affected Land Use**
Clearing Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Rough Exavation Rio Mesa Blvd.

Description	**Affected Land Use**
Phase 1 Rough Exavation Rio Mesa Blvd.	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Scraper	No	40		83.6	500	0
Scraper	No	40		83.6	500	0
Scraper	No	40		83.6	500	0
Compactor (ground)	No	20		83.2	500	0
Grader	No	40	85		500	0
Tractor	No	40	84		500	0
Water Jet deleading	No	20		92.1	500	0
Water Jet deleading	No	20		92.1	500	0
Water Jet deleading	No	20		92.1	500	0
Water Jet deleading	No	20		92.1	500	0

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Scraper		63.6	59.6
Scraper		63.6	59.6
Compactor (ground)		63.2	56.2
Grader		65	61
Tractor		64	60
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
	Total	**72.1**	**72.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Drain System, Bridge, Sewer, Recycled Water, Water, Dry Utilities, Street Light, Lime Treated , Aggregate Base and Curbs Rio Mesa Boulevard

Description	**Affected Land Use**
Phase 1 Drain System, Bridge, Sewer, Recycled Water, Water, Dry Utilities, Street Light, Lime Treated , Aggregate Base and Curbs	Residential

			Equipment		
			Spec	**Actual**	**Receptor**
	Impact		**Lmax**	**Lmax**	**Distance**
Description	**Device**	**Usage(%)**	**(dBA)**	**(dBA)**	**(feet)**
Excavator	No	40		80.7	500
Excavator	No	40		80.7	500
Front End Loader	No	40		79.1	500
Excavator	No	40		80.7	500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Gradall	No	40		83.4	500
Backhoe	No	40		77.6	500
Grader	No	40	85		500
Scraper	No	40		83.6	500
Mixer Truck	No	40		78.8	500
Paver	No	50		77.2	500

		Calculated (dBA)	
Equipment		***Lmax**	**Leq**
Excavator		60.7	56.7
Excavator		60.7	56.7
Front End Loader		59.1	55.1
Excavator		60.7	56.7
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
Water Truck		72.1	65.1
Gradall		63.4	59.4
Backhoe		57.6	53.6
Grader		65	61
Scraper		63.6	59.6
Mixer Truck		58.8	54.8
Paver		57.2	54.2
	Total	**72.1**	**72.1**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Asphalt Paving, Striping and Sinage Rio Mesa Boulevard

Description	**Land Use**
Phase 1 Asphalt Paving, Striping and Sinage	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	500
Roller	No	20		80	500
Roller	No	20		80	500
Roller	No	20		80	500
Tractor	No	40	84		500
Tractor	No	40	84		500
Tractor	No	40	84		500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		57.2	54.2
Roller		60	53
Roller		60	53
Roller		60	53
Tractor		64	60
Tractor		64	60
Tractor		64	60
	Total	**64**	**65.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2020
Case Description: Clearing Phase 1 Utility Corridor

Description	**Affected Land Use**
Clearing Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.9**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 1 Grade Preparation Utility Corridor

Description	Affected Land Use
Phase 1 Grade Preparation North South Utility Corridor	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Water Jet deleading	No	20		92.1	500
Tractor	No	40	84		500
Water Jet deleading	No	20		92.1	500
Compactor (ground)	No	20		83.2	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Water Jet deleading		72.1	65.1
Tractor		64	60
Water Jet deleading		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Pahse 1 Rough Excavation North South Utility Corridor

Description	**Land Use**
Pahse 1 Rough Excavation North South Utility Corridor	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Scraper	No	40		83.6	500
Compactor (ground)	No	20		83.2	500
Grader	No	40	85		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Scraper		63.6	59.6
Compactor (ground)		63.2	56.2
Grader		65	61
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**70.4**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 1 Sewer, Drain, Recycled Water, Water System and Aggergate Base North South Utility Corridor

Description	**Land Use**
Phase 1 Sewer, Drain, Recycled Water, Water System and Aggergate Base	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Excavator	No	40		80.7	500
Excavator	No	40		80.7	500
Front End Loader	No	40		79.1	500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Gradall	No	40		83.4	500
Man Lift	No	20		74.7	500
Concrete Mixer Truck	No	40		78.8	500
Grader	No	40	85		500
Scraper	No	40		83.6	500
Roller	No	20		80	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Excavator		60.7	56.7
Excavator		60.7	56.7
Front End Loader		59.1	55.1
Tractor		64	60
Water Truck		72.1	65.1
Gradall		63.4	59.4
Man Lift		54.7	47.7
Concrete Mixer Truck		58.8	54.8
Grader		65	61
Scraper		63.6	59.6
Roller		60	53
	Total	**72.1**	**69.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/24/2020
Case Description: Clearing Phase 1 Avenue 12

Description	**Affected Land Use**
Clearing Phase 1	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Tractor		64	60
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Grade Preparation Avenue 12

Description	**Affected Land Use**
Phase 1 Grade Preparation Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		500
WaterTruck	No	20		92.1	500
WaterTruck	No	20		92.1	500
Compactor (ground)	No	20		83.2	500

		Calculated (dBA)	
Equipment		***Lmax**	**Leq**
Tractor		64	60
WaterTruck		72.1	65.1
WaterTruck		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 1 Rough Excavation Avenue 12

Description	**Land Use**
Phase 1 Rough Excavation Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Compactor (ground)	No	20		83.2	500
Scraper	No	40		83.6	500
Grader	No	40	85		500
Tractor	No	40	84		500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Compactor (ground)		63.2	56.2
Scraper		63.6	59.6
Grader		65	61
Tractor		64	60
	Total	**65**	**66.5**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 1 Drain System, Light System, Lime Treated and Aggregate Base Avenue 12

Description	**Land Use**
Phase 1 Drain System, Light System, Lime Treated and Aggrega	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Gradall	No	40		83.4	500
Man Lift	No	20		74.7	500
Concrete Mixer Truck	No	40		78.8	500
Excavator	No	40		80.7	500
Front End Loader	No	40		79.1	500
Backhoe	No	40		77.6	500
Tractor	No	40	84		500
Grader	No	40	85		500
Scraper	No	40		83.6	500
Roller	No	20		80	500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Gradall		63.4	59.4
Man Lift		54.7	47.7
Concrete Mixer Truck		58.8	54.8
Excavator		60.7	56.7
Front End Loader		59.1	55.1
Backhoe		57.6	53.6
Tractor		64	60
Grader		65	61
Scraper		63.6	59.6
Roller		60	53
Water Truck		72.1	65.1
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**71.9**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 1 Paving, sinage and striping Avenue 12

Description	**Land Use**
Phase 1 Paving, sinage and striping Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	500
Roller	No	20		80	500
Roller	No	20		80	500
Roller	No	20		80	500
Tractor	No	40	84		500
Tractor	No	40	84		500
Tractor	No	40	84		500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		57.2	54.2
Roller		60	53
Roller		60	53
Roller		60	53
Tractor		64	60
Tractor		64	60
Tractor		64	60
	Total	**64**	**65.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Cleraing Rio Mesa

Description	**Affected Land Use**
Phase 2 Cleraing Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Scraper	No	40		83.6	500	0
Grader	No	40	85		500	0
Water Jet deleading	No	20		92.1	500	0
Water Jet deleading	No	20		92.1	500	0

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
	Total	**72.1**	**69.4**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 2 Grade Preparation Rio Mesa

Description	**Land Use**
Phase 2 Grade Preparation Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		500	0
Water Jet deleading	No	20		92.1	500	0
Water Jet deleading	No	20		92.1	500	0
Compactor (ground)	No	20		83.2	500	0

		Calculated (dBA)	
Equipment		***Lmax**	**Leq**
Grader		65	61
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69.1**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Rough Excavation Rio Mesa

Description	**Affected Land Use**
Phase 2 Rough Excavation Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Scraper	No	40		83.6	500	0
Grader	No	40	85		500	0
Compactor (ground)	No	20		83.2	500	0
Water Truck	No	20		92.1	500	0
Water Truck	No	20		92.1	500	0

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Compactor (ground)		63.2	56.2
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020

Case Description: Phase 2 Drain System, Dry Utilites, Lime Treated and Aggregate Base

Description	**Affected Land Use**
Phase 2 Drain System, Dry Utilites, Lime Treated and Aggrega	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Excavator	No	40		80.7	500
Front End Loader	No	40		79.1	500
Water Jet deleading	No	20		92.1	500
Water Jet deleading	No	20		92.1	500
Grader	No	40	85		500
Scraper	No	40		83.6	500
Roller	No	20		80	500
Roller	No	20		80	500
Concrete Mixer Truck	No	40		78.8	500
Compactor (ground)	No	20		83.2	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Excavator		60.7	56.7
Front End Loader		59.1	55.1
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
Grader		65	61
Scraper		63.6	59.6
Roller		60	53
Roller		60	53
Concrete Mixer Truck		58.8	54.8
Compactor (ground)		63.2	56.2
	Total	**72.1**	**70.2**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 1 Asphalt Paving, Curbs and Gutters Rio Mesa

Description	**Affected Land Use**
Phase 1 Asphalt Paving, Curbs and Gutters Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	500
Roller	No	20		80	500
Roller	No	20		80	500
Roller	No	20		80	500
Pavement Scarafier	No	20		89.5	500
Tractor	No	40	84		500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Paver		57.2	54.2
Roller		60	53
Roller		60	53
Roller		60	53
Pavement Scarafier		69.5	62.5
Tractor		64	60
	Total	**69.5**	**65.6**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 2 Striping, Sinage and Landscape Rio Mesa

Description	**Land Use**
Phase 2 Striping, Sinage and Landscape Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		500
Tractor	No	40	84		500
Backhoe	No	40		77.6	500
Tractor	No	40	84		500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Tractor		64	60
Tractor		64	60
Backhoe		57.6	53.6
Tractor		64	60
	Total	**64**	**65.1**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Cleraing Avenue 12

Description	**Affected Land Use**
Phase 2 Cleraing Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.4**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Grade Preparation Avenue 12

Description	**Affected Land Use**
Phase 2 Grade Preparation Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Grader	No	40	85		500
Water Jet deleading	No	20		92.1	500
Water Jet deleading	No	20		92.1	500
Compactor (ground)	No	20		83.2	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		65	61
Water Jet deleading		72.1	65.1
Water Jet deleading		72.1	65.1
Compactor (ground)		63.2	56.2
	Total	**72.1**	**69.1**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 2 Rough Excavation Rio Mesa

Description	**Affected Land Use**
Phase 2 Rough Excavation Rio Mesa	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Scraper	No	40		83.6	500
Grader	No	40	85		500
Compactor (ground)	No	20		83.2	500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Scraper		63.6	59.6
Grader		65	61
Compactor (ground)		63.2	56.2
Water Truck		72.1	65.1
Water Truck		72.1	65.1
	Total	**72.1**	**69.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Dry Utilities, Signal, Lime Treated, Concrete and Aggregated Base Avenue 12

Description	**Affected Land Use**
Phase 2 Dry Utilities, Signal, Lime Treated, Concrete and Ag	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Excavator	No	40		80.7	500
Tractor	No	40	84		500
Tractor	No	40	84		500
Water Truck	No	20		92.1	500
Water Truck	No	20		92.1	500
Grader	No	40	85		500
Roller	No	20		80	500
Scraper	No	40		83.6	500
Roller	No	20		80	500
Concrete Mixer Truck	No	40		78.8	500
Compactor (ground)	No	20		83.2	500
Compactor (ground)	No	20		83.2	500

	Calculated (dBA)	
Equipment	***Lmax**	**Leq**
Excavator	60.7	56.7
Tractor	64	60
Tractor	64	60
Water Truck	72.1	65.1
Water Truck	72.1	65.1
Grader	65	61
Roller	60	53
Scraper	63.6	59.6
Roller	60	53
Concrete Mixer Truck	58.8	54.8
Compactor (ground)	63.2	56.2
Compactor (ground)	63.2	56.2
Total	**72.1**	**71**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/1/2020
Case Description: Phase 2 Paving Avenue 12

Description	**Land Use**
Phase 2 Paving Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Paver	No	50		77.2	500
Roller	No	20		80	500
Roller	No	20		80	500

Calculated (dBA)

Equipment		***Lmax**	**L10**
Paver		57.2	57.2
Roller		60	56
Roller		60	56
	Total	**60**	**61.2**

*Calculated Lmax is the Loudest value.

Report date: 9/1/2020
Case Description: Phase 2 Striping, Sinage and Landscape Avenue 12

Description	Land Use
Phase 2 Striping, Sinage and Landscape Avenue 12	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		500
Tractor	No	40	84		500
Tractor	No	40	84		500
Backhoe	No	40		77.6	500

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Tractor		64	60
Tractor		64	60
Tractor		64	60
Backhoe		57.6	53.6
	Total	**64**	**65.1**

*Calculated Lmax is the Loudest value.

G2: Traffic Noise Levels and Noise Contours

Rio Mesa Boulevard - Existing Traffic Noise at 100 Feet from State Route 41

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2017-089
Project Name: Rio Mesa Boulevard

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Caltrans 2019
Community Noise Descriptor: L_{dn}: x CNEL: ______

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

														Traffic Volumes		
				Design		Vehicle Mix		Distance from Centerline of Roadway								
Analysis Condition		Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour				Calc	Day	Eve	Night
Roadway, Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn	Dist			
Existing																
SR 41	2	0	20,200	45	0.5	1.8%	0.7%	**63.7**	38	81	175	377	100	15,695	2,565	1,939

Rio Mesa Boulevard - Existing Traffic Noise at 1,400 Feet from State Route 41

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2017-089
Project Name: Rio Mesa Boulevard

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	Caltrans 2019
Community Noise Descriptor:	L_{dn}: x CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

						Vehicle Mix		Distance from Centerline of Roadway						Traffic Volumes		
									Distance to Contour							
Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Medium Trucks	Heavy Trucks	Ldn at 1,400 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn	Calc Dist	Day	Eve	Night
Existing																
SR 41	2	0	20,200	45	0.5	1.8%	0.7%	**46.4**	38	81	175	377	1,400	15,695	2,565	1,939

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2017-089
Project Name: Rio Mesa Boulevard

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	KD Anderson 2020
Community Noise Descriptor:	L_{dn}: x CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

						Vehicle Mix		Distance from Centerline of Roadway						Traffic Volumes		
Analysis Condition				Design					Distance to Contour							
Roadway, Segment	Lanes	Median Width	ADT Volume	Speed (mph)	Alpha Factor	Medium Trucks	Heavy Trucks	Ldn at 500 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn	Calc Dist	Day	Eve	Night
Project Buildout																
Rio Mesa Boulevard	4	0	16,000	65	0.5	1.8%	0.7%	**56.1**	59	128	275	593	500	12,432	2,032	1,536

APPENDIX H

Transportation Analysis
(KD Anderson & Associates, Inc 2020)

TRAFFIC IMPACT ANALYSIS

FOR THE

RIO MESA BLVD PROJECT
Madera County, CA

Prepared For:

ECORP CONSULTING, INC.
2525 Warren Drive
Rocklin, CA 95677

Prepared By:

KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, California 95650
(916) 660-1555

November 9, 2020

2610-25

Rio Mesa Blvd 11 2020.rpt

TRAFFIC IMPACT ANALYSIS FOR
THE RIO MESA BLVD PROJECT

TABLE OF CONTENTS

TRAFFIC OPERATIONS IMPACT ANALYSIS
RIO MESA BLVD PHASE 1 PROJECT

INTRODUCTION

Project Description

Rio Mesa Blvd is part of the circulation system for the development approved by Madera County for the portion of the Rio Mesa Area Plan (RMAP) generally north of the San Joaquin River and east of State Route 41. The alignment of the road has been selected and adopted by Madera County as an Official Plan Line. In conjunction with other planned improvements to SR 41 and new roads to be constructed as development proceeds, Rio Mesa Blvd will form an important north-south route parallel to the state highway.

The Rio Mesa Blvd Phase 1 project involves the construction of a two-lane facility from the planned extension of Tesoro Viejo Road east of the SR 41 / Avenue 15 intersection southerly to an intersection on Avenue 12. The construction of Rio Mesa Blvd Phase 1 is expected to be completed in 2022, and at that time other portions of the adjoining Tesoro Viejo community circulation system will be in place.

Analysis Purpose and Objectives

The purpose of this traffic operations study is to present an evaluation of the traffic conditions associated with the first phase of the Rio Mesa Blvd project. The proposed project lies east of and generally parallel to State Route 41 between Avenue 15 and Avenue 12 in the Rio Mesa area of southeastern Madera County. The Phase 1 project involves construction of a two-lane roadway, while Phase 2 will widen the road to four lanes.

This study presents an evaluation of the impacts of the proposed project on both near-term and long-term background traffic conditions. The following scenarios have been evaluated:

- Current Year 2019 conditions
- Opening Day 2022 Plus Rio Mesa Blvd Phase 1 Project
- Future Year 2042 Cumulative Conditions with Rio Mesa Blvd Phase 2

The objective of this study is to identify those roads and intersections that would operate under conditions that are consistent with the goals and policies of the Madera County General Plan. With the implementation of SB 743, operational Level of Service is no longer a significance criteria under the California Environmental Quality Act (CEQA). Thus, this analysis considers whether the project would result in effects that are appreciably inconsistent with the General Plan and whether improvements are needed to achieve General Plan consistency.

Existing Setting

Circulation System. Major Roadways in the study area are described below:

- **State Route 41** is the primary regional roadway in eastern Madera County and extends from San Luis Obispo County through the city of Fresno to Yosemite National Park. It is a two-lane, rural, undivided highway north of the Children's Boulevard interchange to Yosemite National Park, a four-lane north/south freeway from Children's Boulevard to Friant Road, and a six-lane freeway south of Friant Road through the city of Fresno. SR-41 parallels the Project Site to the west. In 2020, Caltrans approved the Madera 41 South Expressway Project which includes the widening of SR-41 and other improvements along the segment of SR-41 that runs parallel to the proposed Rio Mesa Boulevard alignment. That project envisions future development of an interchange at the SR-41/Avenue 12 intersection.
- **Road 204** is a two lane, east/west roadway that extends from SR-41 (between Avenues 14 and 15) to Killarney Road near Sumner Hill. Road 204 bisects Tesoro Viejo. The easterly Road 204 connection to SR 41 is ultimately eliminated under the Tesoro Viejo plan.
- **Avenue 12** forms the southern boundary of the Project site and extends from east of SR-41 to west of SR-99. It is a two-lane roadway which is ultimately planned to be a four-lane, divided arterial. Future plans include the extension of Avenue 12 through the RMAP development and an interchange with SR-41.
- **Avenue 15** is a two-lane, east/west, rural road which extends from the City of Madera to SR-41 and into Tesoro Viejo. Portions of the roadway provide access to residential and commercial uses. Future plans call for Avenue 15 to be a four-lane, divided arterial with an interchange at SR-41.

The completion of the project will have an effect on intersections along the SR 41 corridor from Avenue 12 to Avenue 15.

The **SR 41 / Avenue 15 intersection** is controlled by a traffic signal. The intersection has two through travel lanes in each direction on SR 41 plus separate left turn and right turn lanes. The eastbound Avenue 15 approach has a separate left turn lane and combined through plus right turn lane. The westbound approach has a left turn lane, through lane and separate right turn lane.

The **SR 41 / County Road 204 intersection** lies about ½ mile south of Avenue 15. This intersection is controlled by stop signs on the County Road 204 approaches. Separate left turn lanes are provided in each direction on SR 41. Traffic entering SR 41 at this location is limited to "right-turns only;" and ultimately SR 41 access to Tesoro Viejo will be eliminated. Under the opening day conditions assessed herein the intersection is assumed to continue to permit access from Tesoro Viejo.

The **SR 41 / Avenue 12 intersection** is controlled by an actuated traffic signal. SR 41 has been widened to provide dual northbound left turn lanes, a single northbound through lane and a long northbound right turn lane. Southbound SR 41 has a single left turn lane, two through lanes and a right turn lane. Each Avenue 12 approach has two entry lanes configured as a combined left+through lane and a separate right turn lane.

Existing Traffic Volumes. Current traffic volume data was collected at study area intersections on May 23, 2019. These traffic counts are included in the appendix to this report.

Intersection Level of Service. The observed peak hour volumes are the basis for intersection LOS calculations based on the methodologies contained in the 2010 HCM. The peak hour volumes and LOS results are presented in Table 1, and LOS worksheets are in the appendix.

TABLE 1
CURRENT INTERSECTION LEVEL OF SERVICE

Intersection	Control	Year 2019			
		AM Peak Hour		PM peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
SR 41 / Avenue 15	Signal	22.9	C	20.0	B
SR 41 / Co Road 204					
Eastbound Approach	EB/WB Stop	18.4	C	13.1	B
Westbound Approach		11.5	B	19.6	C
SR 41 / Avenue 12	Signal	59.5	E	44.7	D

Roadway Segment Level of Service. The observed peak hour volumes are the basis for roadway segment LOS calculations based on the methodologies contained in the 2010 HCM. The peak hour volumes and LOS results are presented in Table 2, and LOS worksheets are included in the appendix.

TABLE 2
EXISTING ROADWAY SEGMENT LEVELS OF SERVICE

Street	Location	Direction	Year 2019			
			AM Peak Hour		PM Peak Hour	
			Volume (vph)	LOS	Volume (vph)	LOS
SR 41	North of Avenue 12 to Road 204 (2 lanes)	NB	447	C	1,049	E
		SB	953	E	629	D
	Road 204 to Avenue 15 (2 lanes)	NB	468	D	990	E
		SB	944	E	624	D
Avenue 12	East of SR 41 (2 lanes)	EB	14	A	15	A
		WB	2	A	31	A

Opening Day (Year 2022) Traffic Conditions

Assumptions. Opening day with Phase 1 conditions assume that:

- The proposed project has been built as a two-lane road linking Tesoro Viejo Blvd and Avenue 12.
- Background traffic volumes on study area roads increases by 2% annually.
- Development occurs in the northern end on the Tesoro Viejo community as noted below.
    - 2019 post traffic counts:
        - 1 – Coffee Shop
        - 1 – Welcome Center
        - 1 – Title Company
        - 16 – Model Homes
    - 2020:
        - 86 – additional homes
    - 2021:
        - 300 – additional homes
        - 1 – Urgent Care clinic
        - 1 – Gas Station/Convenience store
    - 2022:
        - 300 – additional homes
        - 1 – Hotel 80 rooms

Forecasting Methodology. A two-step process was employed to create Opening Day volumes. First, background Year 2019 traffic volumes were increased by applying a 2% annual straight line growth rate (i.e., 6% increase to Year 2022).

Secondly, the trip generation associated with Tesoro Viejo development occurring from the time that traffic counts were made in 2019 until opening day was estimated and assigned to the study area street system based on current regional distribution patterns occurring at study intersections and the general least time path along alternative routes once Rio Mesa Blvd is constructed.

Table 3 presents the trip generation estimate for the projects that would likely generate "external" traffic under Year 2022 conditions. Some of these uses (i.e., Welcome Center, Coffee shop, etc.) will create trips that remain almost entirely internal to Tesoro Viejo and would not add to the volume of traffic on SR 41 or eventually on Rio Mesa Blvd. Some uses may have both internal and internal trips.

TABLE 3
INITIAL TESORO VIEJO DEVELOPMENT TRIP GENERATION ESTIMATE

Land Use	**Quantity**	**Daily**	**AM Peak Hour**			**PM Peak Hour**		
			In	**Out**	**Total**	**In**	**Out**	**Total**
Single Family Residential	1 du	9.44	25%	75%	0.74	63%	37%	0.99
	686	5,712	127	381	508	428	251	679
	Internal School	200	58	58	116	0	0	0
	Internal	828	18	20	38	25	26	51
	External	4,684	51	303	354	403	225	628
Urgent Care Clinic	1 ksf	24.94	50%	50%	1.12	46%	54%	1.52
	17.0	424	10	9	19	12	14	26
	Internal	212	5	4	9	6	7	13
	External	212	5	5	10	6	7	23
Gas Station w/ C store	Fueling Position	205.36	51%	49%	12.47	51%	49%	13.99
	12	2,464	76	74	150	86	82	168
	Pass-by	1,232	47	47	94	47	47	94
	Internal	616	15	14	29	20	18	38
	External	616	14	13	27	19	17	36
Total External		5,512	70	321	391	428	249	687

The directional distribution of Tesoro Viejo trips will be expected to follow current travel patterns and be primarily directed to the south. Table 4 presents the assumptions made for this analysis.

TABLE 4
INITIAL TESORO VIEJO DEVELOPMENT TRIP DISTRIBUTION ASSUMPTIONS

Direction	Route	Percentage of Total Trips
North	SR 41 beyond Avenue 15	10%
West	Avenue 15 beyond SR 41	5%
	Avenue 12 beyond SR 41	5%
South	SR 41 beyond Avenue 12	80%

In the short term the assignment of Tesoro Viejo area traffic will reflect the locations of the initial development relative to overall circulation system, the quality of access to SR 41 from the east and the relative difference in travel time along Rio Mesa Blvd and SR 41. Signalized access to SR 41 is available at both Avenue 12 and Avenue 15. The travel speed on Rio Mesa Blvd Phase 1 is roughly 40 mph, while the speed on SR 41 under unconstrained conditions is in the range of 55-60 mph. Initially the distance to the Avenue 12 intersection on SR 41 from the pending short term growth areas in Tesoro Viejo is about 1 mile longer via Rio Mesa Blvd than via the SR 41 / Avenue 15 intersection.

Based on these considerations we have assumed that when Rio Mesa Blvd is constructed inbound traffic to Tesoro Viejo from the south will be split between Rio Mesa Blvd (45%), SR 41 at Road 204 (10%) and SR 41 at Avenue 15 (45%). Exiting traffic to the south is assumed to be divided 25% via Rio Mesa Blvd and 75% via Avenue 15.

Traffic Volumes / Level of Service. Figures 1 and 2 (attached) present Year 2020 a.m. and p.m. peak hour traffic volumes under these conditions without and with Rio Mesa Blvd Phase 1.

Intersection Levels of Service. The quality of Year 2022 traffic flow conditions has been determined and described in terms of operating Level of Service. Intersection Levels of Service were calculated using the methodologies contained in the 2010 Highway Capacity Manual (HCM), and the results are noted in Table 5.

The Rio Mesa Blvd Phase 1 project has a positive effect on traffic conditions during the p.m. peak hour, as northbound traffic that would otherwise be in the single northbound travel lane on SR 41 can be diverted to Avenue 12 to Rio Mesa Blvd. This reduces the average delay at that time at the signalized intersections on SR 41. However, while a positive effect is also expected at the SR 41 / Avenue 15 intersection in the a.m. peak hour, diversion of southbound SR 41 traffic to westbound Avenue 12 has a negative effect on the operation of the SR 41 / Avenue 12 intersection at that time.

In the near term, measures to improve the operation of the SR 41 / Avenue 12 intersection in the a.m. peak hour would need to involve creating additional capacity for the large number of vehicles turning right from eastbound Avenue 12 onto southbound SR 41. Widening southbound

SR 41 to create an exclusive merge lane for the those turns would deduce delay, and in the long term a grade separated interchange is planned. Widening westbound Avenue 12 would not have an appreciable effect on near term traffic conditions.

Level of Service on Roadway Segments. Year 2022 roadway segment Levels of Service are noted in Table 6. Overall, conditions on the two-lane segments of SR 41 will continue to exceed the LOS D standard for the area. However, Rio Mesa Blvd Phase 1 will allow some traffic to be diverted from SR 41 which will have a positive impact on travel on the highway.

TABLE 5
YEAR 2022 INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour			
		No Project		With Rio Mesa Blvd Phase 1		No Project		With Rio Mesa Blvd Phase 1	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
SR 41 / Avenue 15	Signal	51.8	D	51.1	D	76.5	E	31.9	C
SR 41 / Co Road 204									
Eastbound Approach	EB/WB Stop	28.4	D	26.0	D	17.0	C	16.1	C
Westbound Approach		12.5	B	12.3	B	33.0	D	26.8	D
SR 41 / Avenue 12	Signal	120.2	F	130.5	F	94.5	F	74.5	E

TABLE 6
YEAR 2022 ROADWAY SEGMENT LEVELS OF SERVICE

Street	Location	Direction	AM Peak Hour				PM Peak Hour			
			No Project		With Rio Mesa Blvd Phase 1		No Project		With Rio Mesa Blvd Phase 1	
			Volume (vph)	LOS	Volume (vph)	LOS	Volume (vph)	LOS	Volume (vph)	LOS
SR 41	North of Avenue 12 to Road 204 (2 lanes)	NB	534	D	519	D	1,495	E	1.336	E
		SB	1,261	E	1,234	E	891	E	839	E
	Road 204 to Avenue 15 (2 lanes)	NB	556	D	536	D	1,350	E	1,219	E
		SB	1,292	E	1,224	E	885	E	833	E
Avenue 12	East of SR 41 (2 lanes)	EB	15	A	39	A	17	A	184	C
		WB	5	A	70	B	37	B	86	B

CUMULATIVE LONG TERM CONDITIONS

Rio Mesa Blvd is an important element in the area circulation system and has been included in the long-term planning for the Rio Mesa area of Madera County for some time. The project has been reflected in environmental documents prepared for development proposals on both sides of SR 41.

Basis for Traffic Volume Forecasts

The volume of traffic using Rio Mesa Blvd will vary over the year as development occurs. The volume occurring at any individual location along the roadway will vary based on where development occurs. For this analysis the following was taken to develop traffic volume forecasts that reflect continuing regional growth and specific development in the area along Rio Mesa Blvd.

Year 2042 traffic volumes were created using the current version of the Madera County Transportation Commission (MCTC) regional travel demand forecasting model. The traffic model anticipates future development in the Rio Mesa area, and model's assumptions for the area west of SR 41 and east of SR 41 in the area north of Avenue 15 and south beyond Avenue 12 intersection were retained.

Specific development assumptions were developed in consultation with Madera County staff for the area east of SR 41 around and between Avenue 12 and Avenue 15. The following projects are assumed to be fully developed, however other potential growth identified by Year 2042 in the MCTC traffic model was not assumed in this area.

A. Tesoro Viejo
B. Paseo Pacifico
C. Children's Medical Center
D. Chawanakee USD High School

The land use quantities assumed in each of these four locations are based on the attachments and are summarized in Table 7, along with their gross trip generation before internal match and pass-by reductions.

TABLE 7
YEAR 2042 LAND USE ASSUMPTIONS

Name	**Residential (DU's)**				**Commercial (ksf)**					**Office / Industrial (ksf)**				**Public (ksf)**
	HDR	**MDR**	**LDR**	**VLDR**	**Highway Serving**	**Visitor**	**NC**	**CC**	**Rec**	**Prof**	**Medical**	**Hospital**	**LI**	
Tesoro Viejo	673	2,080	1,806	631	1,129.7	24.0	91.5	775.4	5.5	259.2	0	0	432.4	76.2
Paseo Pacifico	0	166	603	0	0	0	0	0	0	0	-	0	638.0	0
CMC	0	0	0	0	0	0	0	0			150.7	336.6	0	0
Chawanakee USD HS	0	0	0	0	0	0	0	0				0	0	1,500 students
Total	673	2,246	2,409	631	1,129.7	24	91.5	775.4	5.5	259.2	150.7	336.6	1070.4	1.500
Daily Trips	4,994	21,202	22,741	5,957	42,646	904	5,649	29,270	206	2,524	5,124	3,609	5,309	3.045
AM Peak Hour Trips	310	1,662	1,783	467	1,062	23	197	729	5	301	419	300	749	780
PM Peak Hour Trips	277	2,224	2,385	625	4,304	91	508	2,954	21	298	520	327	674	210

An incremental approach was taken to create Year 2042 intersection turning movements at study locations based on the difference in model base year and Year 2042 forecasts. Daily and a.m. / p.m. model segment and intersection approach volumes were identified. The difference between model forecasts was identified and added to the current traffic volumes to created adjusted 2040 volumes. At intersections these adjusted approach volumes were used to project intersection turning movements using the methodology identified in the Transportation Research Board's (TRB's) NCHRP Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*. This approach reflects the fact that the development of various land uses may affect current travel patterns while adding new traffic, while new roadways, like Rio Mesa Blvd may provide alternative routes for existing traffic.

Roadway Improvements

This analysis assumes that the following regional circulation system improvements have been made by 2042:

- Implementation of the SR 41 Expressway Project to provide two travel lanes in each direction on SR 41 through the study area. Access to Tesoro Viejo via SR 41 at Road 204 is not permitted.
- Rio Mesa Blvd has been widened to a four-lane section (i.e., Phase 2).
- Internal streets within the four identified development projects will be completed but other future elements of the overall Rio Mesa area circulation system, such as the Flag Barn Way extension north from Avenue 12 are not assumed.
- The fourth westbound lane at the SR 41 / Avenue 15 intersection that is not used today is restriped to provide a second left turn lane.

Daily Traffic Volume Forecasts

Table 9 summarizes daily traffic volumes on study area roads under Year 2042 conditions, as well as under previous scenarios.

As indicated, under these conditions the daily traffic volume on Rio Mesa Blvd north of Avenue 12 is projected to reach 17,900 ADT. While Madera County does not have an adopted standard for Level of Service based on daily traffic volume, other sources were reviewed in order to confirm that the proposed project will result in conditions that are consistent with the requirements of the Madera County General Plan and to suggest when Phase 2 improvements may need to be implemented.

The most commonly accepted Level of Service thresholds based on daily traffic volume are produced by the Florida Department of Transportation (FDOT). Applicable thresholds are presented in Table 8. As shown the two-lane Rio Mesa Blvd Phase 1 can accommodate 15,900 ADT at the General Plan LOS D standard, and Rio Mesa Blvd will need to be widened to a 4-lane section when the daily volume exceeds that level. Assuming a uniform growth rate from Year 2022 to Year 2042 suggest that this traffic volume level might be reached in 18 years, but the actual volume will be dependent on the location of development.

TABLE 8 GENERALIZED ANNUAL AVERAGE DAILY VOLUME LOS THRESHOLDS					
Lanes	**Treatment**	**LOS B**	**LOS C**	**LOS D**	**LOS D With Non-State Adjustment**
2	Undivided	*	16,800	17,700	15,900[1]
4	Divided	*	37,900	39,800	-
6	Divided	*	58,400	59,900	-

Source: FDOT Generalized Annual Average Daily Volume LOS Thresholds, 2012
[1] Reduced by 10% for non-state signalized roadway

Similarly, the volume of traffic on Avenue 12 east of SR 41 will warrant a four-lane section in the future.

Intersection Operations

Figure 3 presents Year 2042 peak hour traffic volumes at study area intersections as developed from traffic model forecasts. Table 10 presents resulting intersection Levels of Service assuming improvements noted earlier.

As indicated, the two signaled intersections on SR 41 are forecast to operate at LOS F during peak traffic hours. Additional improvements would be needed to satisfy the Madera County General Plan's minimum LOS D standard. While it might theoretically be possible to increase the capacity of each intersection to reduce delays and improve the Level of Service, the long range plan for the SR 41 corridor identifies grade separated interchanges at each location. At its proposed location the Rio Mesa Blvd intersection on Avenue 12 is roughly ½ mile from the existing centerline of SR 41. This location would provide adequate separation from the future northbound SR 41 ramps intersection, and thus the Rio Mesa Blvd project does not interfere with the eventual implementation of this planned improvement.

Under these conditions the Avenue 12 / Rio Mesa Blvd intersection is forecast to operate with Level of Service satisfying the minimum LOS D standard with side street stop sign control. Theoretically a traffic signal may be needed at this location at some point in the future as the area to the east develops, but the Rio Mesa Blvd project does not interfere with future signalization by Madera County, if needed.

Roadway Segment Level of Services

Table 11 notes the Level of Service on SR 41 segments assuming the roadway is widened to four lanes. As shown, the segments are projected to operate at LOS A or B, which satisfies the General Plan minimum standard. On Avenue 12 the Level of Service is projected to be LOS D / LOS E in the p.m. peak hour, and a four-lane section will be needed to meet the LOS D standard.

TABLE 9
DAILY TRAFFIC VOLUME SUMMARY

Facility	Location	Daily Traffic Volume			
		2019	2022	2022	2042
		No Project	No Project	With Project	With Project
SR 41	North of Avenue 15	15,100	16,900	16,900	32,600
SR 41	Avenue 12 to Avenue 15	20,200	26,500	24,900	34,300
SR 41	South of Avenue 12	32,500	39,500	39,500	56,200
Tesoro Viejo Blvd	East of SR 41	1,500 (e)	6,900	5,300	37,400
Avenue 12	East of SR 41	360 (e)	400	2,100	15,700
Rio Mesa Blvd	North of Avenue 12	0	0	1,700	17,900

(e) value estimated from peak hour traffic

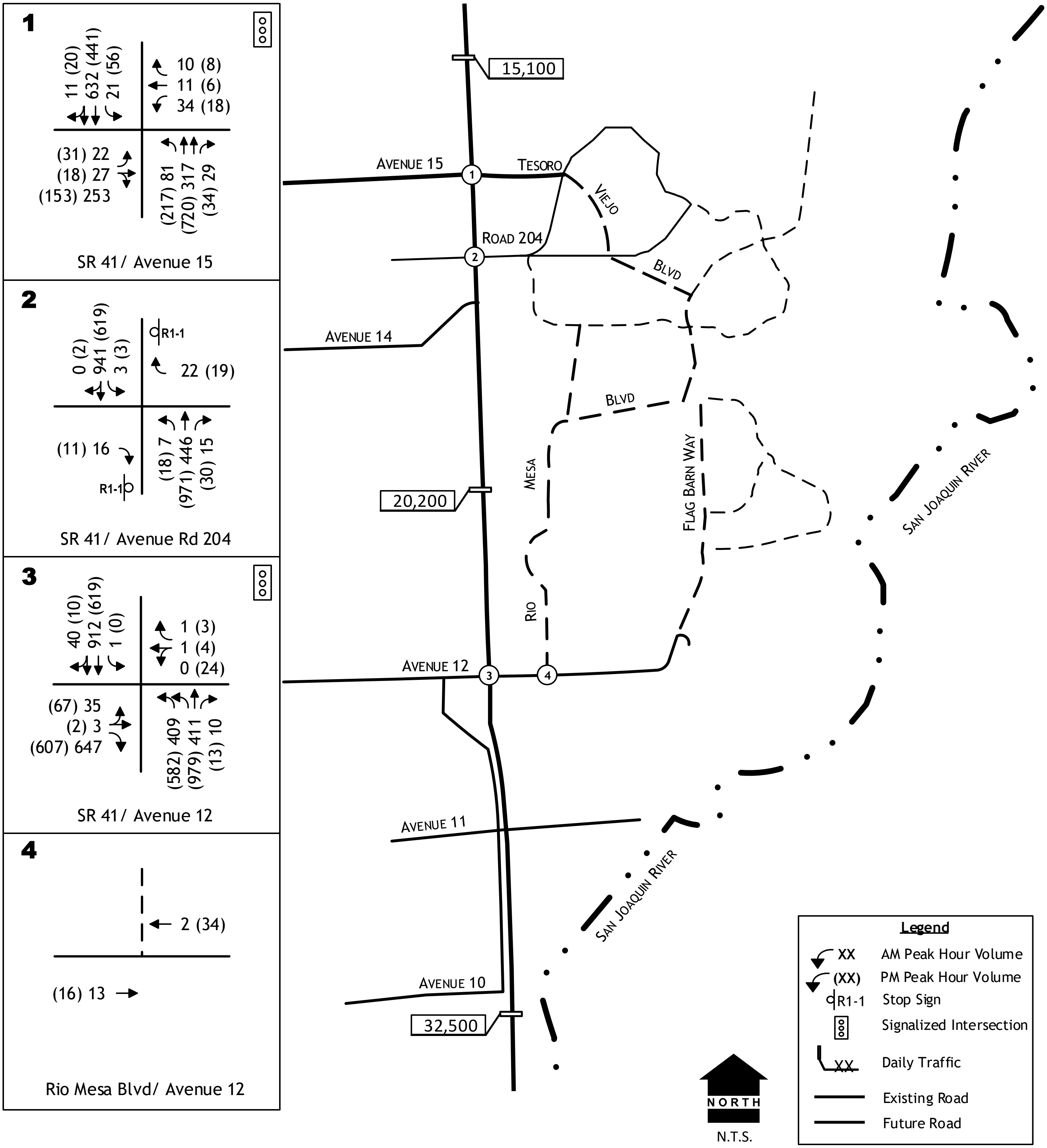
TABLE 10
YEAR 2042 INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
SR 41 / Avenue 15	Signal	45.9	D	135.9	F
SR 41 / Avenue 12	Signal	204.5	F	201.8	F
Avenue 12 / Rio Mesa Blvd Eastbound approach	SB Stop	9.3	A	25.9	D

TABLE 11
YEAR 2042 ROADWAY SEGMENT LEVELS OF SERVICE

Street	Location	Direction	Lanes	Year 2041			
				AM Peak Hour		PM Peak Hour	
				Volume (vph)	LOS	Volume (vph)	LOS
SR 41	Avenue 12 to Avenue 15	NB	2	630	A	1,575	B
		SB	2	1,220	B	1,070	A
	North of Avenue 15	NB	2	500	A	1,390	B
		SB	2	1,275	B	820	A
Avenue 12	SR 41 to Rio Mesa Blvd	EB	1	260	C	565	E
		WB	1	200	C	700	D

APPENDIX

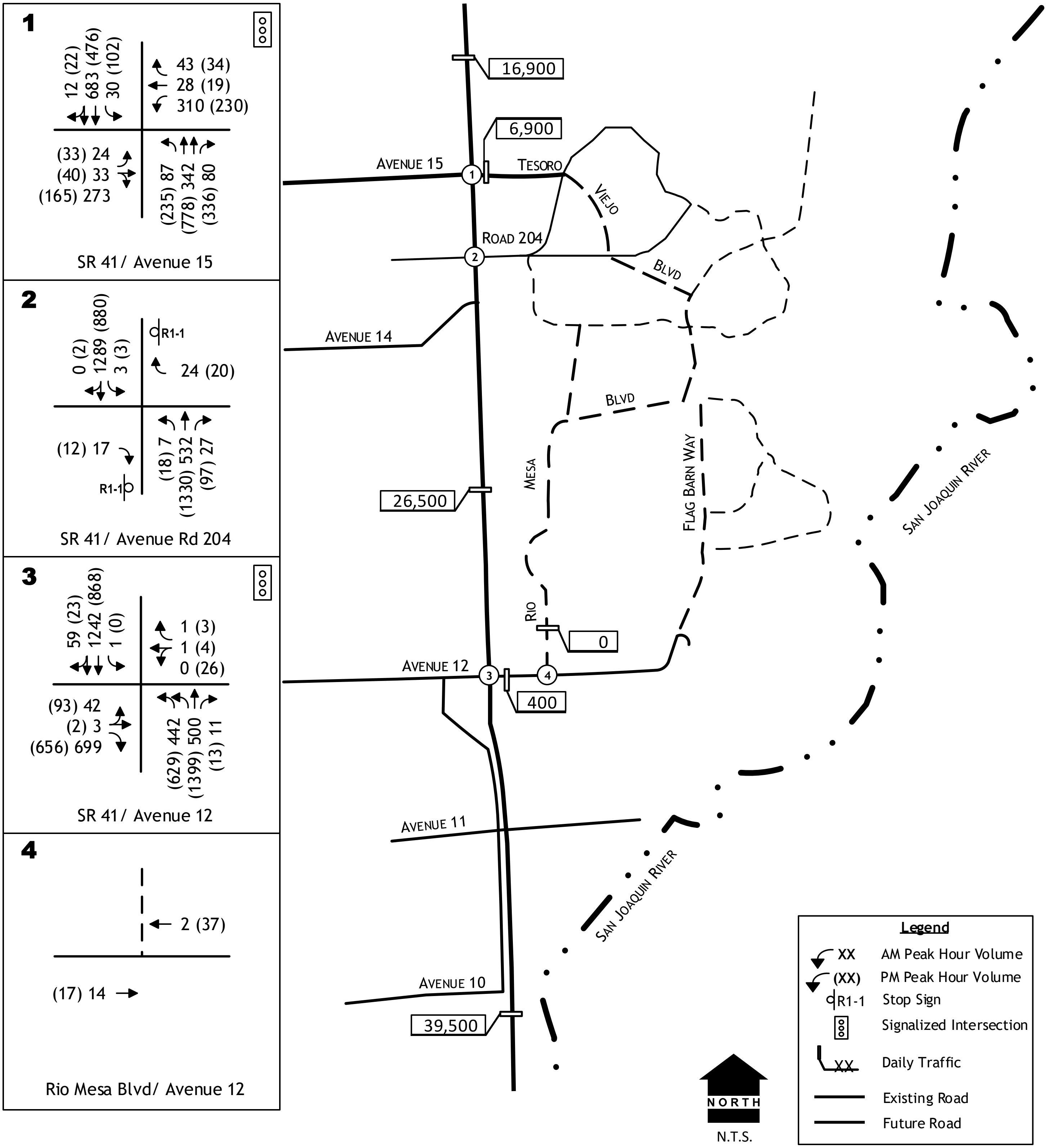


YEAR 2019 WITHOUT RIO MESA BLVD
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

4705-021 RA 9/22/2017

figure 1

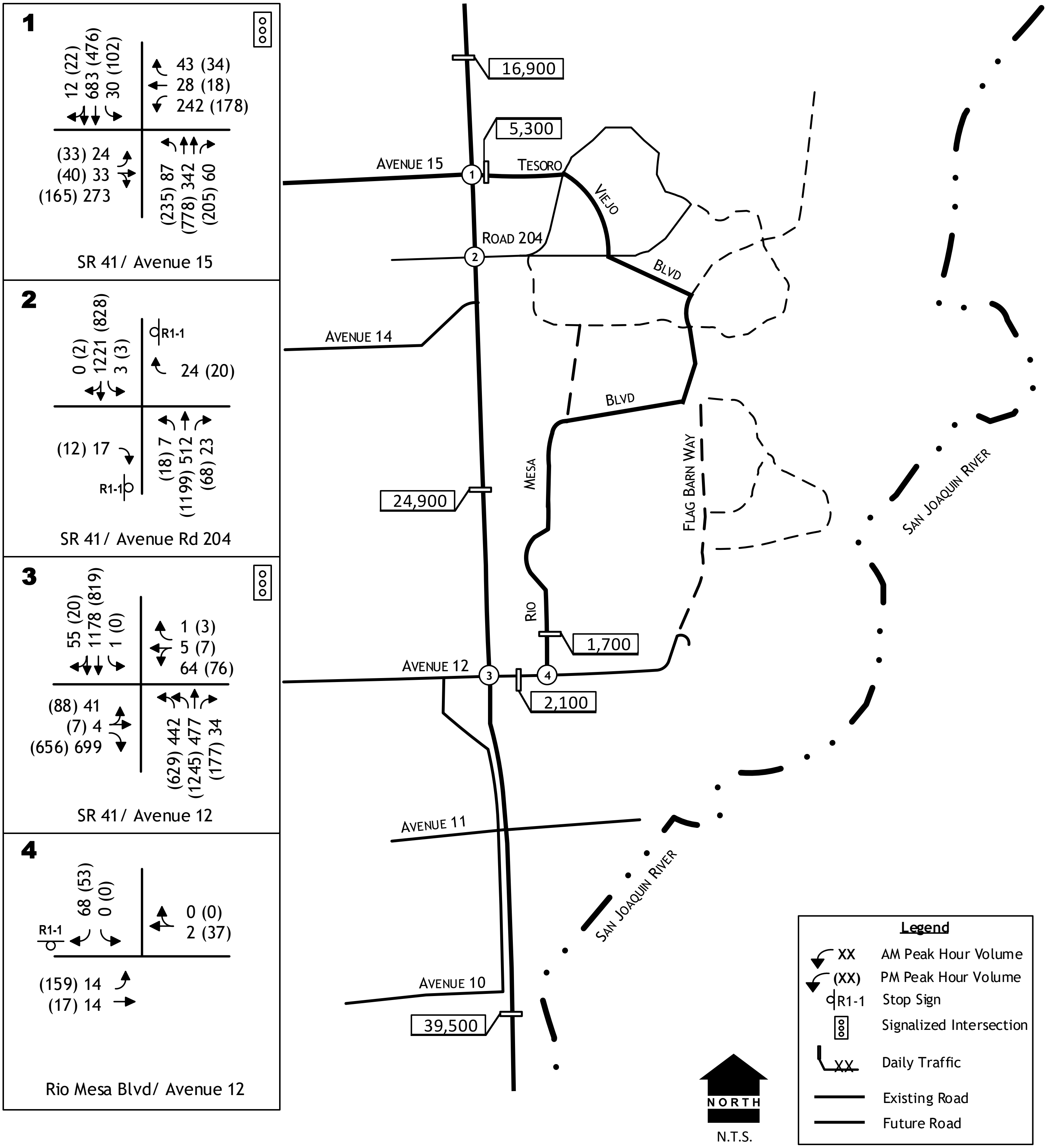


YEAR 2022 WITHOUT RIO MESA BLVD
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

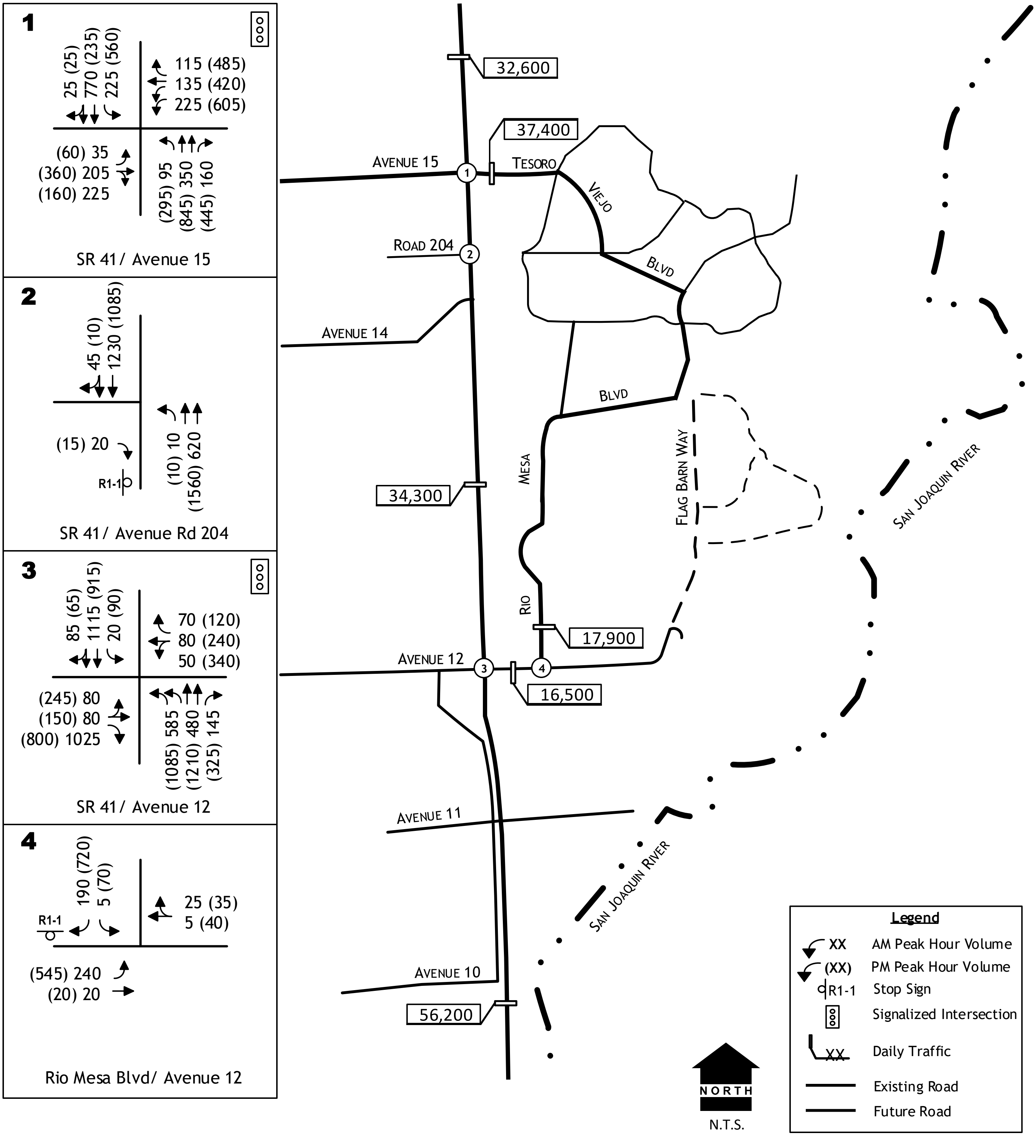
4705-021 RA 9/22/2017

figure 2



YEAR 2022 PLUS RIO MESA BLVD
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

figure 3



KD Anderson & Associates, Inc.
Transportation Engineers

YEAR 2042 PLUS RIO MESA BLVD TRAFFIC VOLUMES AND LANE CONFIGURATIONS

4705-021 RA 9/22/2017

figure 4

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 15 @ SR-41

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

LATITUDE 36.9668

LONGITUDE -119.7939

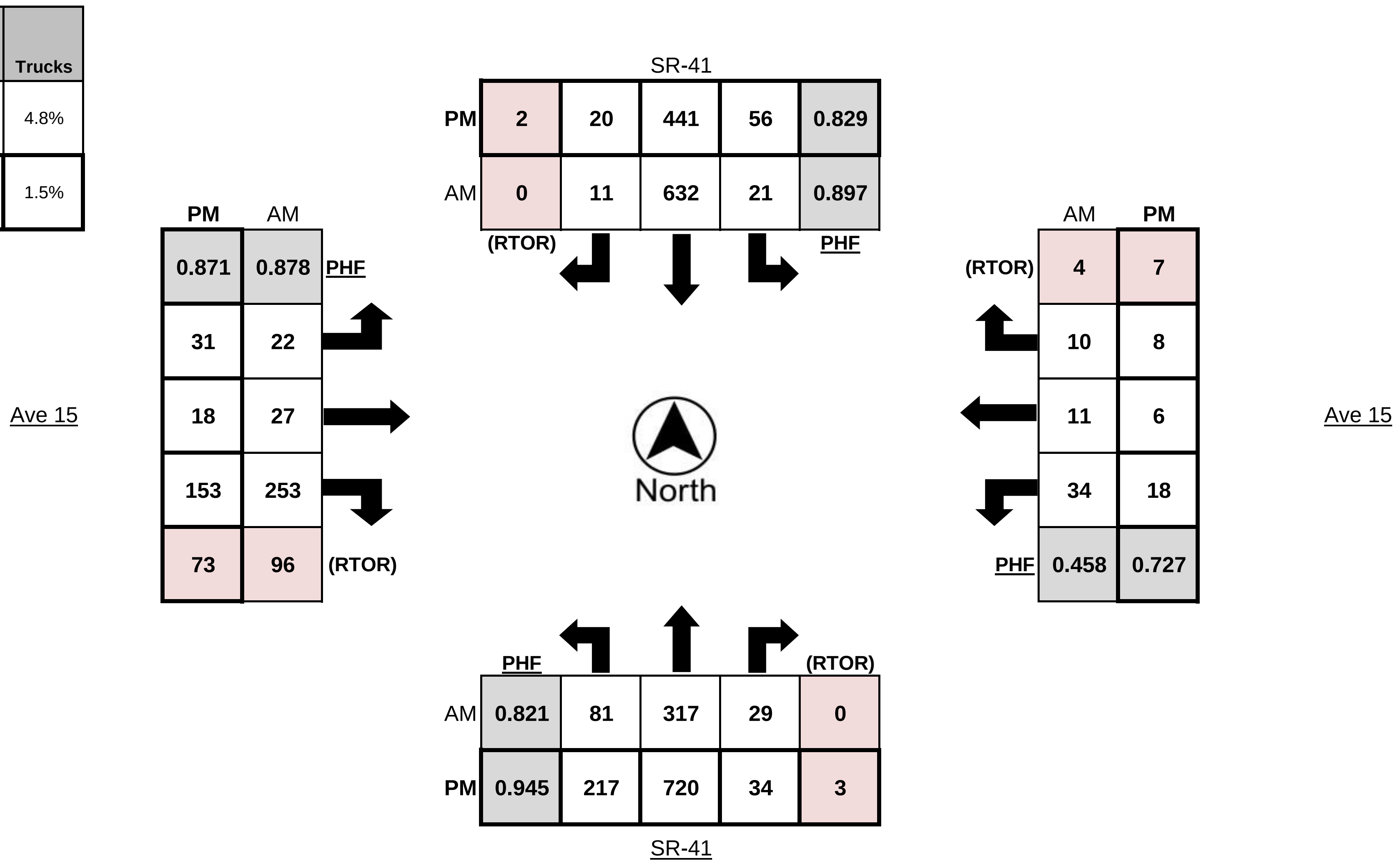
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	18	66	8	0	5	3	133	2	0	4	3	3	56	39	1	4	1	0	0	1
7:15 AM - 7:30 AM	20	90	10	1	7	2	167	4	0	4	6	3	43	26	0	2	3	0	0	0
7:30 AM - 7:45 AM	25	75	6	0	12	4	168	4	0	6	5	4	77	12	1	7	2	0	0	2
7:45 AM - 8:00 AM	23	72	8	0	9	1	140	2	0	5	5	3	60	31	1	0	1	2	1	1
8:00 AM - 8:15 AM	9	72	7	0	7	9	174	2	0	5	7	3	72	31	0	8	1	4	2	3
8:15 AM - 8:30 AM	24	98	8	0	11	7	150	3	0	3	5	17	44	22	3	19	7	4	1	0
8:30 AM - 8:45 AM	16	75	9	2	10	2	149	5	1	3	3	2	47	22	2	11	6	2	1	2
8:45 AM - 9:00 AM	12	80	3	0	10	3	166	5	0	6	3	1	36	10	1	2	3	0	0	0
TOTAL	**147**	**628**	**59**	**3**	**71**	**31**	**1247**	**27**	**1**	**36**	**37**	**36**	**435**	**193**	**9**	**53**	**24**	**12**	**5**	**9**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	41	185	6	0	2	3	112	9	2	3	7	0	27	12	0	10	5	3	2	1
4:15 PM - 4:30 PM	58	182	4	0	3	7	106	4	0	4	8	2	31	9	0	7	2	1	1	0
4:30 PM - 4:45 PM	46	168	7	1	2	8	121	2	0	3	4	4	25	13	0	2	3	2	1	0
4:45 PM - 5:00 PM	59	189	9	2	2	17	99	5	0	4	7	3	35	23	0	6	1	4	4	0
5:00 PM - 5:15 PM	49	175	9	0	4	13	107	7	1	4	11	4	33	18	2	5	1	1	1	0
5:15 PM - 5:30 PM	46	173	8	0	2	15	94	4	0	2	6	7	45	26	1	3	3	3	2	0
5:30 PM - 5:45 PM	63	183	8	1	1	11	141	4	1	2	7	4	40	6	1	4	1	0	0	0
5:45 PM - 6:00 PM	59	192	6	0	2	6	74	6	0	2	9	4	34	7	0	2	6	0	0	0
TOTAL	**421**	**1447**	**57**	**4**	**18**	**80**	**854**	**41**	**4**	**24**	**59**	**28**	**270**	**114**	**4**	**39**	**22**	**14**	**11**	**1**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	81	317	29	0	39	21	632	11	0	19	22	27	253	96	5	34	11	10	4	6
4:45 PM - 5:45 PM	217	720	34	3	9	56	441	20	2	12	31	18	153	73	4	18	6	8	7	0

	PHF	**Trucks**
AM	0.938	4.8%
PM	0.924	1.5%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 15 @ SR-41

LATITUDE 36.9668

COUNTY Madera

LONGITUDE -119.7939

COLLECTION DATE Thursday, May 23, 2019

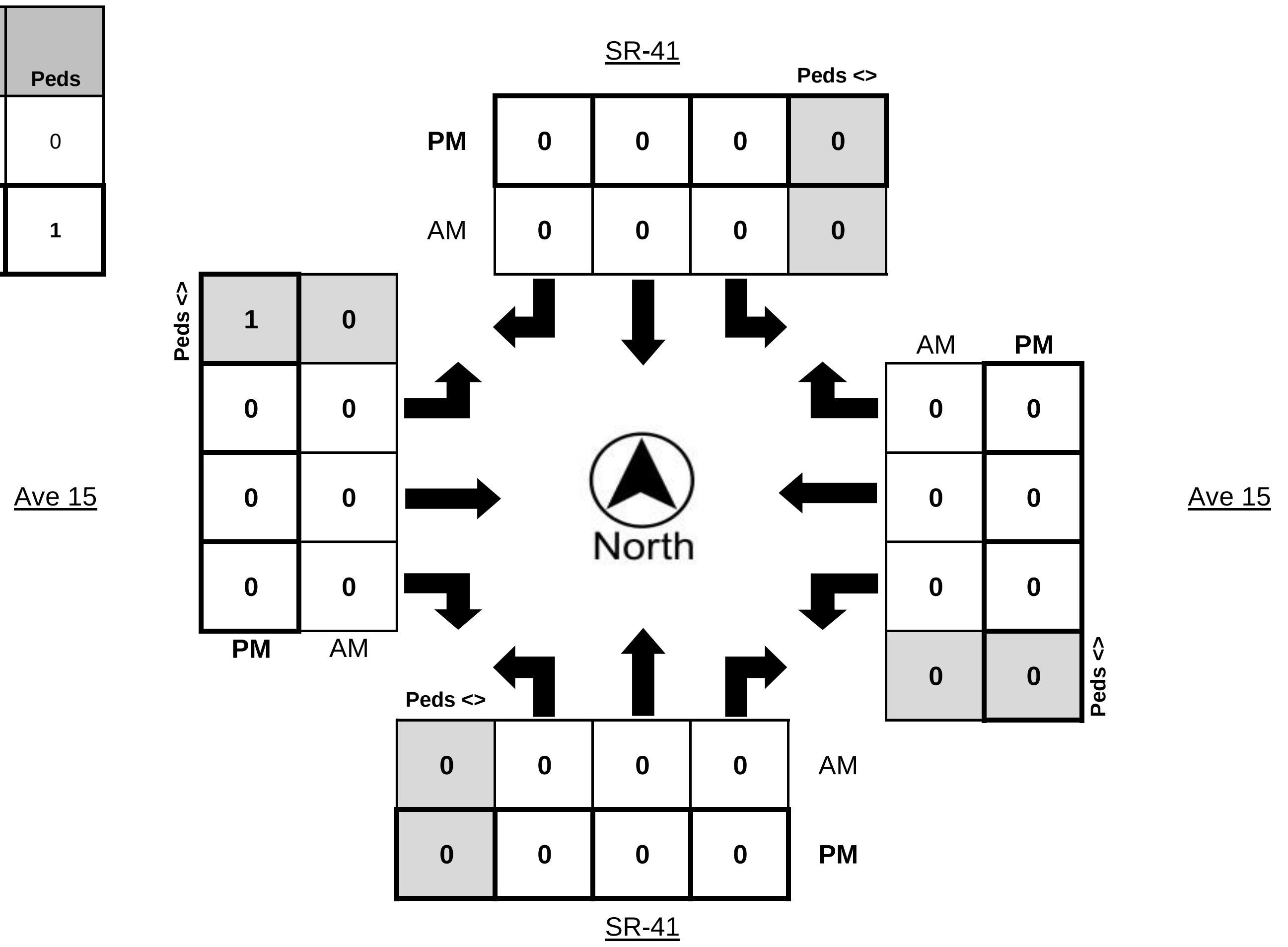
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	1



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

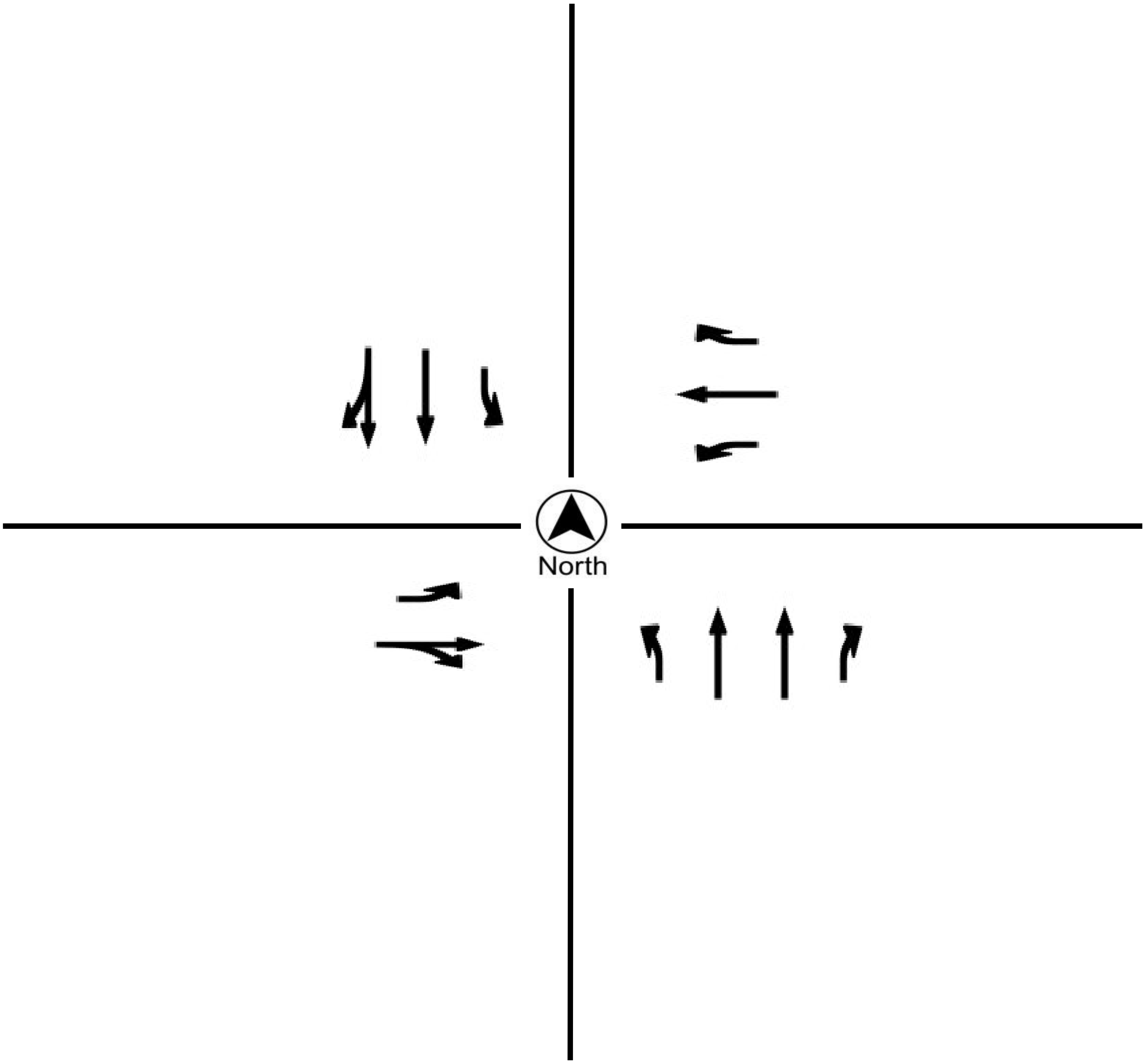
Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Ave 15 @ SR-41	**N/S STREET**	SR-41 / SR-41
COUNTY	Madera	**E/W STREET**	Ave 15 / Ave 15
COLLECTION DATE	Thursday, May 23, 2019	**WEATHER**	Clear
CYCLE TIME	86 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 14-1/2 @ SR-41

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

LATITUDE 36.9595

LONGITUDE -119.7940

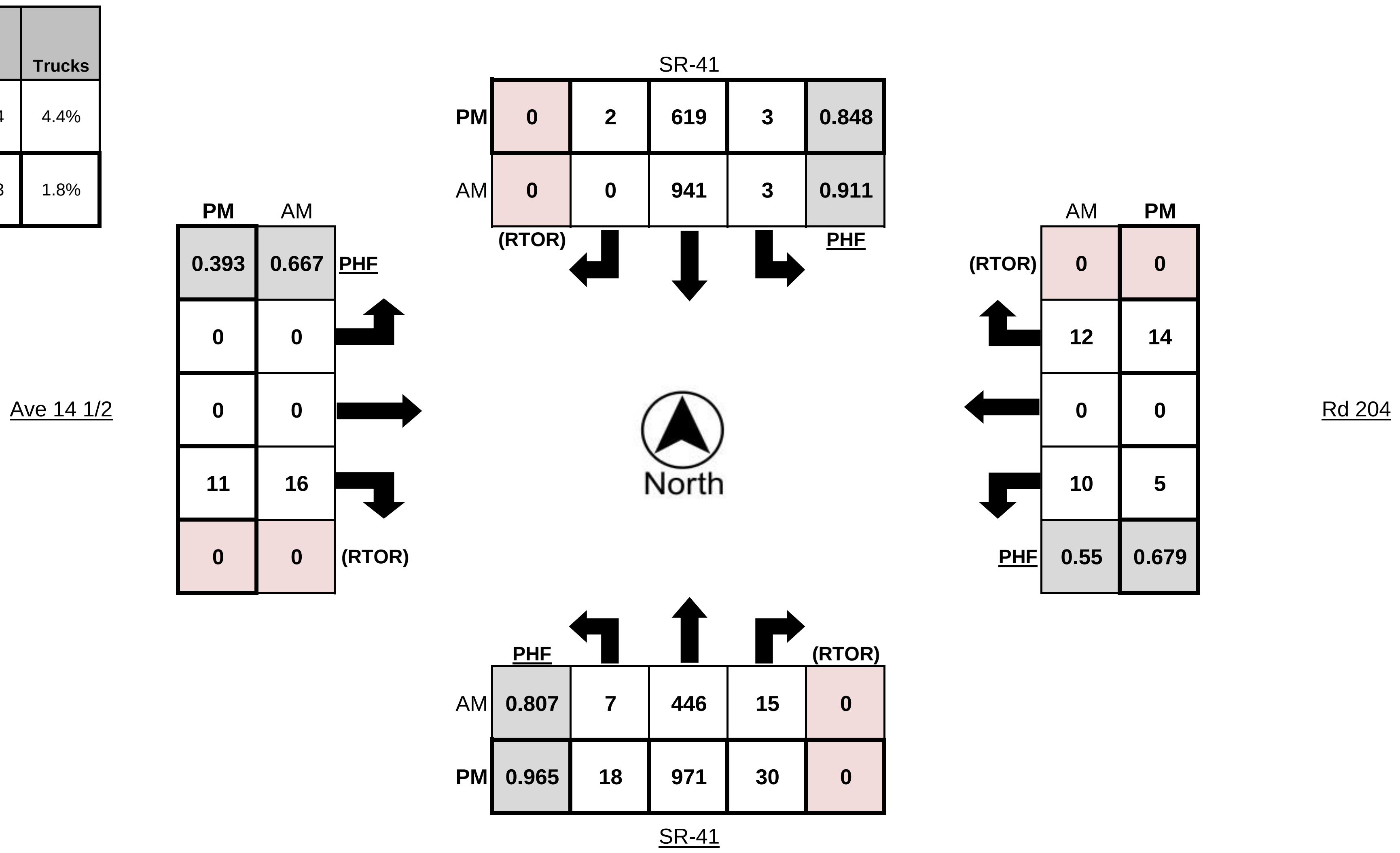
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	1	93	4	0	9	1	208	0	0	5	0	0	10	0	2	0	0	3	0	0
7:15 AM - 7:30 AM	1	132	3	0	7	1	200	1	0	5	0	0	5	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	1	108	2	0	8	1	258	0	0	9	0	0	4	0	1	3	0	7	0	0
7:45 AM - 8:00 AM	4	107	3	0	8	1	213	0	0	7	0	0	6	0	0	2	0	4	0	1
8:00 AM - 8:15 AM	0	95	3	0	9	0	255	0	0	5	0	0	3	0	0	2	0	0	0	0
8:15 AM - 8:30 AM	2	136	7	0	13	1	215	0	0	3	0	0	3	0	0	3	0	1	0	0
8:30 AM - 8:45 AM	2	101	4	0	7	0	203	0	0	4	0	0	1	0	0	2	0	4	0	0
8:45 AM - 9:00 AM	5	93	3	0	5	0	221	0	0	11	0	0	2	0	0	0	0	2	0	0
TOTAL	**16**	**865**	**29**	**0**	**66**	**5**	**1773**	**1**	**0**	**49**	**0**	**0**	**34**	**0**	**3**	**12**	**0**	**21**	**0**	**1**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	7	235	6	0	3	2	141	1	0	5	0	0	3	0	1	1	0	3	0	0
4:15 PM - 4:30 PM	6	244	8	0	8	0	164	1	0	2	0	0	4	0	1	1	0	3	0	0
4:30 PM - 4:45 PM	10	228	12	0	5	1	161	1	0	4	1	0	1	0	0	0	0	1	0	0
4:45 PM - 5:00 PM	7	249	8	0	5	0	146	0	0	4	0	0	7	0	2	2	0	5	0	0
5:00 PM - 5:15 PM	3	241	7	0	3	1	135	0	0	2	0	0	0	0	0	1	0	1	0	0
5:15 PM - 5:30 PM	5	244	5	0	5	1	156	1	0	5	0	0	3	0	0	1	0	5	0	0
5:30 PM - 5:45 PM	3	237	10	0	1	1	182	1	0	3	0	0	1	0	0	1	0	3	0	0
5:45 PM - 6:00 PM	2	264	7	0	6	1	131	0	0	3	0	0	6	0	1	1	0	3	0	0
TOTAL	**43**	**1942**	**63**	**0**	**36**	**7**	**1216**	**5**	**0**	**28**	**1**	**0**	**25**	**0**	**5**	**8**	**0**	**24**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:30 AM - 8:30 AM	7	446	15	0	38	3	941	0	0	24	0	0	16	0	1	10	0	12	0	1
4:45 PM - 5:45 PM	18	971	30	0	14	3	619	2	0	14	0	0	11	0	2	5	0	14	0	0

	PHF	Trucks
AM	0.944	4.4%
PM	0.953	1.8%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 14-1/2 @ SR-41

LATITUDE 36.9595

COUNTY Madera

LONGITUDE -119.7940

COLLECTION DATE Thursday, May 23, 2019

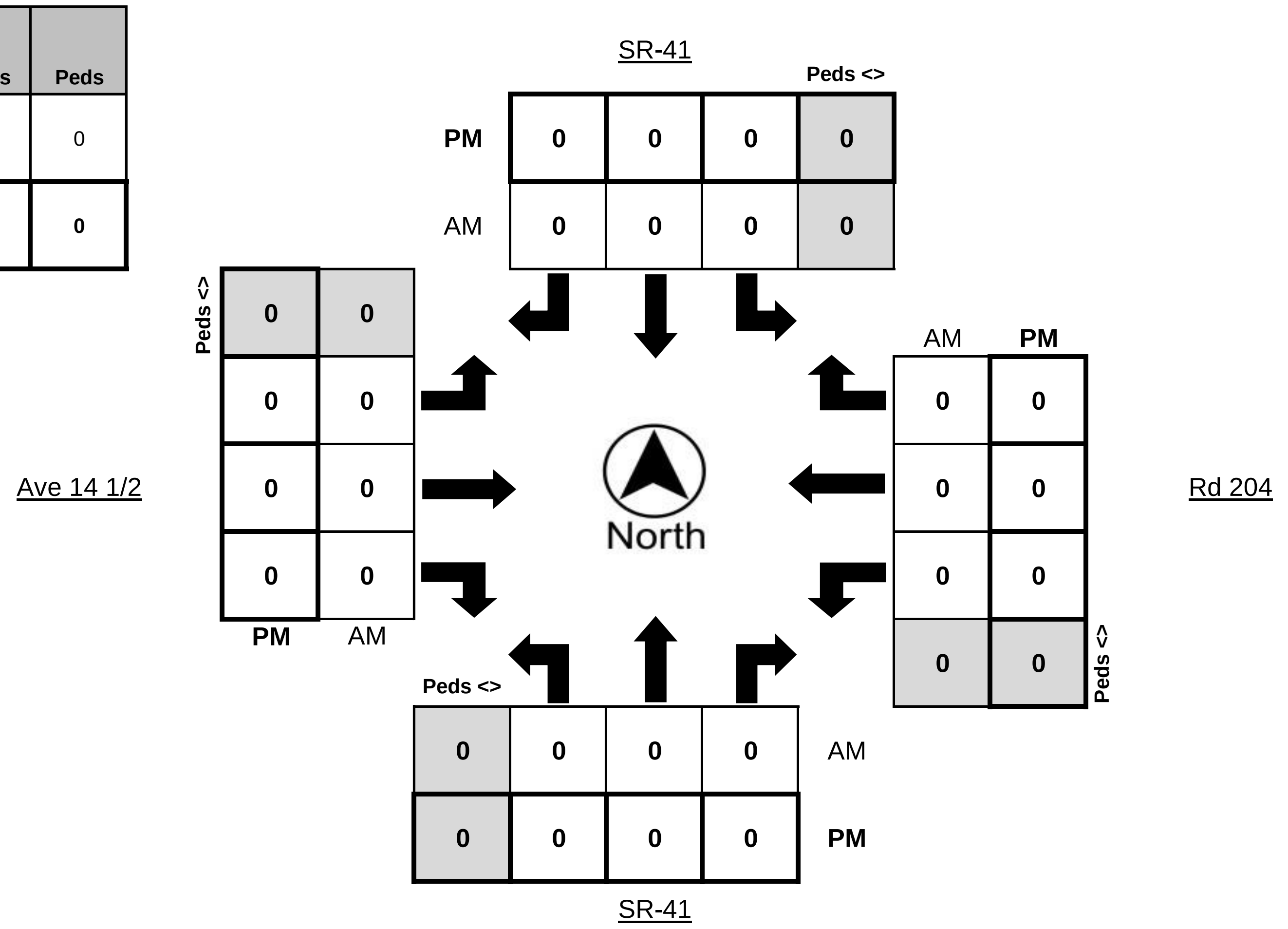
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 14-1/2 @ SR-41

N/S STREET SR-41 / SR-41

COUNTY Madera

E/W STREET Rd 204 / Ave 14 1/2

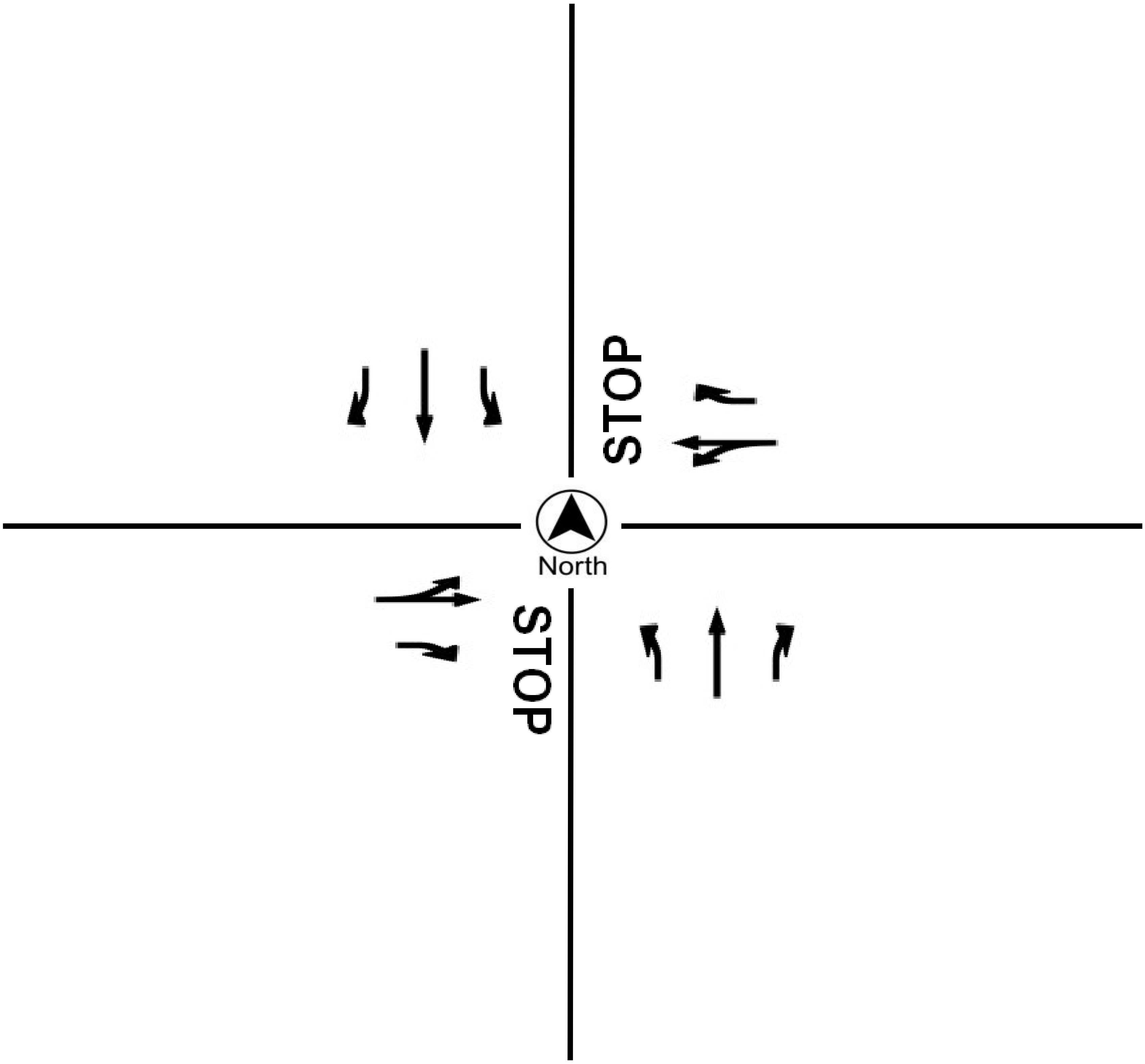
COLLECTION DATE Thursday, May 23, 2019

WEATHER Clear

CYCLE TIME N/A

CONTROL TYPE Two-Way Stop

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 14 @ SR-41

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

LATITUDE 36.9557

LONGITUDE -119.7940

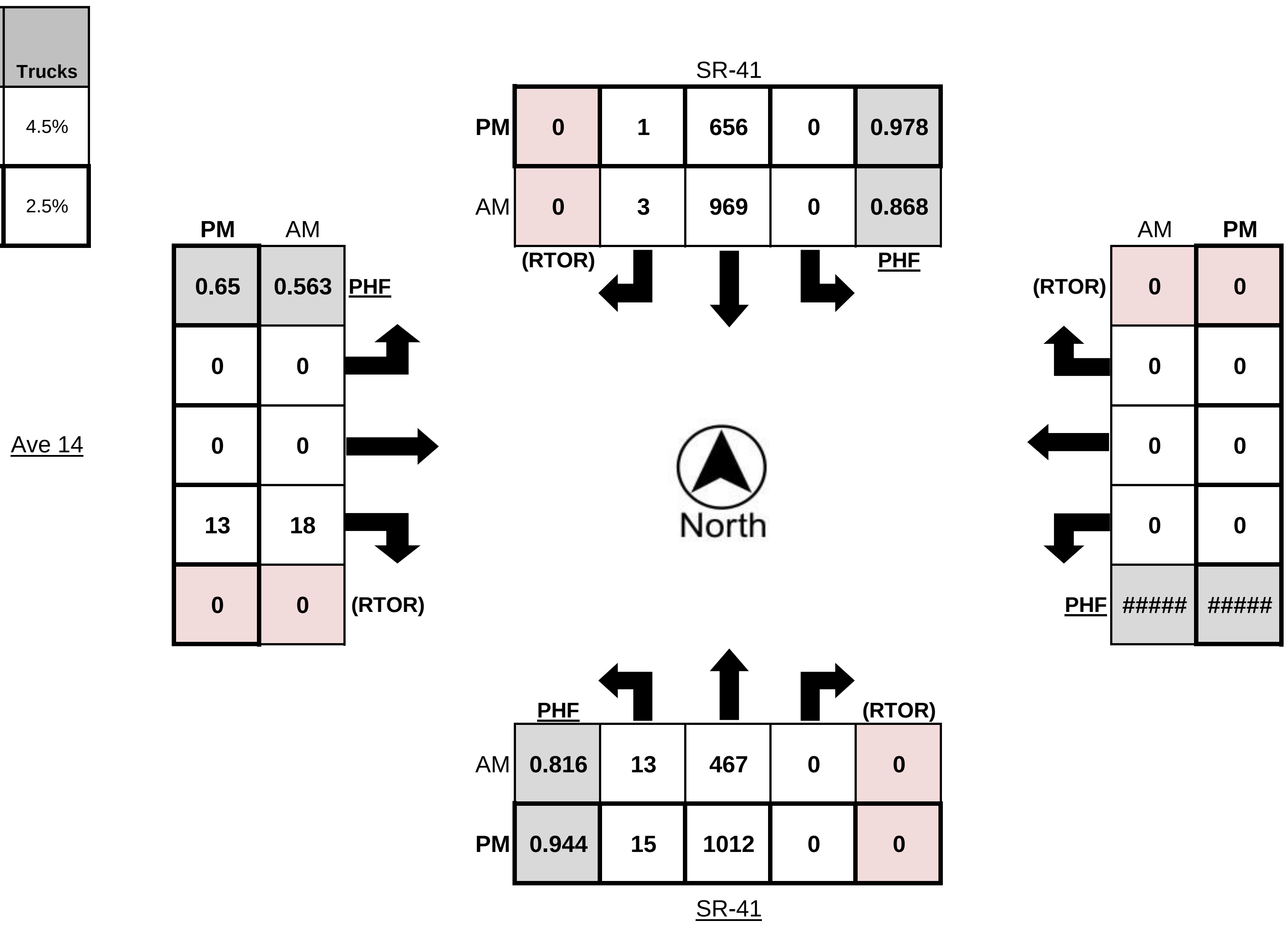
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	3	103	0	0	9	0	216	0	0	6	0	0	8	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	3	136	0	0	7	0	211	0	0	5	0	0	5	0	1	0	0	0	0	0
7:30 AM - 7:45 AM	4	106	0	0	9	0	257	0	0	8	0	0	5	0	3	0	0	0	0	0
7:45 AM - 8:00 AM	2	117	0	0	8	0	228	1	0	8	0	0	8	0	1	0	0	0	0	0
8:00 AM - 8:15 AM	2	102	0	0	8	0	279	1	0	5	0	0	2	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	5	142	0	0	12	0	205	1	0	3	0	0	3	0	1	0	0	0	0	0
8:30 AM - 8:45 AM	2	110	0	0	8	0	212	0	0	3	0	0	2	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	3	97	0	0	5	0	216	0	0	11	0	0	3	0	0	0	0	0	0	0
TOTAL	**24**	**913**	**0**	**0**	**66**	**0**	**1824**	**3**	**0**	**49**	**0**	**0**	**36**	**0**	**6**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	3	256	0	0	6	0	162	0	0	6	0	0	2	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	6	266	0	0	8	0	166	1	0	5	0	0	5	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	4	258	0	0	6	0	160	0	0	2	0	0	4	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	2	232	0	0	3	0	168	0	0	7	0	0	2	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	6	237	0	0	4	0	146	0	0	1	0	0	4	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	5	275	0	0	5	0	151	1	0	5	0	0	2	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	6	233	0	0	3	0	181	0	0	2	0	0	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	4	267	0	0	3	0	137	0	0	4	0	0	1	0	0	0	0	0	0	0
TOTAL	**36**	**2024**	**0**	**0**	**38**	**0**	**1271**	**2**	**0**	**32**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	13	467	0	0	37	0	969	3	0	24	0	0	18	0	5	0	0	0	0	0
4:00 PM - 5:00 PM	15	1012	0	0	23	0	656	1	0	20	0	0	13	0	0	0	0	0	0	0

	PHF	**Trucks**
AM	0.952	4.5%
PM	0.956	2.5%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

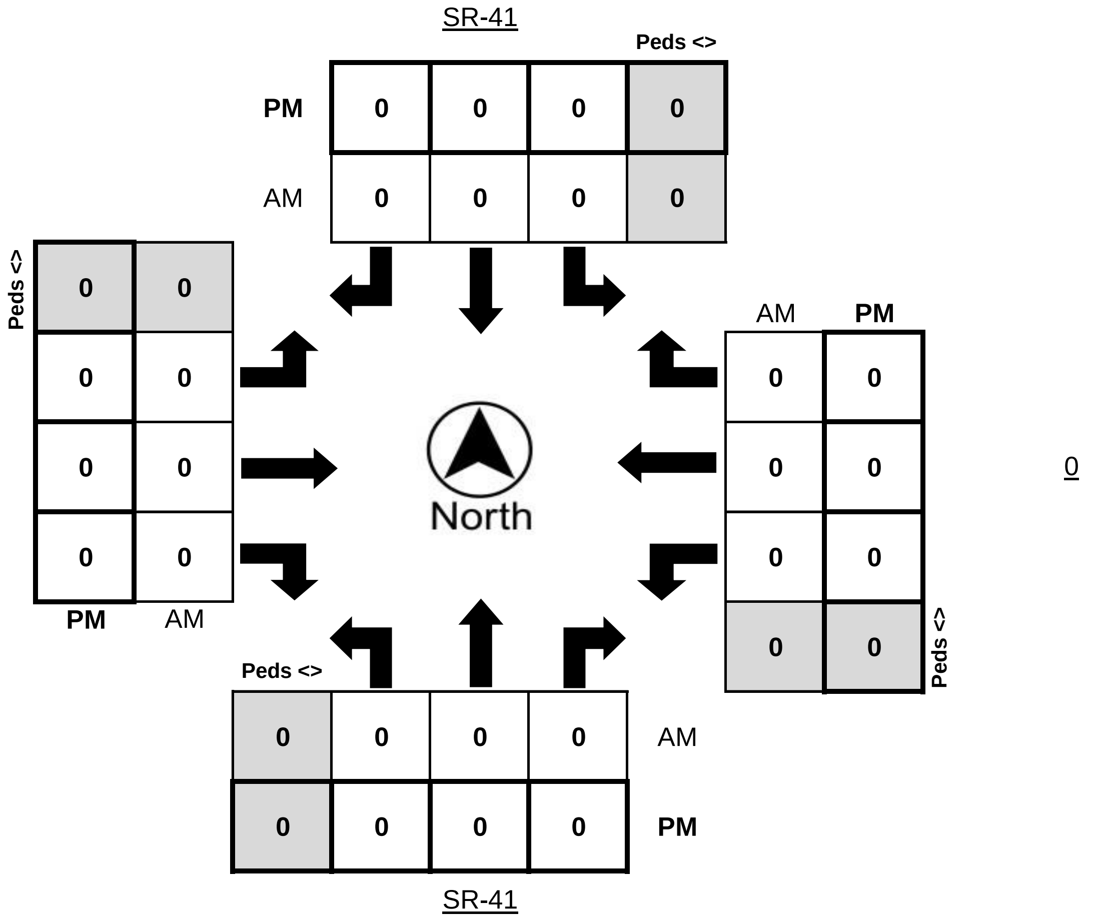
LOCATION Ave 14 @ SR-41
LATITUDE 36.9557
COUNTY Madera
LONGITUDE -119.7940
COLLECTION DATE Thursday, May 23, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 14 @ SR-41

N/S STREET SR-41 / SR-41

COUNTY Madera

E/W STREET / Ave 14

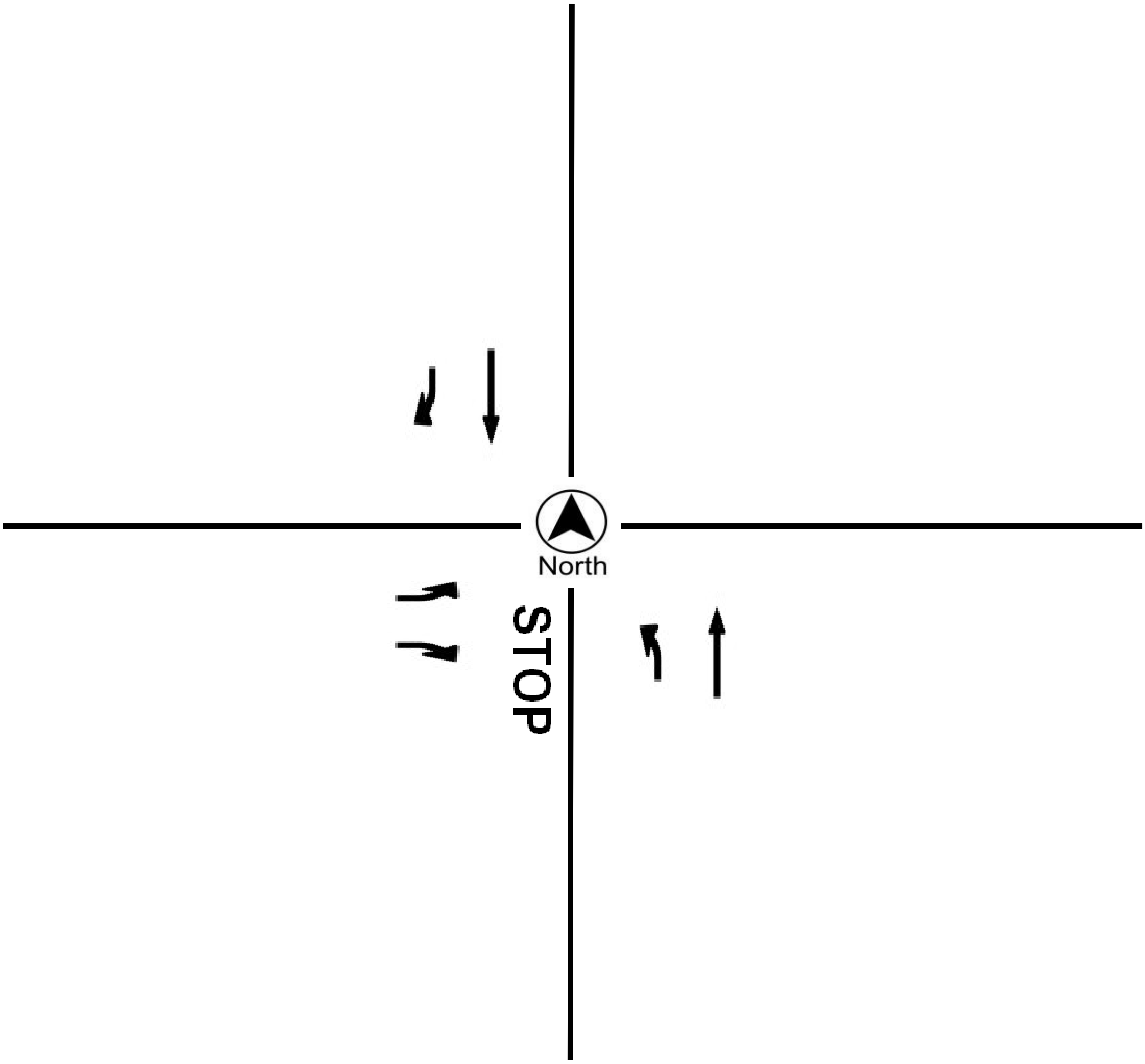
COLLECTION DATE Thursday, May 23, 2019

WEATHER Clear

CYCLE TIME N/A

CONTROL TYPE One-Way Stop

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 12 @ SR-41

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

LATITUDE 36.9232

LONGITUDE -119.7994

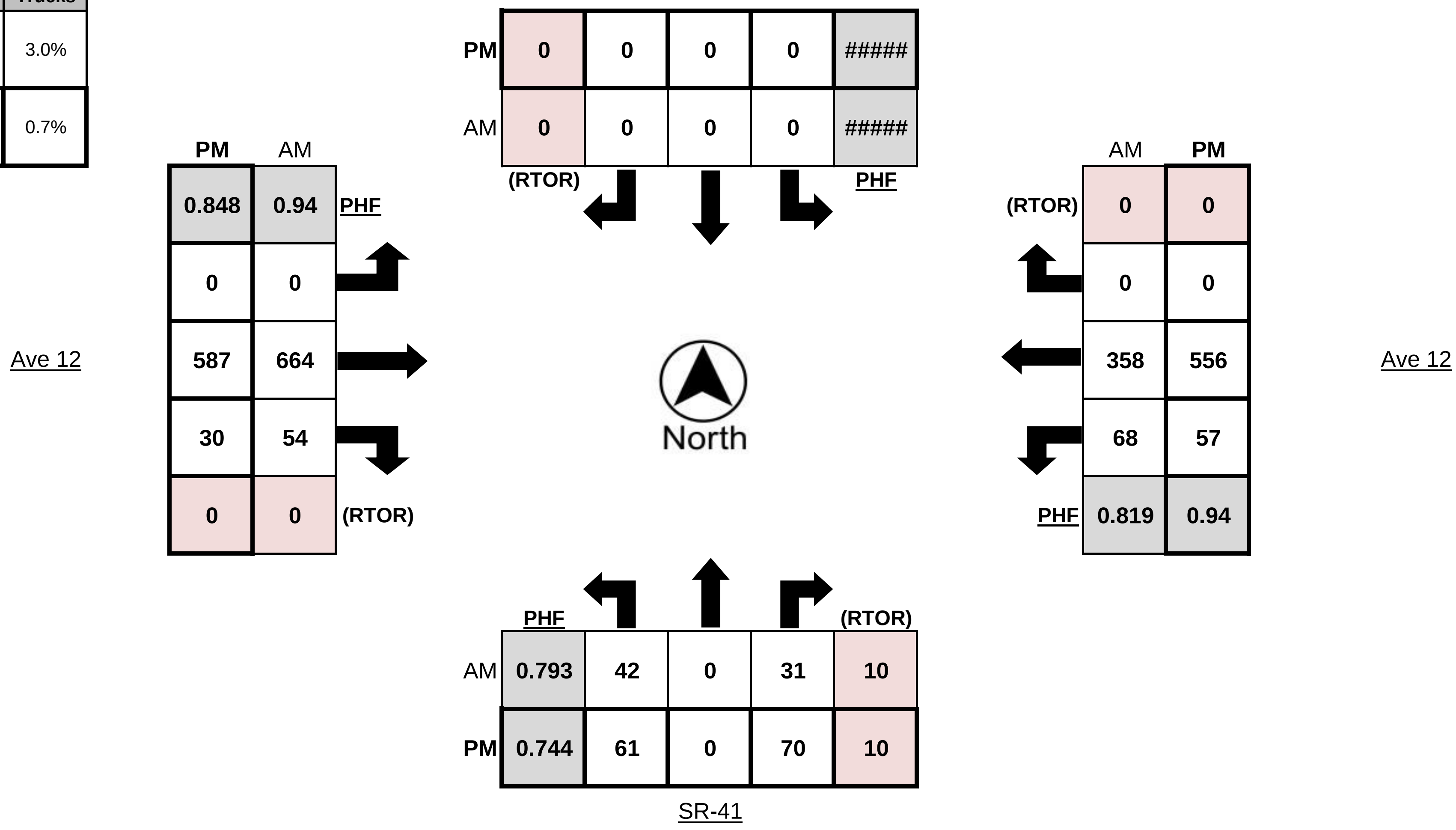
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	8	0	11	5	2	0	0	0	0	0	0	120	2	0	2	16	89	0	0	2
7:15 AM - 7:30 AM	9	0	7	2	1	0	0	0	0	0	0	182	9	0	2	6	108	0	0	3
7:30 AM - 7:45 AM	17	0	6	3	0	0	0	0	0	0	0	161	16	0	4	16	114	0	0	5
7:45 AM - 8:00 AM	10	0	8	2	0	0	0	0	0	0	0	158	14	0	4	17	68	0	0	6
8:00 AM - 8:15 AM	6	0	10	3	2	0	0	0	0	0	0	163	15	0	3	29	68	0	0	7
8:15 AM - 8:30 AM	6	0	7	2	0	0	0	0	0	0	0	141	6	0	5	17	80	0	0	4
8:30 AM - 8:45 AM	4	0	13	3	1	0	0	0	0	0	0	116	13	0	5	18	67	0	0	2
8:45 AM - 9:00 AM	5	0	6	0	0	0	0	0	0	0	0	110	6	0	4	20	63	0	0	8
TOTAL	**65**	**0**	**68**	**20**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**1151**	**81**	**0**	**29**	**139**	**657**	**0**	**0**	**37**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	18	0	14	3	0	0	0	0	0	0	0	129	14	0	2	24	146	0	0	2
4:15 PM - 4:30 PM	11	0	12	2	0	0	0	0	0	0	0	133	8	0	2	19	112	0	0	1
4:30 PM - 4:45 PM	11	0	20	3	1	0	0	0	0	0	0	133	8	0	1	22	124	0	0	0
4:45 PM - 5:00 PM	5	0	18	2	0	0	0	0	0	0	0	137	3	0	3	17	146	0	0	0
5:00 PM - 5:15 PM	22	0	22	3	0	0	0	0	0	0	0	124	6	0	1	15	146	0	0	1
5:15 PM - 5:30 PM	16	0	15	2	0	0	0	0	0	0	0	154	11	0	1	13	146	0	0	2
5:30 PM - 5:45 PM	18	0	15	3	0	0	0	0	0	0	0	172	10	0	1	12	118	0	0	0
5:45 PM - 6:00 PM	15	0	17	3	0	0	0	0	0	0	0	137	10	0	2	11	128	0	0	1
TOTAL	**116**	**0**	**133**	**21**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1119**	**70**	**0**	**13**	**133**	**1066**	**0**	**0**	**7**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	42	0	31	10	3	0	0	0	0	0	0	664	54	0	13	68	358	0	0	21
4:45 PM - 5:45 PM	61	0	70	10	0	0	0	0	0	0	0	587	30	0	6	57	556	0	0	3

	PHF	Trucks
AM	0.922	3.0%
PM	0.958	0.7%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

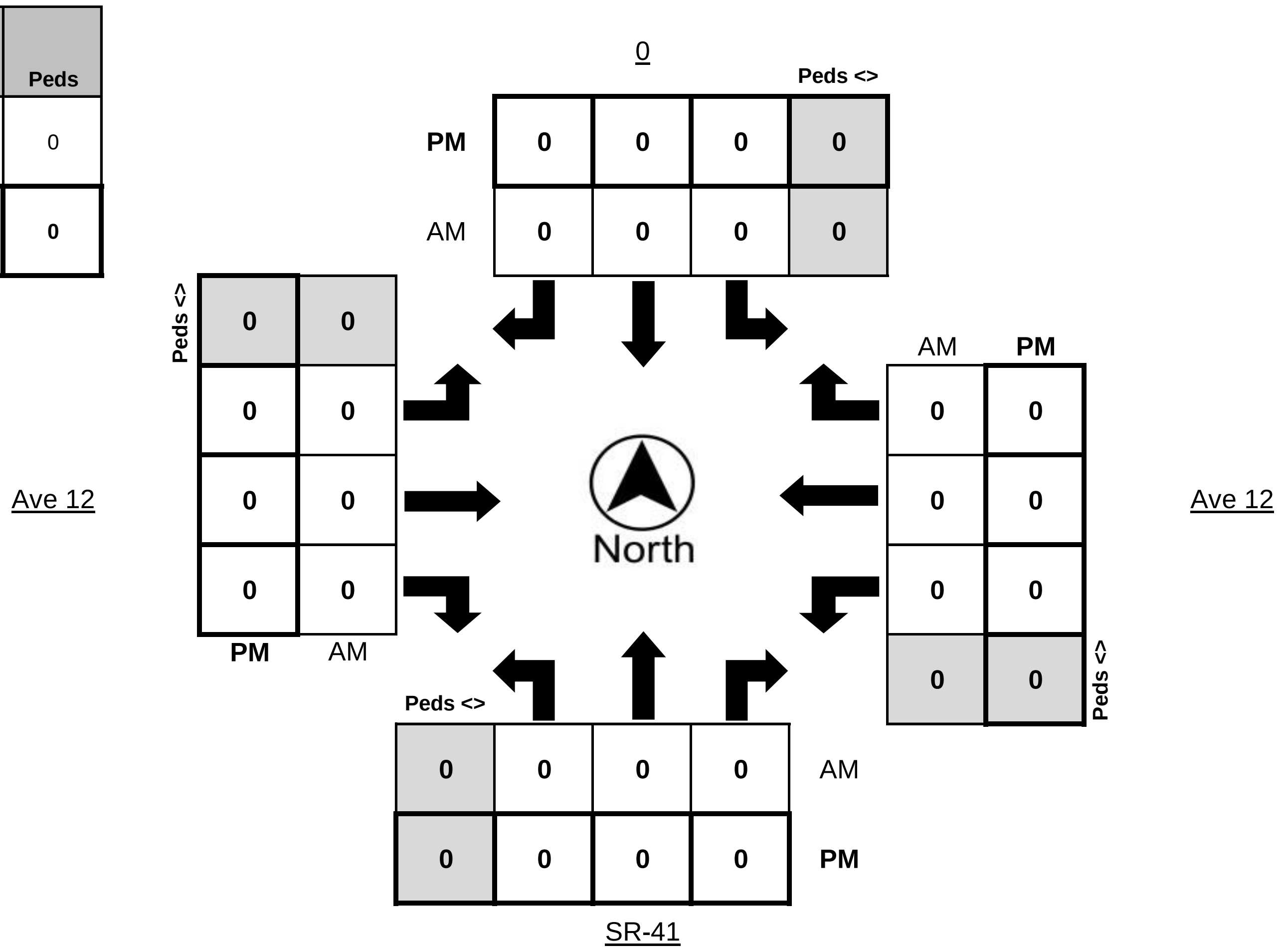
LOCATION Ave 12 @ SR-41
LATITUDE 36.9232
COUNTY Madera
LONGITUDE -119.7994
COLLECTION DATE Thursday, May 23, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 12 @ SR-41

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

CYCLE TIME N/A

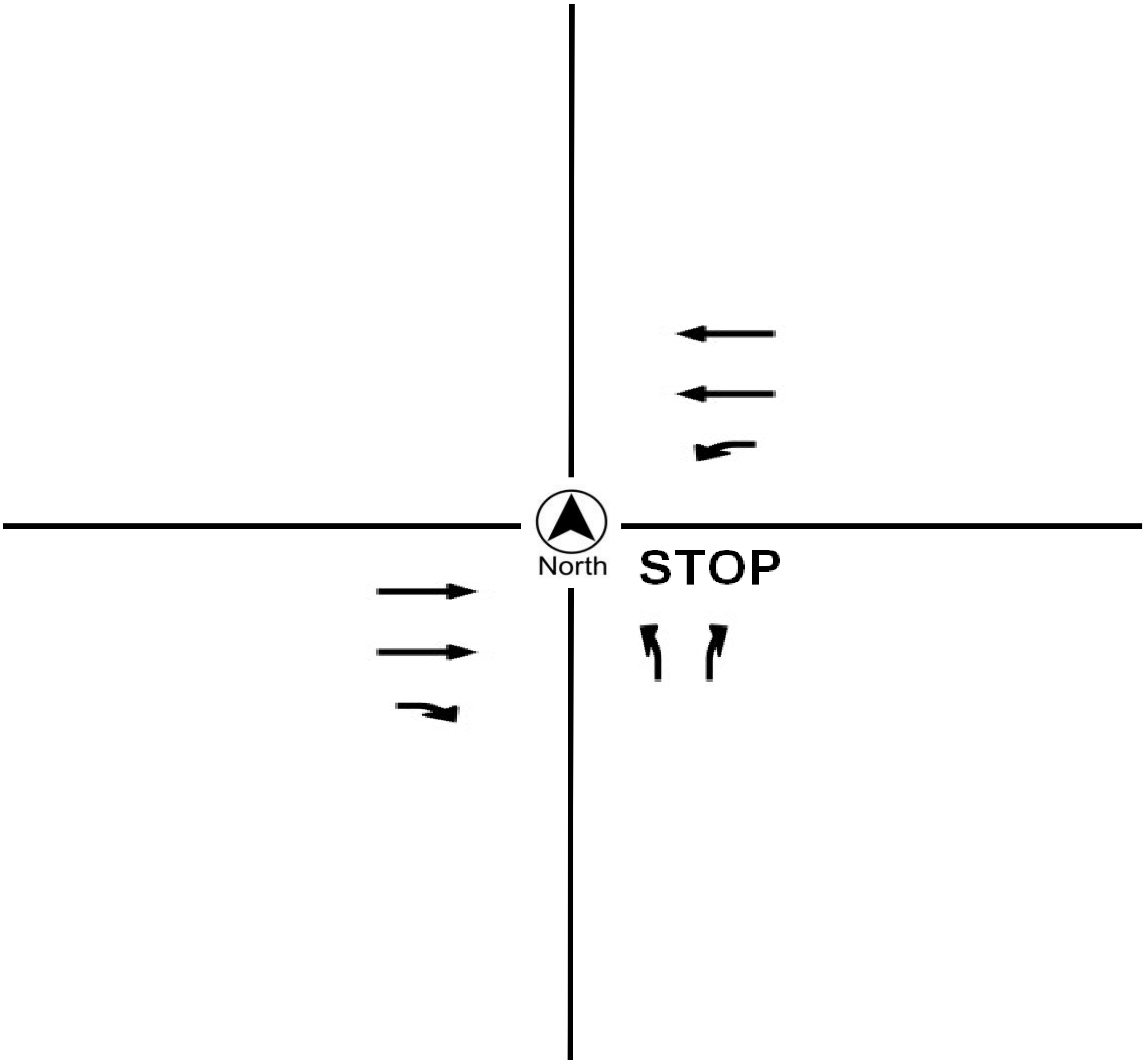
N/S STREET / SR-41

E/W STREET Ave 12 / Ave 12

WEATHER Clear

CONTROL TYPE One-Way Stop

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 12 @ SR-41B

COUNTY Madera

COLLECTION DATE Thursday, May 23, 2019

LATITUDE 36.9232

LONGITUDE -119.7940

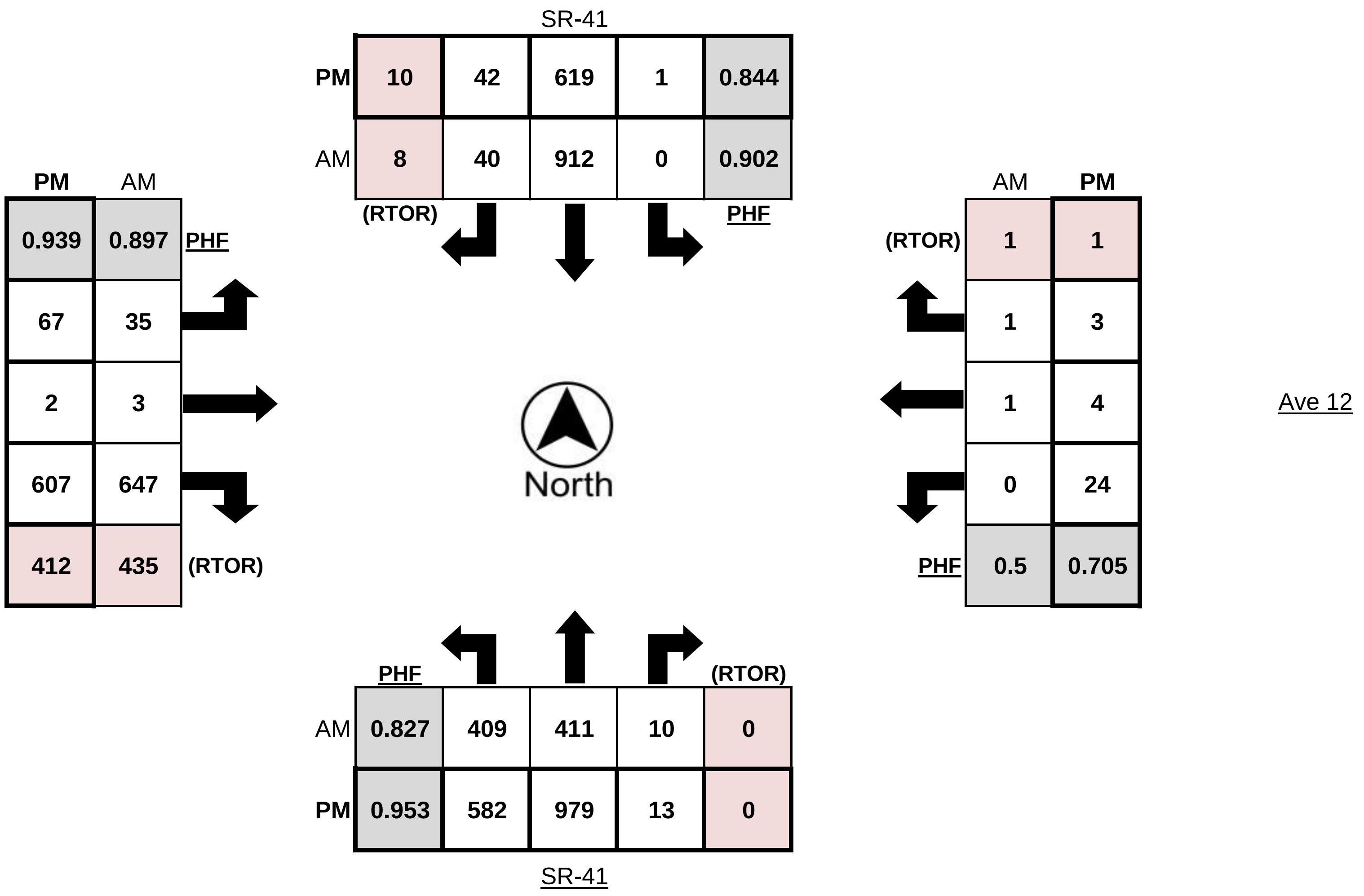
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	83	107	10	0	10	0	220	9	1	3	5	0	127	104	1	0	0	0	0	0
7:15 AM - 7:30 AM	125	108	6	0	6	0	194	4	0	1	7	1	183	129	1	0	0	1	1	0
7:30 AM - 7:45 AM	129	118	4	0	17	0	253	11	2	5	6	0	153	103	2	0	0	0	0	0
7:45 AM - 8:00 AM	78	89	0	0	11	0	224	9	2	7	12	2	163	115	3	0	0	0	0	0
8:00 AM - 8:15 AM	77	96	0	0	16	0	241	16	4	6	10	0	148	88	5	0	1	0	0	1
8:15 AM - 8:30 AM	95	136	3	0	16	0	213	12	2	1	9	0	154	122	4	3	0	0	0	0
8:30 AM - 8:45 AM	77	88	1	0	9	0	208	11	1	2	7	0	123	89	6	3	1	1	0	0
8:45 AM - 9:00 AM	79	93	3	0	20	0	211	13	2	5	10	0	115	60	4	0	0	1	1	0
TOTAL	**743**	**835**	**27**	**0**	**105**	**0**	**1764**	**85**	**14**	**30**	**66**	**3**	**1166**	**810**	**26**	**6**	**2**	**3**	**2**	**1**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	133	223	2	0	3	0	138	12	3	8	18	1	138	94	2	3	5	0	0	0
4:15 PM - 4:30 PM	124	264	2	0	3	1	166	11	3	5	14	0	132	108	3	3	0	1	0	0
4:30 PM - 4:45 PM	140	233	2	0	1	0	139	10	4	3	18	0	126	89	2	8	0	2	1	0
4:45 PM - 5:00 PM	168	243	2	0	2	1	179	9	1	6	14	0	152	118	2	5	2	1	0	1
5:00 PM - 5:15 PM	160	240	2	0	3	0	119	13	2	4	21	1	130	93	3	9	0	1	0	0
5:15 PM - 5:30 PM	125	249	3	0	4	0	132	13	4	2	18	0	160	99	2	1	1	0	0	0
5:30 PM - 5:45 PM	129	247	6	0	2	0	189	7	3	1	14	1	165	102	0	9	1	1	1	0
5:45 PM - 6:00 PM	143	239	2	0	1	0	136	4	1	1	14	1	141	94	2	0	0	2	0	0
TOTAL	**1122**	**1938**	**21**	**0**	**19**	**2**	**1198**	**79**	**21**	**30**	**131**	**4**	**1144**	**797**	**16**	**38**	**9**	**8**	**2**	**1**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	409	411	10	0	50	0	912	40	8	19	35	3	647	435	11	0	1	1	1	1
4:45 PM - 5:45 PM	582	979	13	0	11	1	619	42	10	13	67	2	607	412	7	24	4	3	1	1

	PHF	Trucks
AM	0.916	3.3%
PM	0.948	1.1%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 12 @ SR-41B

LATITUDE 36.9232

COUNTY Madera

LONGITUDE -119.7940

COLLECTION DATE Thursday, May 23, 2019

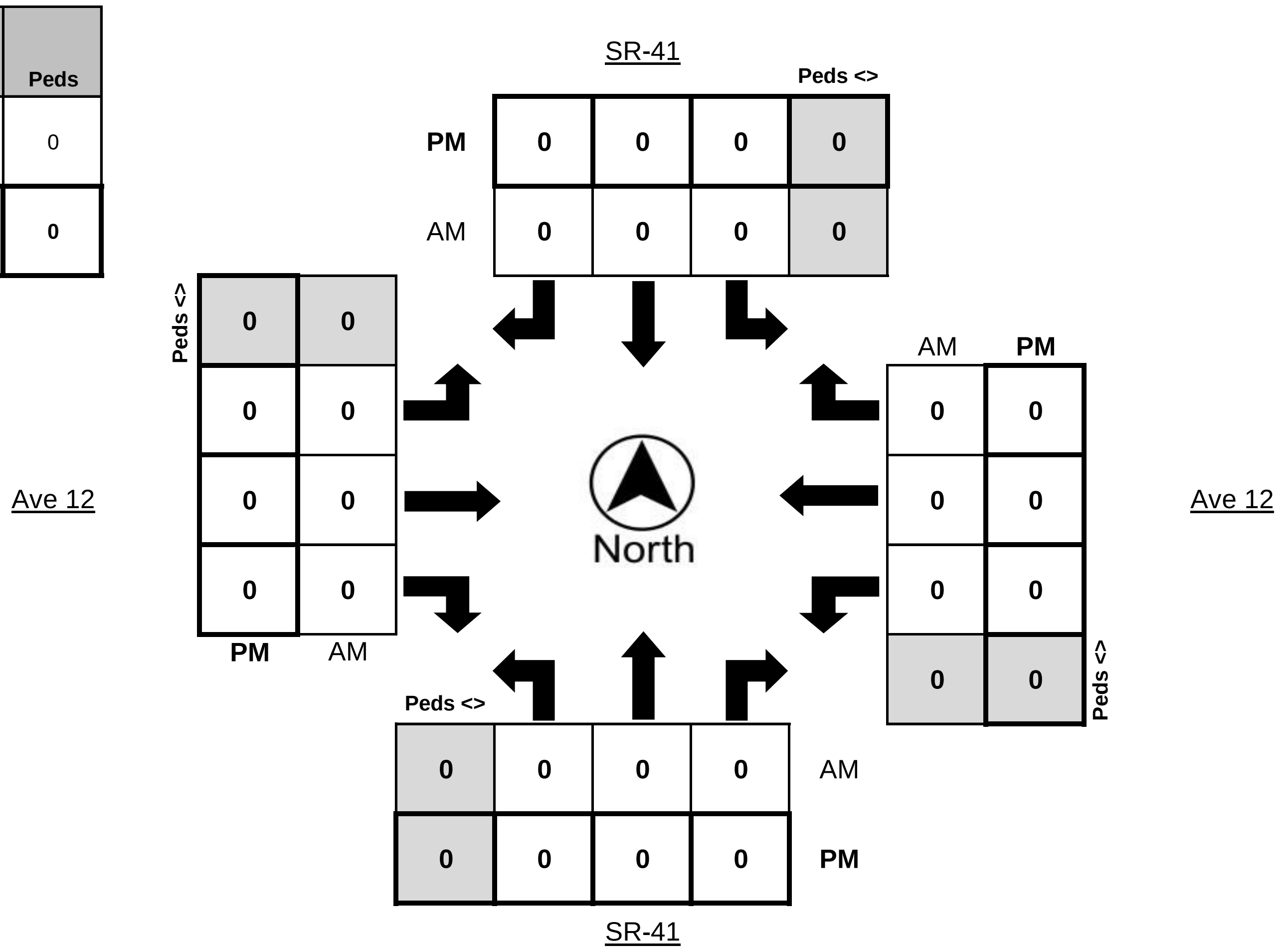
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 12 @ SR-41B

N/S STREET SR-41 / SR-41

COUNTY Madera

E/W STREET Ave 12 / Ave 12

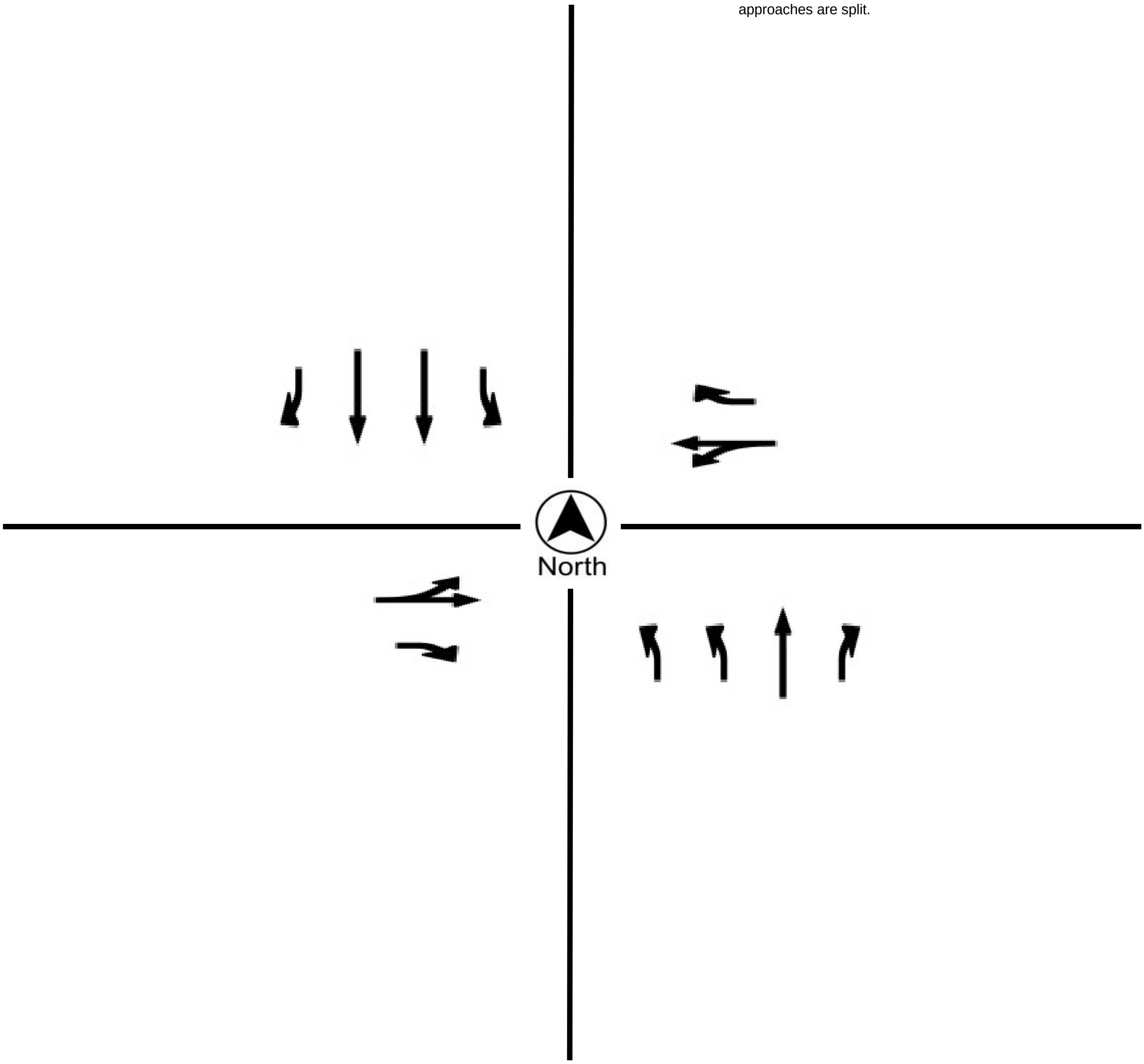
COLLECTION DATE Thursday, May 23, 2019

WEATHER Clear

CYCLE TIME 225 Seconds

CONTROL TYPE Signal

COMMENTS Northbound and southbound approaches have protected left turns. Eastbound and westbound approaches are split.



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ Lanes Bridge Dr

COUNTY Madera

COLLECTION DATE Wednesday, May 22, 2019

LATITUDE 36.8920

LONGITUDE -119.7959

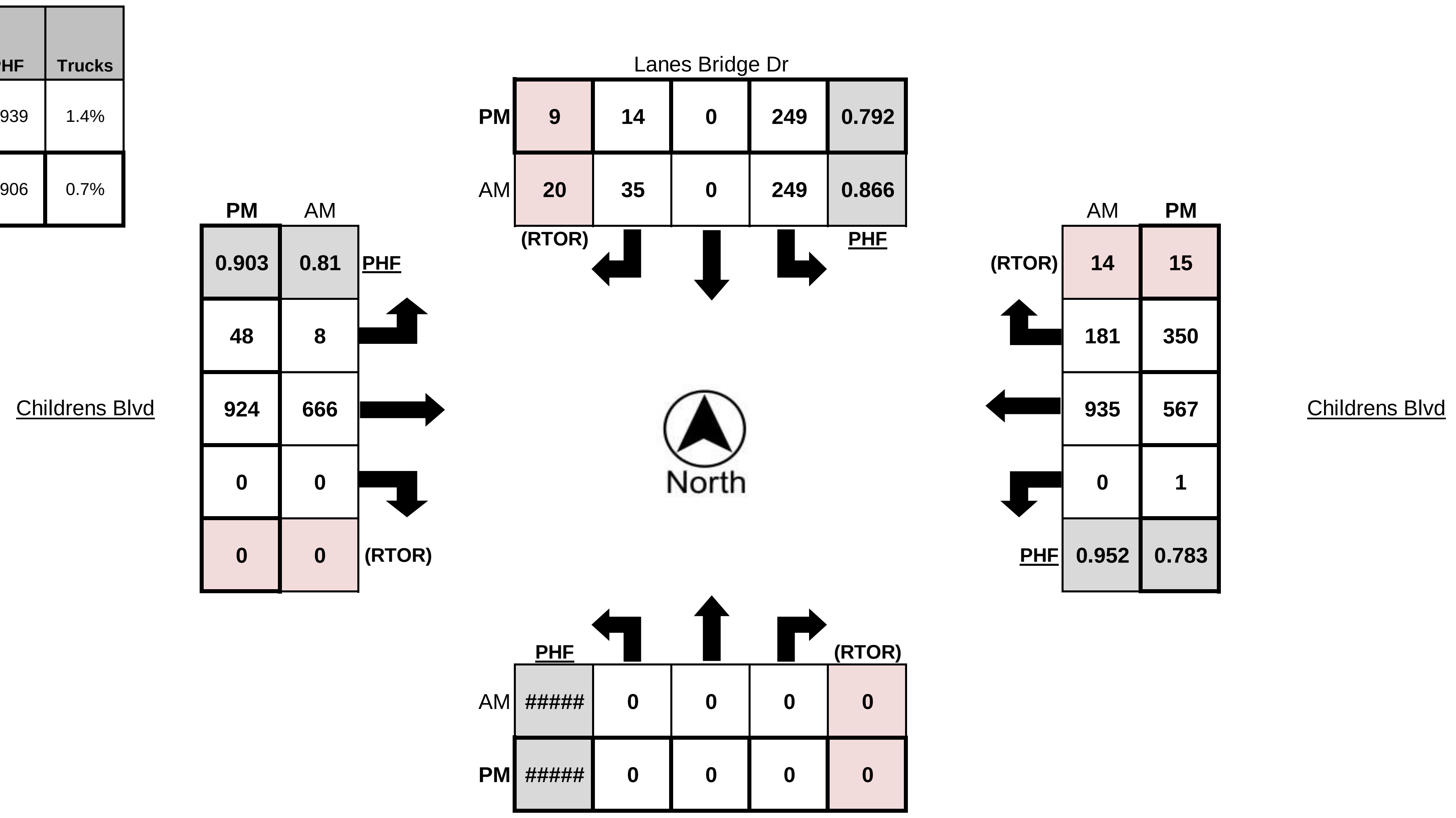
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	0	36	0	3	2	0	4	87	0	0	2	0	208	28	0	3
7:15 AM - 7:30 AM	0	0	0	0	0	75	0	6	4	2	2	116	0	0	2	0	202	36	6	7
7:30 AM - 7:45 AM	0	0	0	0	0	73	0	9	5	1	3	205	0	0	3	0	222	35	2	7
7:45 AM - 8:00 AM	0	0	0	0	0	65	0	14	10	0	2	187	0	0	0	0	224	60	1	2
8:00 AM - 8:15 AM	0	0	0	0	0	69	0	9	4	3	1	149	0	0	1	0	249	44	5	7
8:15 AM - 8:30 AM	0	0	0	0	0	42	0	3	1	1	2	125	0	0	4	0	240	42	6	1
8:30 AM - 8:45 AM	0	0	0	0	0	50	0	7	4	1	4	103	0	0	2	0	199	37	0	1
8:45 AM - 9:00 AM	0	0	0	0	0	34	0	2	1	2	2	105	0	0	2	0	146	45	0	3
TOTAL	**0**	**0**	**0**	**0**	**0**	**444**	**0**	**53**	**31**	**10**	**20**	**1077**	**0**	**0**	**16**	**0**	**1690**	**327**	**20**	**31**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	0	0	0	0	0	90	0	9	6	2	7	230	0	0	2	0	128	58	5	6
4:15 PM - 4:30 PM	0	0	0	0	0	46	0	2	1	1	7	201	0	0	0	4	114	70	0	3
4:30 PM - 4:45 PM	0	0	0	0	0	59	0	4	3	0	8	261	0	0	0	0	112	69	7	2
4:45 PM - 5:00 PM	0	0	0	0	0	45	0	3	2	1	14	214	0	0	1	1	122	76	2	2
5:00 PM - 5:15 PM	0	0	0	0	0	79	0	4	2	3	10	256	0	0	0	0	152	93	0	2
5:15 PM - 5:30 PM	0	0	0	0	0	66	0	3	2	1	16	193	0	0	0	0	181	112	6	3
5:30 PM - 5:45 PM	0	0	0	0	0	63	0	5	4	0	11	171	0	0	1	0	140	83	7	1
5:45 PM - 6:00 PM	0	0	0	0	0	41	0	6	2	1	4	153	0	0	1	2	116	86	5	1
TOTAL	**0**	**0**	**0**	**0**	**0**	**489**	**0**	**36**	**22**	**9**	**77**	**1679**	**0**	**0**	**5**	**7**	**1065**	**647**	**32**	**20**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	0	0	0	0	0	249	0	35	20	5	8	666	0	0	8	0	935	181	14	17
4:30 PM - 5:30 PM	0	0	0	0	0	249	0	14	9	5	48	924	0	0	1	1	567	350	15	9

	PHF	**Trucks**
AM	0.939	1.4%
PM	0.906	0.7%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ Lanes Bridge Dr

LATITUDE 36.8920

COUNTY Madera

LONGITUDE -119.7959

COLLECTION DATE Wednesday, May 22, 2019

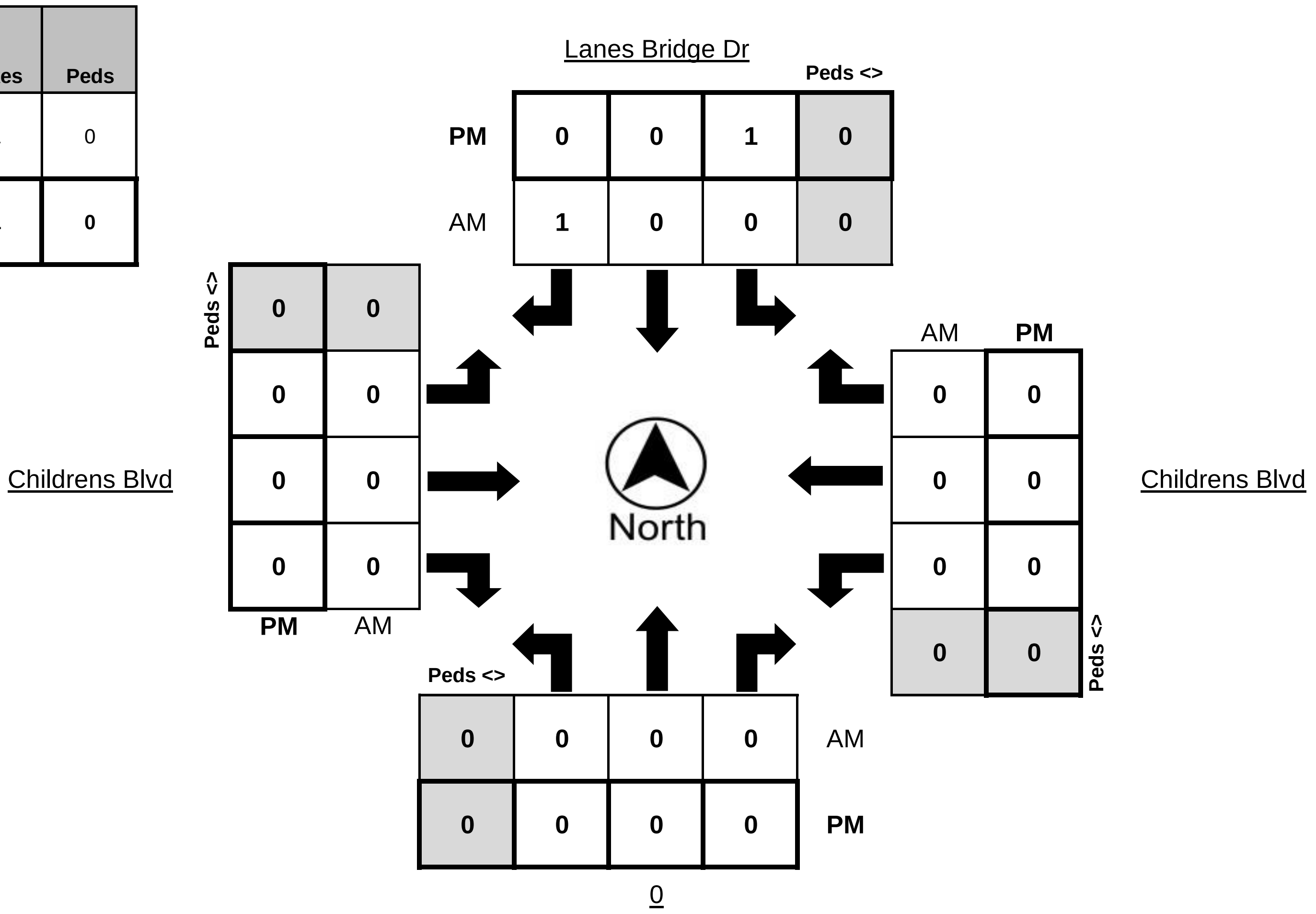
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
TOTAL	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM - 5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	1	0
PM Peak Total	1	0



Turning Movement Report

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ Lanes Bridge Dr

N/S STREET Lanes Bridge Dr /

COUNTY Madera

E/W STREET Childrens Blvd / Childrens Blvd

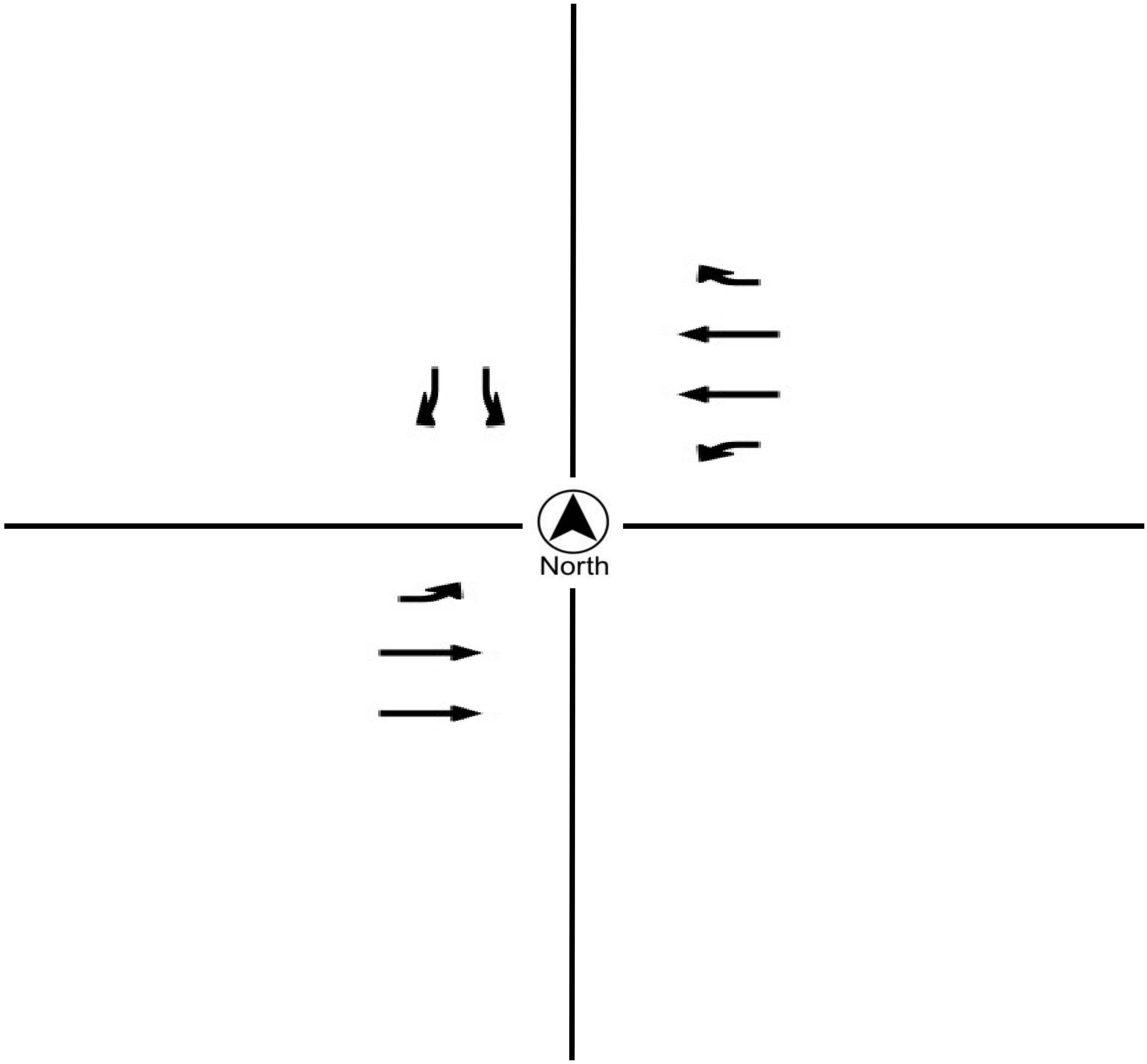
COLLECTION DATE Wednesday, May 22, 2019

WEATHER Clear

CYCLE TIME 43 Seconds

CONTROL TYPE Signal

COMMENTS Eastbound/westbound left turns are protected.



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ SR-41 SB Ramps

COUNTY Madera

COLLECTION DATE Wednesday, May 22, 2019

LATITUDE 36.8929

LONGITUDE -119.7941

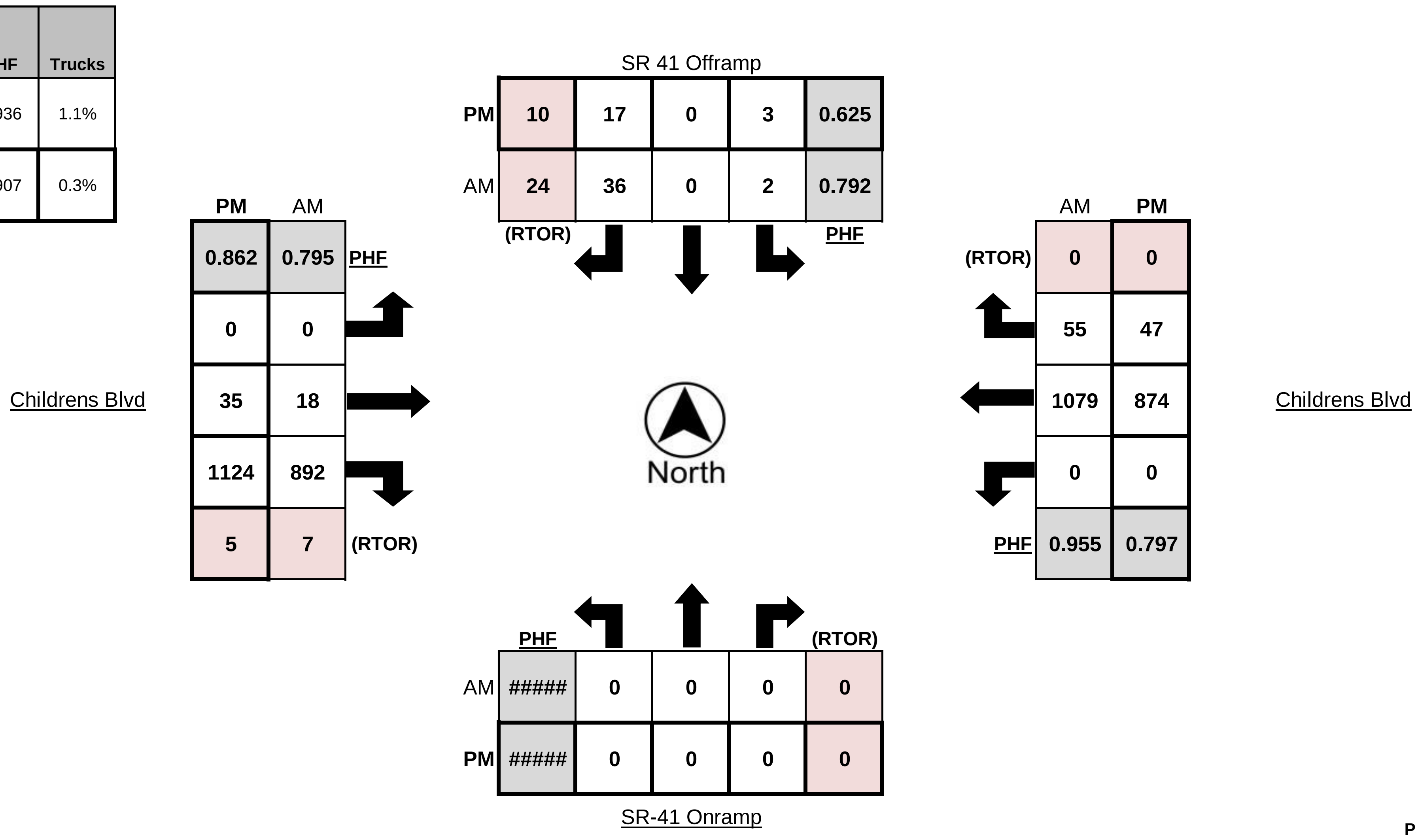
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	8	8	0	0	3	119	0	2	0	213	5	0	2
7:15 AM - 7:30 AM	0	0	0	0	0	2	0	7	7	0	0	4	181	6	2	0	232	8	0	3
7:30 AM - 7:45 AM	0	0	0	0	0	1	0	8	7	0	0	5	281	2	5	0	248	13	0	4
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	8	5	1	0	1	244	3	0	0	274	12	0	1
8:00 AM - 8:15 AM	0	0	0	0	0	1	0	8	4	1	0	8	205	0	1	0	279	11	0	4
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	12	8	0	0	4	162	2	3	0	278	19	0	3
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	7	2	0	0	4	149	0	3	0	224	11	0	2
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	8	5	0	0	5	129	0	2	0	176	13	0	2
TOTAL	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**66**	**46**	**2**	**0**	**34**	**1470**	**13**	**18**	**0**	**1924**	**92**	**0**	**21**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	4	1	0	0	14	296	3	2	0	174	12	0	3
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	7	4	1	0	12	253	0	3	0	184	10	0	3
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	4	3	0	0	10	301	0	0	0	177	11	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	5	3	0	0	10	247	0	2	0	186	18	0	3
5:00 PM - 5:15 PM	0	0	0	0	0	1	0	2	2	0	0	7	329	2	0	0	235	5	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	2	0	6	2	0	0	8	247	3	1	0	276	13	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	3	3	0	0	9	231	0	0	0	226	9	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	1	0	1	0	0	0	9	193	0	1	0	197	20	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**32**	**18**	**1**	**0**	**79**	**2097**	**8**	**9**	**0**	**1655**	**98**	**0**	**9**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:30 AM - 8:30 AM	0	0	0	0	0	2	0	36	24	2	0	18	892	7	9	0	1079	55	0	12
4:30 PM - 5:30 PM	0	0	0	0	0	3	0	17	10	0	0	35	1124	5	3	0	874	47	0	3

	PHF	Trucks
AM	0.936	1.1%
PM	0.907	0.3%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ SR-41 SB Ramps

LATITUDE 36.8929

COUNTY Madera

LONGITUDE -119.7941

COLLECTION DATE Wednesday, May 22, 2019

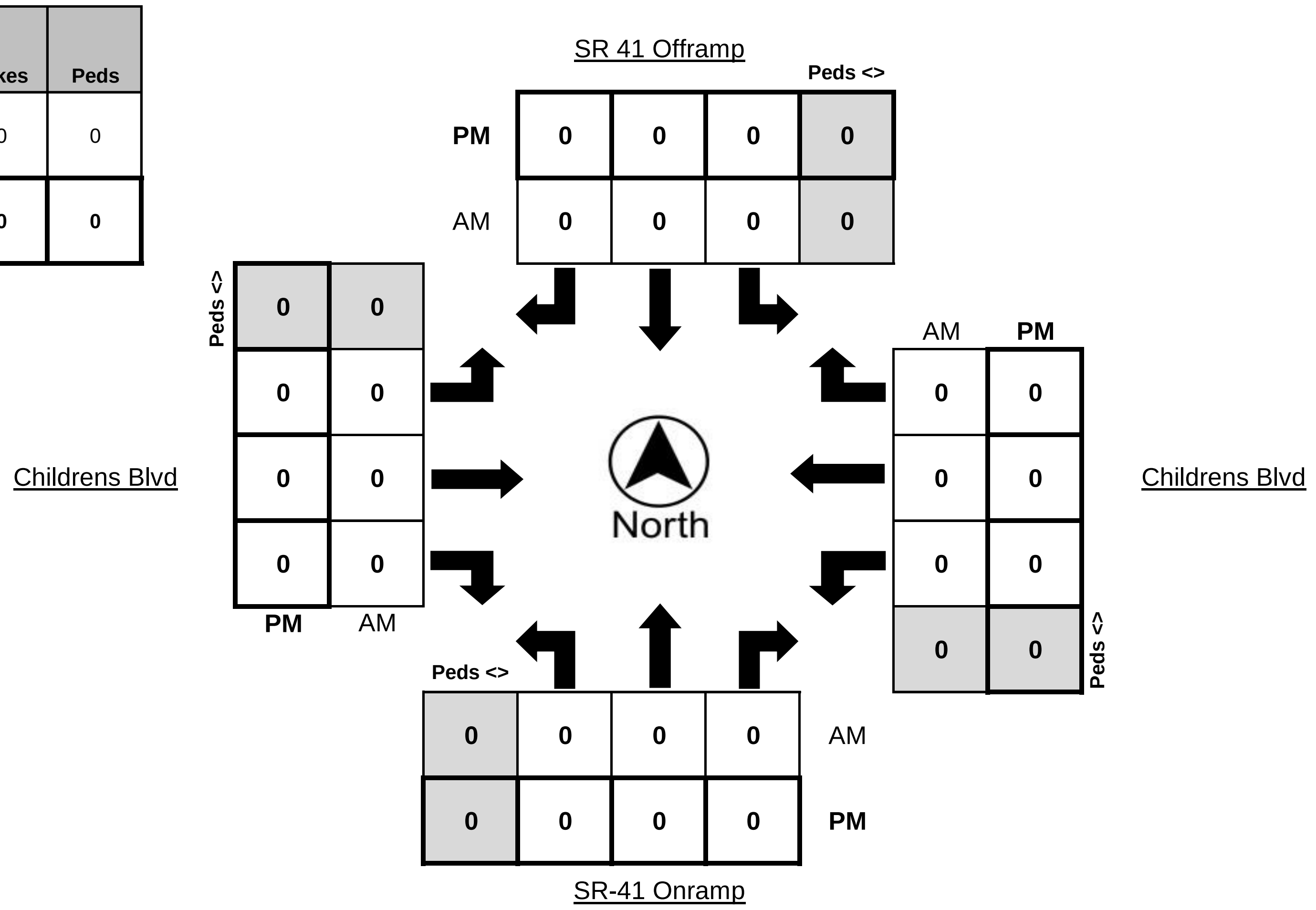
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ SR-41 SB Ramps

N/S STREET SR 41 Offramp / SR-41 Onramp

COUNTY Madera

E/W STREET Childrens Blvd / Childrens Blvd

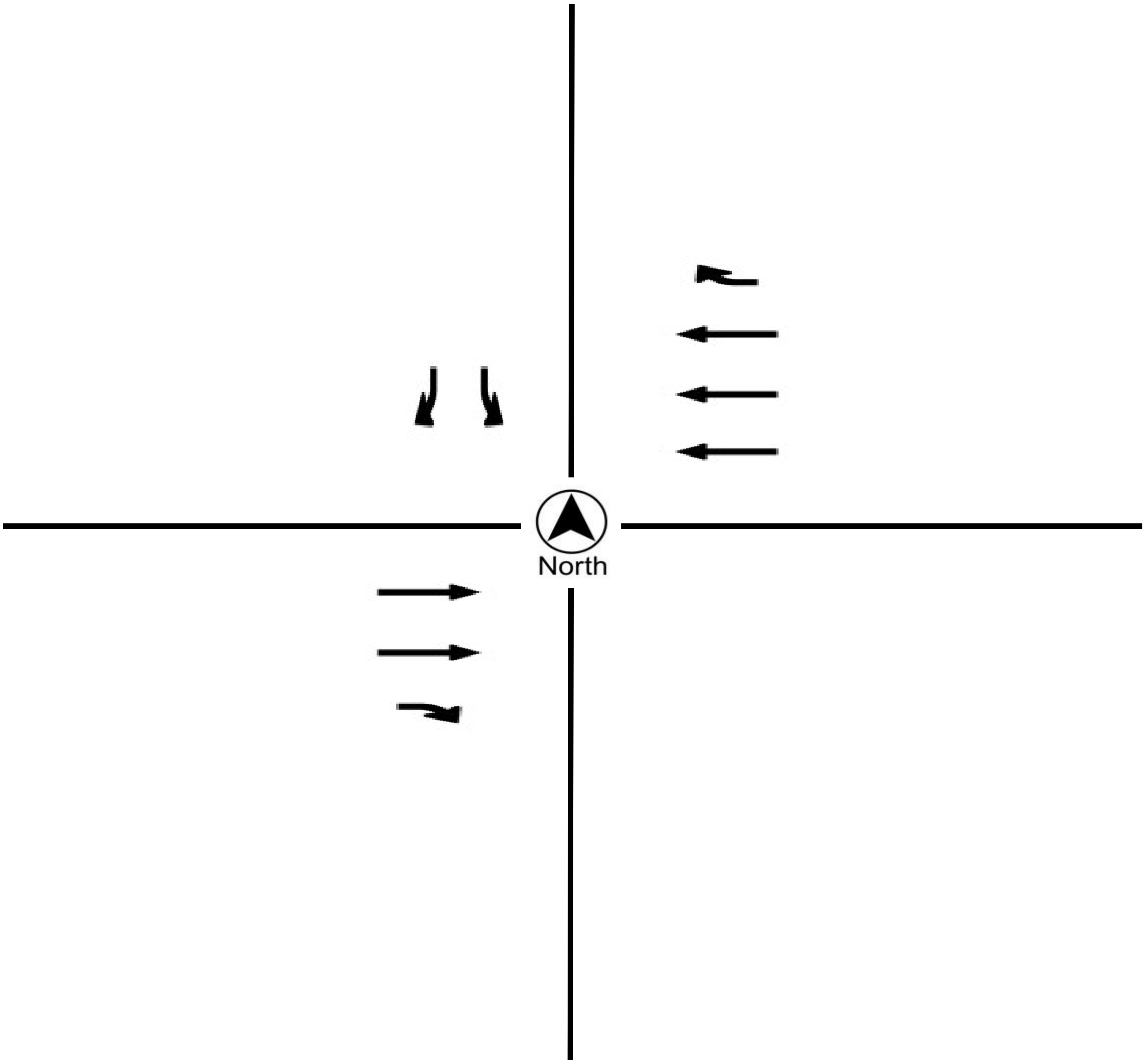
COLLECTION DATE Wednesday, May 22, 2019

WEATHER Clear

CYCLE TIME 357 Seconds

CONTROL TYPE Signal

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ SR-41 NB Ramps
COUNTY Madera
COLLECTION DATE Wednesday, May 22, 2019

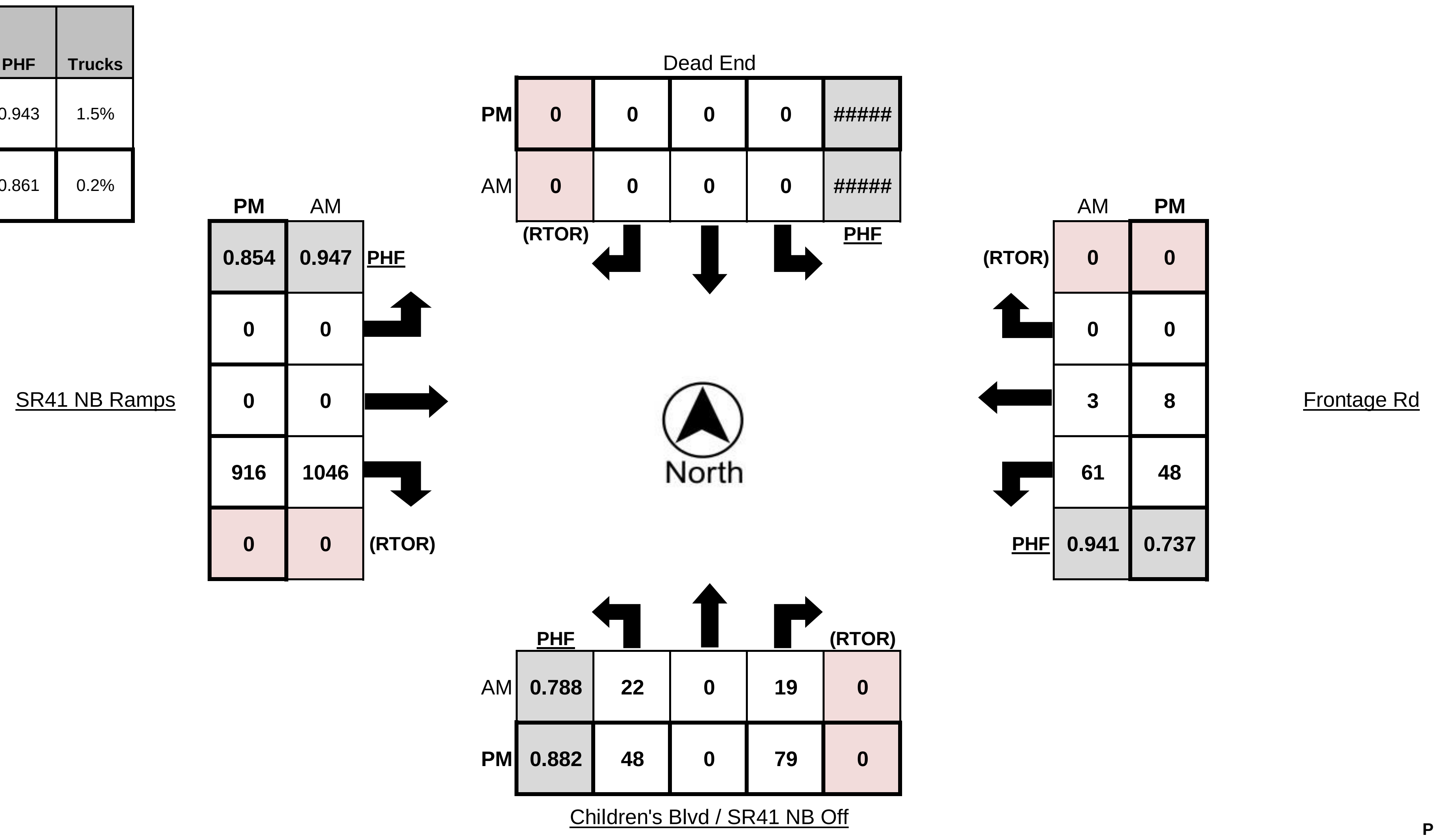
LATITUDE 36.8965
LONGITUDE -119.7908
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	3	0	3	0	0	0	0	0	0	0	0	0	225	0	2	6	2	0	0	0
7:15 AM - 7:30 AM	7	0	6	0	1	0	0	0	0	0	0	0	235	0	3	8	1	0	0	0
7:30 AM - 7:45 AM	7	0	6	0	2	0	0	0	0	0	0	0	240	0	3	15	2	0	0	0
7:45 AM - 8:00 AM	2	0	2	0	0	0	0	0	0	0	0	0	265	0	2	16	0	0	0	1
8:00 AM - 8:15 AM	8	0	4	0	1	0	0	0	0	0	0	0	265	0	5	14	0	0	0	0
8:15 AM - 8:30 AM	5	0	7	0	0	0	0	0	0	0	0	0	276	0	3	16	1	0	0	0
8:30 AM - 8:45 AM	5	0	9	0	1	0	0	0	0	0	0	0	213	0	1	11	0	0	0	1
8:45 AM - 9:00 AM	6	0	11	0	0	0	0	0	0	0	0	0	168	0	2	12	0	0	0	0
TOTAL	**43**	**0**	**48**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1887**	**0**	**21**	**98**	**6**	**0**	**0**	**2**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	11	0	22	0	1	0	0	0	0	0	0	0	174	0	3	13	0	0	0	0
4:15 PM - 4:30 PM	13	0	19	0	0	0	0	0	0	0	0	0	173	0	3	13	1	0	0	0
4:30 PM - 4:45 PM	12	0	25	0	0	0	0	0	0	0	0	0	181	0	0	13	1	0	0	0
4:45 PM - 5:00 PM	7	0	18	0	0	0	0	0	0	0	0	0	187	0	3	16	0	0	0	0
5:00 PM - 5:15 PM	11	0	11	0	0	0	0	0	0	0	0	0	228	0	0	8	4	0	0	0
5:15 PM - 5:30 PM	16	0	19	0	0	0	0	0	0	0	0	0	268	0	0	14	2	0	0	0
5:30 PM - 5:45 PM	8	0	26	0	0	0	0	0	0	0	0	0	226	0	1	9	0	0	0	0
5:45 PM - 6:00 PM	13	0	23	0	0	0	0	0	0	0	0	0	194	0	1	17	2	0	0	0
TOTAL	**91**	**0**	**163**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1631**	**0**	**11**	**103**	**10**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:30 AM - 8:30 AM	22	0	19	0	3	0	0	0	0	0	0	0	1046	0	13	61	3	0	0	1
5:00 PM - 6:00 PM	48	0	79	0	0	0	0	0	0	0	0	0	916	0	2	48	8	0	0	0

	PHF	Trucks
AM	0.943	1.5%
PM	0.861	0.2%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Children's Blvd @ SR-41 NB Ramps

LATITUDE 36.8965

COUNTY Madera

LONGITUDE -119.7908

COLLECTION DATE Wednesday, May 22, 2019

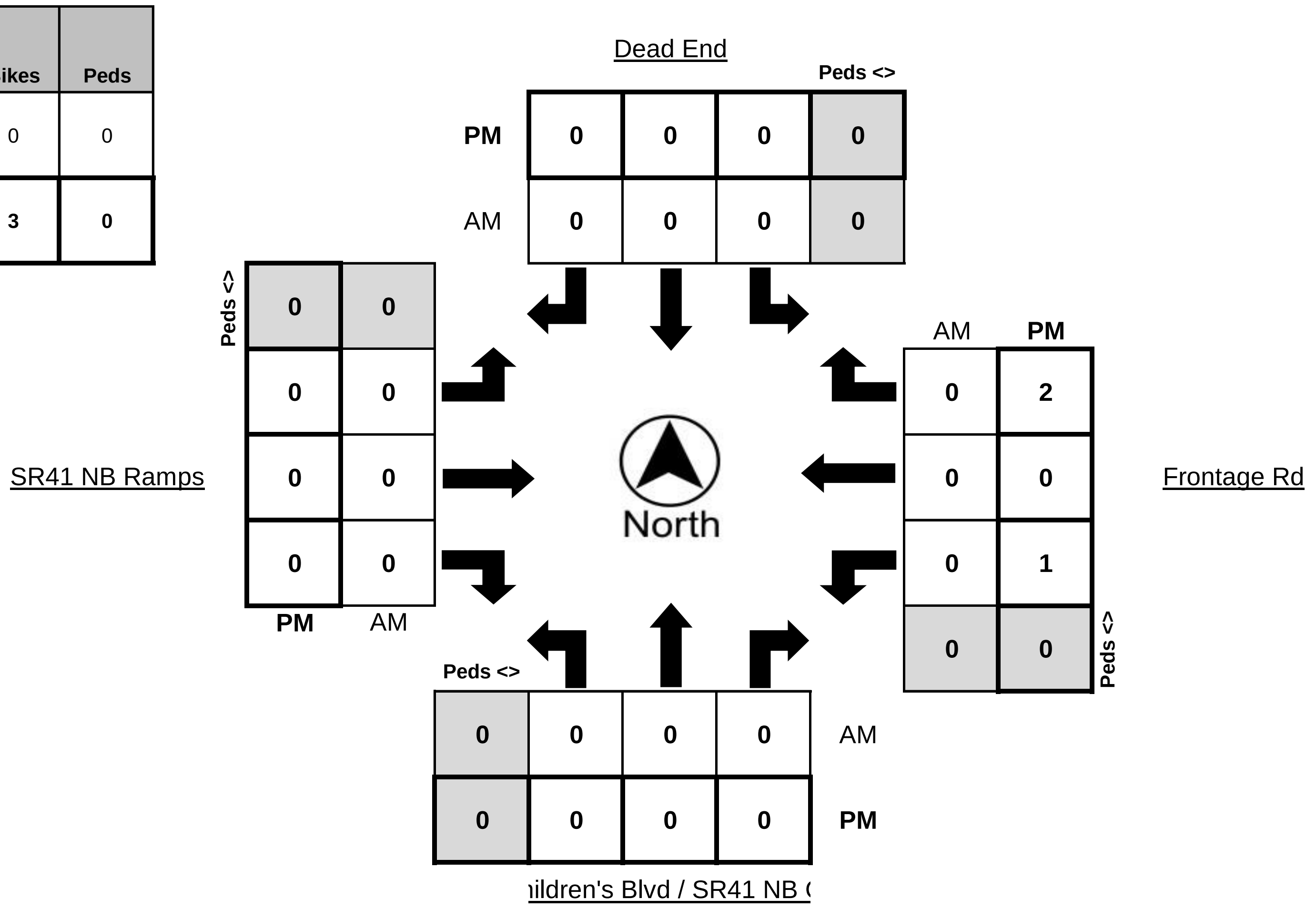
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0

	Bikes	**Peds**
AM Peak Total	0	0
PM Peak Total	**3**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

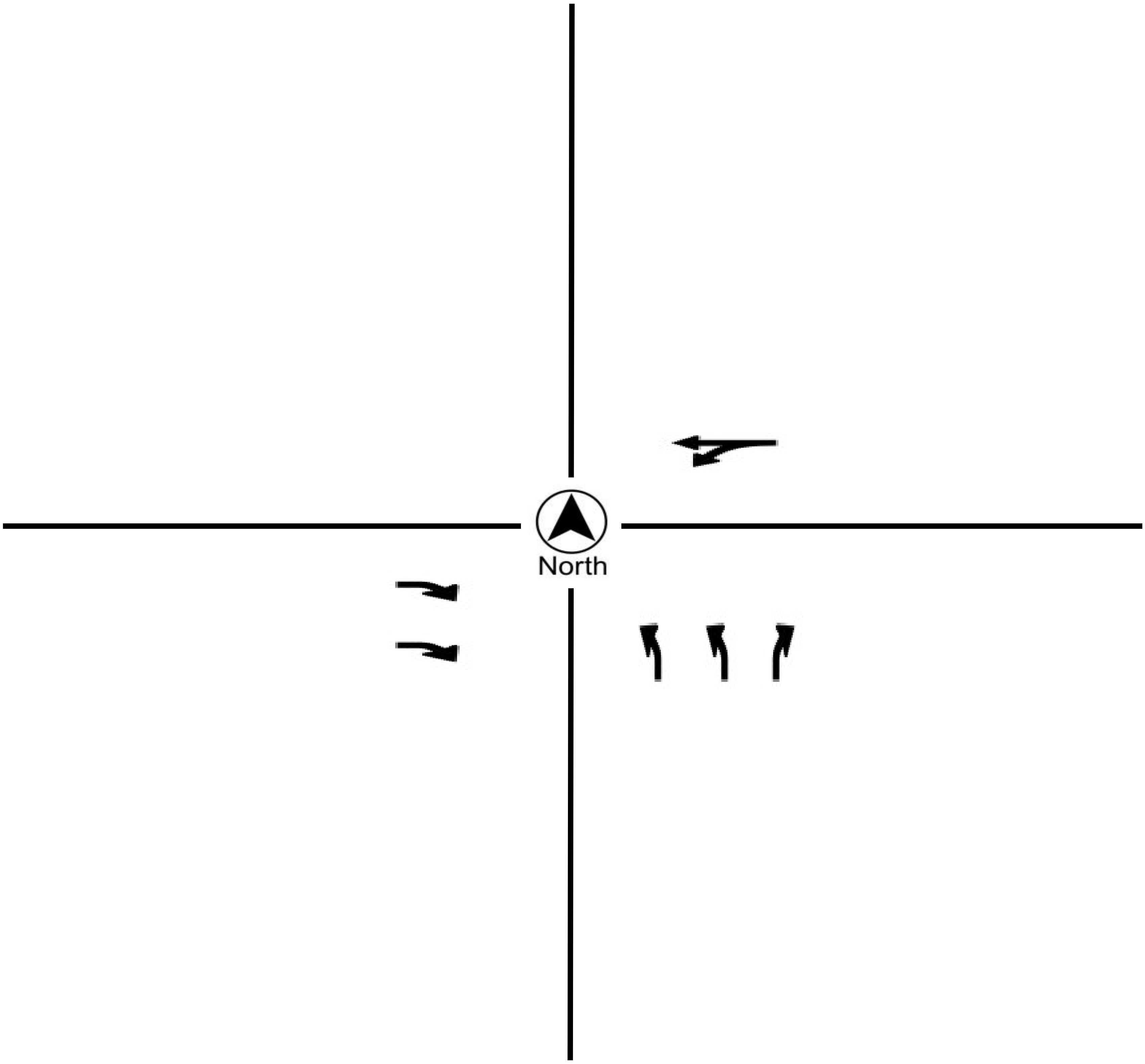
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION	Children's Blvd @ SR-41 NB Ramps	**N/S STREET**	Children's Blvd
COUNTY	Madera	**E/W STREET**	SR41 NB Ramps / Frontage Rd
COLLECTION DATE	Wednesday, May 22, 2019	**WEATHER**	Clear
CYCLE TIME	69 Seconds	**CONTROL TYPE**	Signal

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION SR-41 Mainline south of Ave 12

COUNTY Madera

COLLECTION DATE Wednesday, May 22, 2019

LATITUDE 36.9027

LONGITUDE -119.7924

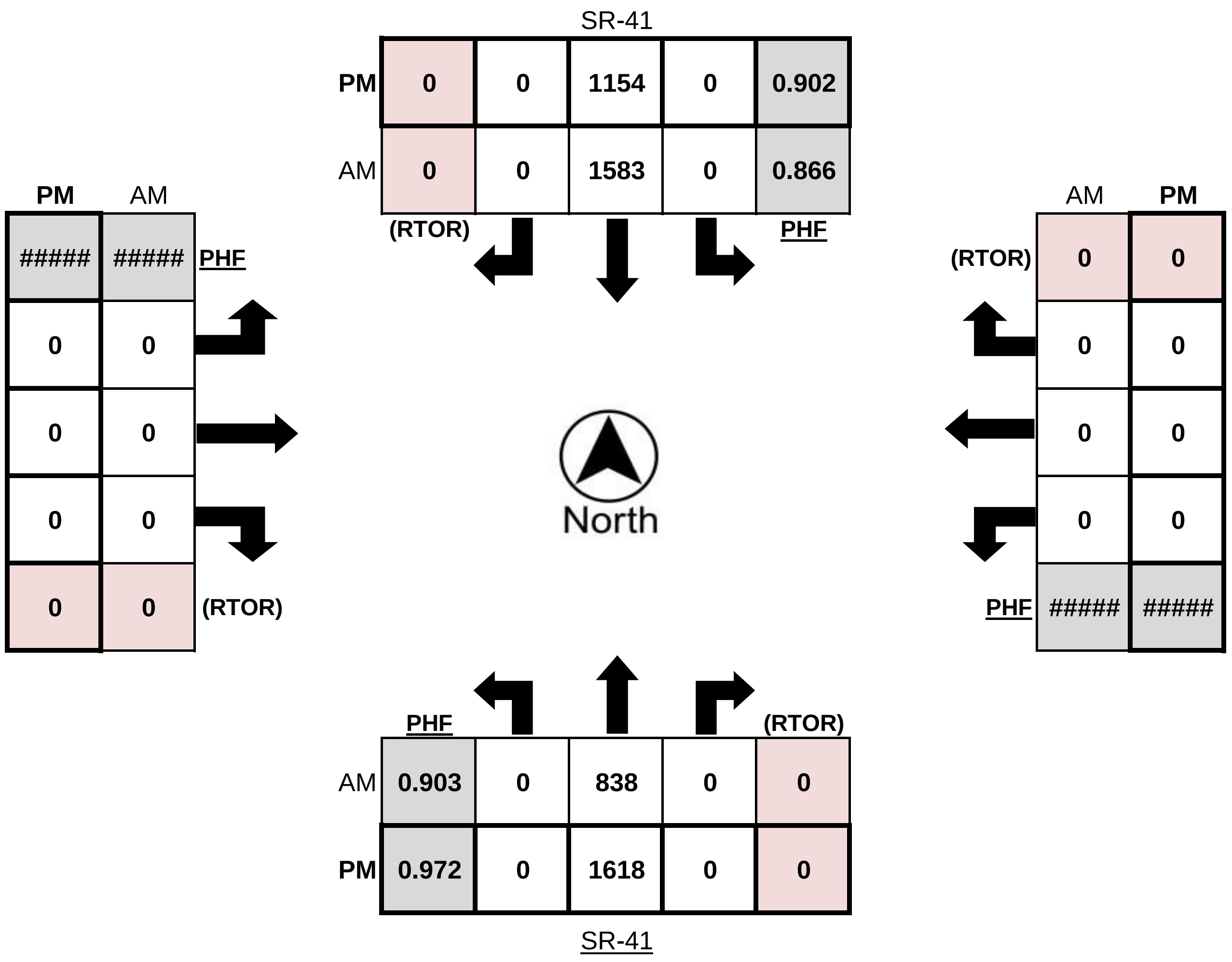
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	0	210	0	0	8	0	362	0	0	5	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	232	0	0	21	0	385	0	0	6	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	228	0	0	14	0	457	0	0	3	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	168	0	0	8	0	379	0	0	6	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	201	0	0	14	0	344	0	0	7	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	202	0	0	7	0	367	0	0	7	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	172	0	0	13	0	339	0	0	5	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	204	0	0	18	0	295	0	0	5	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1617**	**0**	**0**	**103**	**0**	**2928**	**0**	**0**	**44**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	0	382	0	0	3	0	318	0	0	7	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	381	0	0	3	0	279	0	0	6	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	371	0	0	3	0	278	0	0	8	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	391	0	0	0	0	267	0	0	8	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	404	0	0	2	0	277	0	0	2	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	416	0	0	4	0	320	0	0	3	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	407	0	0	4	0	290	0	0	2	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	351	0	0	3	0	225	0	0	3	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**3103**	**0**	**0**	**22**	**0**	**2254**	**0**	**0**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 8:00 AM	0	838	0	0	51	0	1583	0	0	20	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	1618	0	0	10	0	1154	0	0	15	0	0	0	0	0	0	0	0	0	0

	PHF	Trucks
AM	0.884	2.9%
PM	0.942	0.9%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

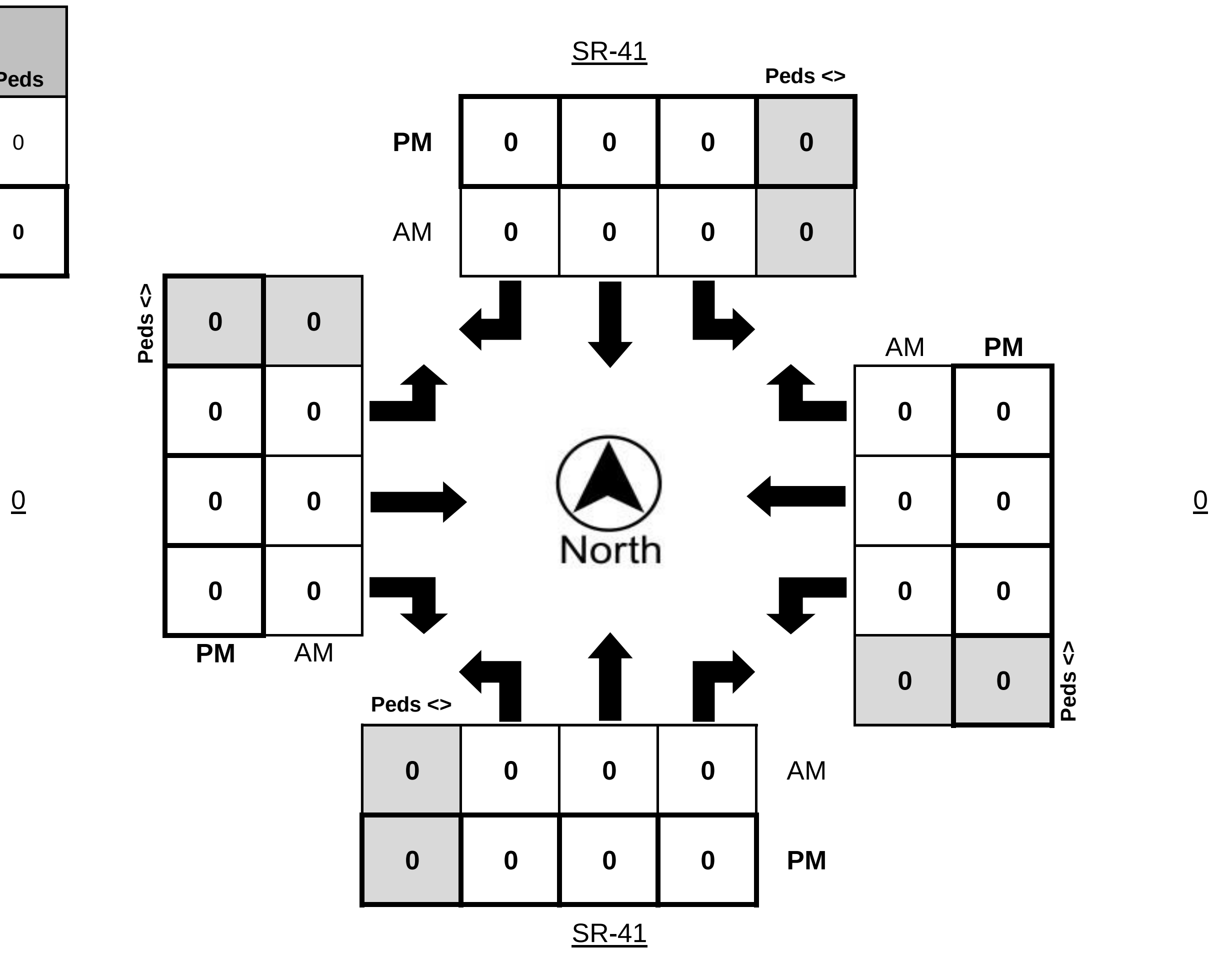
LOCATION SR-41 Mainline south of Ave 12
LATITUDE 36.9027
COUNTY Madera
LONGITUDE -119.7924
COLLECTION DATE Wednesday, May 22, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	**Peds**
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION SR-41 Mainline south of Ave 12

N/S STREET SR-41 / SR-41

COUNTY Madera

E/W STREET /

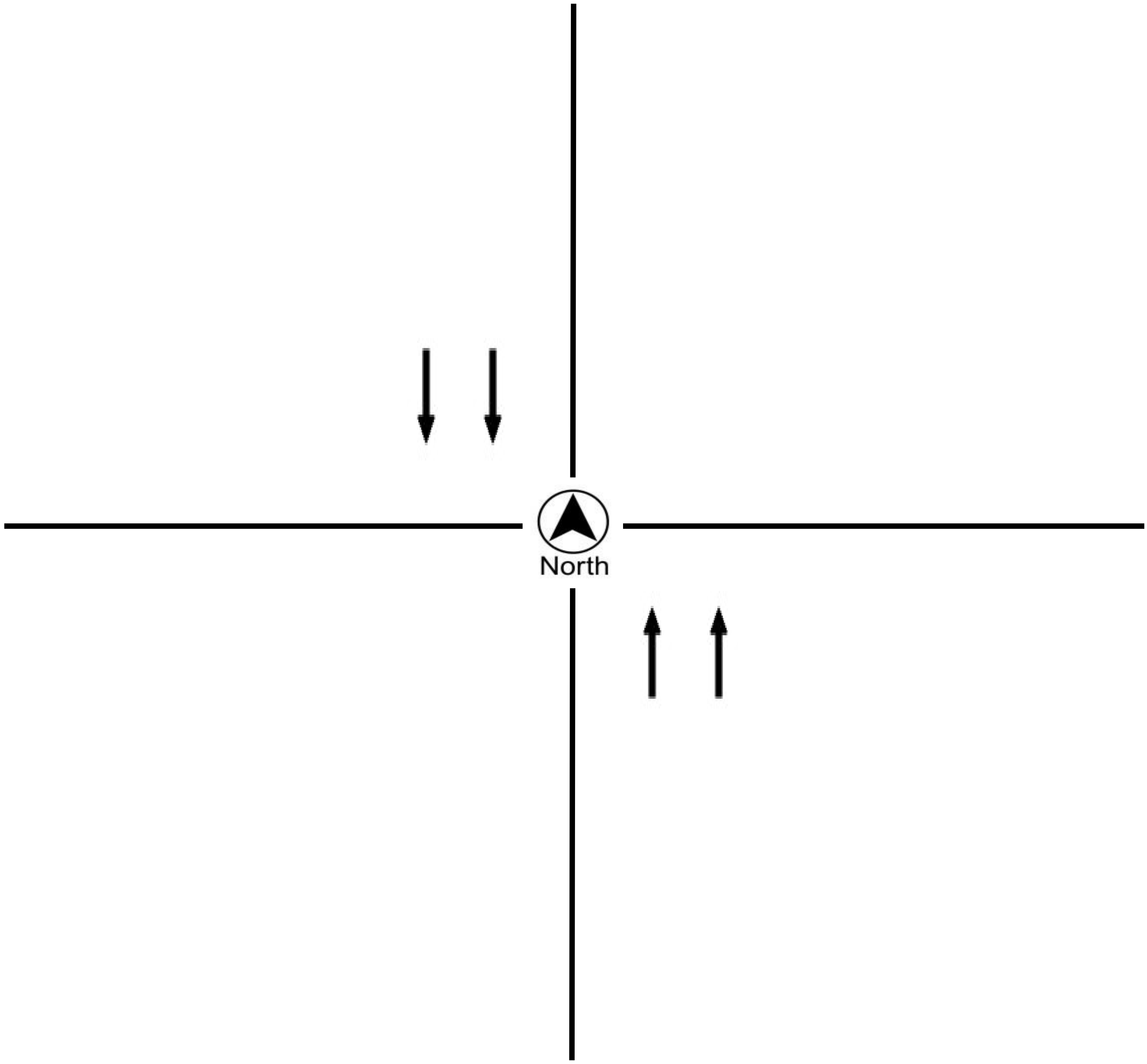
COLLECTION DATE Wednesday, May 22, 2019

WEATHER Clear

CYCLE TIME N/A

CONTROL TYPE N/A

COMMENTS



	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	319	39	13	11	92	360	33	24	732
v/c Ratio	0.12	0.64	0.19	0.03	0.02	0.38	0.24	0.04	0.18	0.66
Control Delay	33.4	14.5	34.2	25.3	0.1	36.5	13.5	0.1	38.8	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	14.5	34.2	25.3	0.1	36.5	13.5	0.1	38.8	22.7
Queue Length 50th (ft)	9	27	15	4	0	35	40	0	10	135
Queue Length 95th (ft)	36	104	48	20	0	#100	96	0	37	219
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	291	764	242	663	652	258	2754	1284	130	2600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.42	0.16	0.02	0.02	0.36	0.13	0.03	0.18	0.28

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑↑	↱	↰	↑↑↱	
Traffic Volume (veh/h)	22	27	253	34	11	10	81	317	29	21	632	11
Future Volume (veh/h)	22	27	253	34	11	10	81	317	29	21	632	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	25	31	288	39	12	11	92	360	33	24	718	14
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	41	37	346	58	463	392	119	1101	499	40	949	18
Arrive On Green	0.02	0.24	0.24	0.03	0.25	0.25	0.07	0.31	0.31	0.02	0.27	0.27
Sat Flow, veh/h	1781	156	1453	1781	1870	1585	1781	3497	1585	1781	3509	68
Grp Volume(v), veh/h	25	0	319	39	12	11	92	360	33	24	358	374
Grp Sat Flow(s),veh/h/ln	1781	0	1609	1781	1870	1585	1781	1749	1585	1781	1749	1828
Q Serve(g_s), s	0.8	0.0	10.8	1.2	0.3	0.3	2.9	4.5	0.8	0.8	10.7	10.7
Cycle Q Clear(g_c), s	0.8	0.0	10.8	1.2	0.3	0.3	2.9	4.5	0.8	0.8	10.7	10.7
Prop In Lane	1.00		0.90	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	41	0	383	58	463	392	119	1101	499	40	473	494
V/C Ratio(X)	0.61	0.00	0.83	0.68	0.03	0.03	0.78	0.33	0.07	0.61	0.76	0.76
Avail Cap(c_a), veh/h	278	0	578	231	534	453	247	2967	1345	125	1364	1426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	20.7	27.3	16.3	16.3	26.2	14.9	13.7	27.6	19.1	19.1
Incr Delay (d2), s/veh	13.9	0.0	6.4	13.0	0.0	0.0	10.3	0.2	0.1	14.1	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.3	0.7	0.1	0.1	1.4	1.4	0.3	0.4	3.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	27.1	40.3	16.3	16.3	36.5	15.1	13.7	41.7	21.6	21.5
LnGrp LOS	D	A	C	D	B	B	D	B	B	D	C	C
Approach Vol, veh/h		344			62			485			756	
Approach Delay, s/veh		28.1			31.4			19.1			22.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	24.5	6.5	20.1	8.5	21.9	6.0	20.6
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 4	48.4	* 7.4	20.5	* 7.9	44.5	* 8.9	16.3
Max Q Clear Time (g_c+I1), s	2.8	6.5	3.2	12.8	4.9	12.7	2.8	2.3
Green Ext Time (p_c), s	0.0	1.6	0.0	0.9	0.1	2.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: SR 41 & CO RD 14 1/2/CO RD 204

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	16	0	0	22	7	446	15	3	941	0
Future Vol, veh/h	0	0	16	0	0	22	7	446	15	3	941	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	17	0	0	24	8	485	16	3	1023	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1550	1546	1023	1547	1538	493	1023	0	0	501	0	0
Stage 1	1029	1029	-	509	509	-	-	-	-	-	-	-
Stage 2	521	517	-	1038	1029	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	93	114	286	93	116	576	679	-	-	1063	-	-
Stage 1	282	311	-	547	538	-	-	-	-	-	-	-
Stage 2	539	534	-	279	311	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	88	112	286	86	114	576	679	-	-	1063	-	-
Mov Cap-2 Maneuver	88	112	-	86	114	-	-	-	-	-	-	-
Stage 1	279	310	-	540	532	-	-	-	-	-	-	-
Stage 2	511	528	-	261	310	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	11.5	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	679	-	-	286	576	1063	-	-
HCM Lane V/C Ratio	0.011	-	-	0.061	0.042	0.003	-	-
HCM Control Delay (s)	10.4	-	-	18.4	11.5	8.4	-	-
HCM Lane LOS	B	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	727	1	1	460	462	11	1	1025	45
v/c Ratio	0.18	0.80	0.00	0.00	0.50	0.32	0.01	0.01	0.71	0.06
Control Delay	36.9	14.5	38.0	0.0	29.0	7.0	0.0	42.0	21.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	14.5	38.0	0.0	29.0	7.0	0.0	42.0	21.2	0.1
Queue Length 50th (ft)	17	58	0	0	91	65	0	0	196	0
Queue Length 95th (ft)	59	#335	6	0	#218	250	0	7	356	0
Internal Link Dist (ft)	4434		3885			1138			13157	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	509	909	1239	1099	918	1593	1393	109	2630	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.80	0.00	0.00	0.50	0.29	0.01	0.01	0.39	0.04

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	35	3	647	0	1	1	409	411	10	1	912	40
Future Volume (veh/h)	35	3	647	0	1	1	409	411	10	1	912	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	39	3	727	0	1	1	460	462	11	1	1025	45
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	349	27	588	0	8	7	557	938	808	2	1223	554
Arrive On Green	0.21	0.21	0.21	0.00	0.00	0.00	0.16	0.51	0.51	0.00	0.35	0.35
Sat Flow, veh/h	1660	128	1585	0	1870	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	42	0	727	0	1	1	460	462	11	1	1025	45
Grp Sat Flow(s),veh/h/ln	1787	0	1585	0	1870	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	1.7	0.0	18.5	0.0	0.0	0.1	11.3	14.5	0.3	0.0	23.7	1.7
Cycle Q Clear(g_c), s	1.7	0.0	18.5	0.0	0.0	0.1	11.3	14.5	0.3	0.0	23.7	1.7
Prop In Lane	0.93		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	375	0	588	0	8	7	557	938	808	2	1223	554
V/C Ratio(X)	0.11	0.00	1.24	0.00	0.12	0.15	0.83	0.49	0.01	0.49	0.84	0.08
Avail Cap(c_a), veh/h	375	0	588	0	913	774	679	1327	1143	81	1994	904
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	27.7	0.0	43.7	43.7	35.7	14.1	10.7	44.0	26.3	19.2
Incr Delay (d2), s/veh	0.1	0.0	120.2	0.0	6.6	9.4	7.0	0.4	0.0	122.3	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	31.3	0.0	0.0	0.0	5.2	5.7	0.1	0.1	8.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	0.0	147.9	0.0	50.3	53.1	42.7	14.5	10.7	166.2	28.1	19.2
LnGrp LOS	C	A	F	A	D	D	D	B	B	F	C	B
Approach Vol, veh/h		769			2			933			1071	
Approach Delay, s/veh		141.3			51.7			28.4			27.9	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	51.4		25.0	18.9	37.3		6.9
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		6.5
Max Green Setting (Gmax), s	* 4	63.5		18.5	* 17	50.2		43.0
Max Q Clear Time (g_c+I1), s	2.0	16.5		20.5	13.3	25.7		2.1
Green Ext Time (p_c), s	0.0	2.1		0.0	0.8	5.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	59.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
4: AVENUE 12 & RIO MESA

AM EXISTING
11/05/2020

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Vol, veh/h	0	13	2	0	0	0
Future Vol, veh/h	0	13	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	2	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	16	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	14	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	1002	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	1002	1082
Mov Cap-2 Maneuver	-	-	-	-	1002	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1009	-

Approach	EB		WB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

1: SR 41 & Avenue 15

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	186	20	7	9	236	783	37	61	501
v/c Ratio	0.16	0.47	0.12	0.03	0.02	0.53	0.50	0.05	0.38	0.59
Control Delay	29.0	11.3	30.9	26.3	0.1	25.2	13.6	0.1	37.4	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	11.3	30.9	26.3	0.1	25.2	13.6	0.1	37.4	22.9
Queue Length 50th (ft)	10	6	6	2	0	62	91	0	19	72
Queue Length 95th (ft)	43	63	30	14	0	173	194	0	#78	157
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	216	1052	169	1118	1019	564	2708	1263	159	1904
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.18	0.12	0.01	0.01	0.42	0.29	0.03	0.38	0.26

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	31	18	153	18	6	8	217	720	34	56	441	20
Future Volume (veh/h)	31	18	153	18	6	8	217	720	34	56	441	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	34	20	166	20	7	9	236	783	37	61	479	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	54	28	229	35	277	235	304	1150	521	81	695	32
Arrive On Green	0.03	0.16	0.16	0.02	0.15	0.15	0.17	0.33	0.33	0.05	0.20	0.20
Sat Flow, veh/h	1781	173	1438	1781	1870	1585	1781	3497	1585	1781	3405	156
Grp Volume(v), veh/h	34	0	186	20	7	9	236	783	37	61	246	255
Grp Sat Flow(s),veh/h/ln	1781	0	1611	1781	1870	1585	1781	1749	1585	1781	1749	1813
Q Serve(g_s), s	0.9	0.0	5.5	0.6	0.2	0.2	6.3	9.7	0.8	1.7	6.5	6.5
Cycle Q Clear(g_c), s	0.9	0.0	5.5	0.6	0.2	0.2	6.3	9.7	0.8	1.7	6.5	6.5
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	54	0	256	35	277	235	304	1150	521	81	357	370
V/C Ratio(X)	0.63	0.00	0.73	0.58	0.03	0.04	0.78	0.68	0.07	0.75	0.69	0.69
Avail Cap(c_a), veh/h	213	0	1094	188	1243	1053	629	3023	1370	178	1068	1107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	20.0	24.4	18.2	18.3	19.9	14.5	11.6	23.6	18.5	18.5
Incr Delay (d2), s/veh	11.7	0.0	3.9	14.4	0.0	0.1	4.3	0.7	0.1	12.9	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	2.1	0.4	0.1	0.1	2.4	2.8	0.3	0.9	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	23.9	38.7	18.3	18.3	24.2	15.3	11.6	36.5	20.8	20.8
LnGrp LOS	D	A	C	D	B	B	C	B	B	D	C	C
Approach Vol, veh/h		220			36			1056			562	
Approach Delay, s/veh		25.8			29.7			17.1			22.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	23.0	5.7	14.5	13.2	16.7	6.2	13.9
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 5	43.3	* 5.3	34.0	* 18	30.6	* 6	33.3
Max Q Clear Time (g_c+I1), s	3.7	11.7	2.6	7.5	8.3	8.5	2.9	2.2
Green Ext Time (p_c), s	0.0	3.7	0.0	0.8	0.5	1.7	0.0	0.0

Intersection Summary			
HCM 6th Ctrl Delay			20.0
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
2: SR 41 & AVE 14 1/2/CO RD 204

PM 2019 PEAK HOUR
11/05/2020

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	11	0	0	19	18	971	30	3	619	2
Future Vol, veh/h	0	0	11	0	0	19	18	971	30	3	619	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	12	0	0	21	20	1055	33	3	673	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1802	1808	674	1798	1793	1072	675	0	0	1088	0	0
Stage 1	680	680	-	1112	1112	-	-	-	-	-	-	-
Stage 2	1122	1128	-	686	681	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	62	79	455	62	81	268	916	-	-	641	-	-
Stage 1	441	451	-	253	284	-	-	-	-	-	-	-
Stage 2	250	279	-	438	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	77	455	59	79	268	916	-	-	641	-	-
Mov Cap-2 Maneuver	56	77	-	59	79	-	-	-	-	-	-	-
Stage 1	431	449	-	247	278	-	-	-	-	-	-	-
Stage 2	226	273	-	424	448	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	19.6	0.2	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	916	-	-	455	268	641	-	-
HCM Lane V/C Ratio	0.021	-	-	0.026	0.077	0.005	-	-
HCM Control Delay (s)	9	-	-	13.1	19.6	10.6	-	-
HCM Lane LOS	A	-	-	B	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.2	0	-	-

Queues
3: AVE 12 & SR 41

PM 2019 PEAK HOUR
11/05/2020

	→	↘	←	↖	↖	↑	↗	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	75	660	30	3	633	1064	14	673	11
v/c Ratio	0.41	0.85	0.20	0.01	0.73	0.78	0.01	0.45	0.01
Control Delay	51.8	22.7	49.5	0.0	39.6	17.8	0.0	25.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	22.7	49.5	0.0	39.6	17.8	0.0	25.3	0.0
Queue Length 50th (ft)	49	151	19	0	200	510	0	185	0
Queue Length 95th (ft)	96	256	50	0	271	#964	0	271	0
Internal Link Dist (ft)	4434		3123			1138		12757	
Turn Bay Length (ft)		1000		100	650		650		100
Base Capacity (vph)	247	849	368	456	1063	1367	1210	1639	822
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.78	0.08	0.01	0.60	0.78	0.01	0.41	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	67	2	607	24	4	3	582	979	13	0	619	10
Future Volume (veh/h)	67	2	607	24	4	3	582	979	13	0	619	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	73	2	660	26	4	3	633	1064	14	0	673	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	256	7	588	77	12	79	773	1136	978	2	1197	543
Arrive On Green	0.15	0.15	0.15	0.05	0.05	0.05	0.22	0.62	0.62	0.00	0.34	0.34
Sat Flow, veh/h	1736	48	1585	1554	239	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	75	0	660	30	0	3	633	1064	14	0	673	11
Grp Sat Flow(s),veh/h/ln	1784	0	1585	1793	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	3.4	0.0	13.5	1.5	0.0	0.2	15.9	48.0	0.3	0.0	14.4	0.4
Cycle Q Clear(g_c), s	3.4	0.0	13.5	1.5	0.0	0.2	15.9	48.0	0.3	0.0	14.4	0.4
Prop In Lane	0.97		1.00	0.87		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	0	588	89	0	79	773	1136	978	2	1197	543
V/C Ratio(X)	0.29	0.00	1.12	0.34	0.00	0.04	0.82	0.94	0.01	0.00	0.56	0.02
Avail Cap(c_a), veh/h	263	0	588	392	0	346	1132	1423	1226	78	1711	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	28.8	42.1	0.0	41.4	33.8	15.9	6.8	0.0	24.5	19.9
Incr Delay (d2), s/veh	0.6	0.0	75.4	2.2	0.0	0.2	3.1	10.4	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	24.6	0.7	0.0	0.1	6.9	20.6	0.1	0.0	5.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	0.0	104.2	44.3	0.0	41.6	36.9	26.2	6.8	0.0	24.9	20.0
LnGrp LOS	D	A	F	D	A	D	D	C	A	A	C	B
Approach Vol, veh/h		735			33			1711			684	
Approach Delay, s/veh		97.2			44.0			30.0			24.9	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	63.0		20.0	25.2	37.8		8.5				
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		4.0				
Max Green Setting (Gmax), s	* 4	70.8		13.5	* 30	44.8		20.0				
Max Q Clear Time (g_c+I1), s	0.0	50.0		15.5	17.9	16.4		3.5				
Green Ext Time (p_c), s	0.0	6.5		0.0	2.5	3.0		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	44.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		⋎	
Traffic Vol, veh/h	0	16	34	0	0	0
Future Vol, veh/h	0	16	34	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	17	37	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	37	0	-	0	54	37
Stage 1	-	-	-	-	37	-
Stage 2	-	-	-	-	17	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1574	-	-	-	954	1035
Stage 1	-	-	-	-	985	-
Stage 2	-	-	-	-	1006	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1574	-	-	-	954	1035
Mov Cap-2 Maneuver	-	-	-	-	954	-
Stage 1	-	-	-	-	985	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1574	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

1: SR 41 & Avenue 15

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	348	352	32	49	99	389	91	34	791
v/c Ratio	0.23	0.84	0.81	0.04	0.07	0.59	0.34	0.14	0.28	0.80
Control Delay	51.0	37.4	49.9	21.7	0.2	59.7	25.5	0.5	51.8	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	37.4	49.9	21.7	0.2	59.7	25.5	0.5	51.8	38.7
Queue Length 50th (ft)	17	96	216	14	0	64	103	0	22	251
Queue Length 95th (ft)	45	#231	#345	34	0	#131	141	0	53	315
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	118	468	523	790	750	182	1336	724	127	1182
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.74	0.67	0.04	0.07	0.54	0.29	0.13	0.27	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	24	33	273	310	28	43	87	342	80	30	683	12
Future Volume (veh/h)	24	33	273	310	28	43	87	342	80	30	683	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	27	38	310	352	32	49	99	389	91	34	776	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	39	33	272	399	732	620	127	1061	481	46	905	17
Arrive On Green	0.02	0.19	0.19	0.22	0.39	0.39	0.07	0.30	0.30	0.03	0.26	0.26
Sat Flow, veh/h	1781	176	1436	1781	1870	1585	1781	3497	1585	1781	3509	68
Grp Volume(v), veh/h	27	0	348	352	32	49	99	389	91	34	387	404
Grp Sat Flow(s),veh/h/ln	1781	0	1612	1781	1870	1585	1781	1749	1585	1781	1749	1829
Q Serve(g_s), s	1.3	0.0	16.5	16.6	0.9	1.7	4.8	7.6	3.7	1.6	18.3	18.3
Cycle Q Clear(g_c), s	1.3	0.0	16.5	16.6	0.9	1.7	4.8	7.6	3.7	1.6	18.3	18.3
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	39	0	306	399	732	620	127	1061	481	46	451	472
V/C Ratio(X)	0.69	0.00	1.14	0.88	0.04	0.08	0.78	0.37	0.19	0.74	0.86	0.86
Avail Cap(c_a), veh/h	119	0	306	522	778	660	182	1291	585	127	591	618
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	35.2	32.7	16.4	16.6	39.7	23.8	22.4	42.1	30.7	30.7
Incr Delay (d2), s/veh	19.2	0.0	94.2	13.3	0.0	0.1	12.8	0.2	0.2	20.6	9.5	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	14.3	8.4	0.4	0.6	2.4	2.8	1.4	0.9	8.1	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	0.0	129.4	46.0	16.4	16.7	52.6	24.0	22.6	62.7	40.3	39.9
LnGrp LOS	E	A	F	D	B	B	D	C	C	E	D	D
Approach Vol, veh/h		375			433			579			825	
Approach Delay, s/veh		124.5			40.5			28.6			41.0	
Approach LOS		F			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	32.9	24.2	23.0	10.9	28.9	6.6	40.5
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 6.2	32.1	* 26	16.5	* 8.9	29.4	* 5.8	36.2
Max Q Clear Time (g_c+I1), s	3.6	9.6	18.6	18.5	6.8	20.3	3.3	3.7
Green Ext Time (p_c), s	0.0	1.9	0.8	0.0	0.0	2.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	17	0	0	24	7	532	27	3	1289	0
Future Vol, veh/h	0	0	17	0	0	24	7	532	27	3	1289	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	18	0	0	26	8	578	29	3	1401	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2029	2030	1401	2025	2016	593	1401	0	0	607	0	0
Stage 1	1407	1407	-	609	609	-	-	-	-	-	-	-
Stage 2	622	623	-	1416	1407	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	43	57	172	43	59	506	488	-	-	971	-	-
Stage 1	172	205	-	482	485	-	-	-	-	-	-	-
Stage 2	474	478	-	170	205	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	40	56	172	38	58	506	488	-	-	971	-	-
Mov Cap-2 Maneuver	40	56	-	38	58	-	-	-	-	-	-	-
Stage 1	169	204	-	474	477	-	-	-	-	-	-	-
Stage 2	442	470	-	151	204	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.4	12.5	0.2	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	488	-	-	172	506	971	-	-
HCM Lane V/C Ratio	0.016	-	-	0.107	0.052	0.003	-	-
HCM Control Delay (s)	12.5	-	-	28.4	12.5	8.7	-	-
HCM Lane LOS	B	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.2	0	-	-

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	785	1	1	497	562	12	1	1396	66
v/c Ratio	0.35	0.95	0.01	0.00	0.71	0.39	0.01	0.01	0.74	0.07
Control Delay	54.1	35.8	47.0	0.0	45.1	6.4	0.0	51.0	21.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	35.8	47.0	0.0	45.1	6.4	0.0	51.0	21.9	0.2
Queue Length 50th (ft)	31	208	1	0	154	85	0	1	341	0
Queue Length 95th (ft)	76	#620	6	0	#256	297	0	7	557	0
Internal Link Dist (ft)	4434		3885			1138			13157	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	142	822	804	763	699	1457	1284	71	1900	930
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.95	0.00	0.00	0.71	0.39	0.01	0.01	0.73	0.07

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	42	3	699	0	1	1	442	500	11	1	1242	59
Future Volume (veh/h)	42	3	699	0	1	1	442	500	11	1	1242	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	47	3	785	0	1	1	497	562	12	1	1396	66
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	150	10	419	0	8	7	604	1169	1007	2	1613	731
Arrive On Green	0.09	0.09	0.09	0.00	0.00	0.00	0.17	0.64	0.64	0.00	0.46	0.46
Sat Flow, veh/h	1679	107	1585	0	1870	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	50	0	785	0	1	1	497	562	12	1	1396	66
Grp Sat Flow(s),veh/h/ln	1786	0	1585	0	1870	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	2.3	0.0	8.0	0.0	0.0	0.1	12.4	14.4	0.2	0.1	32.1	2.1
Cycle Q Clear(g_c), s	2.3	0.0	8.0	0.0	0.0	0.1	12.4	14.4	0.2	0.1	32.1	2.1
Prop In Lane	0.94		1.00	0.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	0	419	0	8	7	604	1169	1007	2	1613	731
V/C Ratio(X)	0.31	0.00	1.87	0.00	0.12	0.15	0.82	0.48	0.01	0.50	0.87	0.09
Avail Cap(c_a), veh/h	160	0	419	0	898	761	783	1455	1253	80	2128	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	0.0	33.0	0.0	44.4	44.4	35.6	8.6	6.0	44.7	21.6	13.6
Incr Delay (d2), s/veh	1.1	0.0	402.6	0.0	6.6	9.4	5.5	0.3	0.0	126.4	3.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	55.6	0.0	0.0	0.0	5.6	5.1	0.1	0.1	11.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	0.0	435.5	0.0	51.1	53.8	41.1	8.9	6.0	171.1	24.8	13.6
LnGrp LOS	D	A	F	A	D	D	D	A	A	F	C	B
Approach Vol, veh/h		835			2			1071			1463	
Approach Delay, s/veh		411.8			52.4			23.8			24.4	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	63.4		14.5	20.4	47.8		6.9
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		6.5
Max Green Setting (Gmax), s	* 4	70.8		8.0	* 20	54.5		43.0
Max Q Clear Time (g_c+I1), s	2.1	16.4		10.0	14.4	34.1		2.1
Green Ext Time (p_c), s	0.0	2.7		0.0	1.3	7.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	120.2
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		Y	
Traffic Vol, veh/h	0	14	2	0	0	0
Future Vol, veh/h	0	14	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	2	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	17	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	15	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	1001	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1008	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	1001	1082
Mov Cap-2 Maneuver	-	-	-	-	1001	-
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	1008	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1620	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	222	250	21	37	255	846	365	111	541
v/c Ratio	0.33	0.57	2.27	0.05	0.07	0.78	0.64	0.44	0.60	0.60
Control Delay	40.4	14.1	623.4	24.7	0.2	45.6	20.1	3.9	46.4	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	14.1	623.4	24.7	0.2	45.6	20.1	3.9	46.4	24.0
Queue Length 50th (ft)	14	15	~161	6	0	94	143	0	42	94
Queue Length 95th (ft)	45	76	#335	26	0	#245	226	50	#126	153
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	110	485	110	450	577	338	1527	901	187	1226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.46	2.27	0.05	0.06	0.75	0.55	0.41	0.59	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	33	40	165	230	19	34	235	778	336	102	476	22
Future Volume (veh/h)	33	40	165	230	19	34	235	778	336	102	476	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	36	43	179	250	21	37	255	846	365	111	517	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	53	53	220	116	379	321	305	1128	511	142	787	36
Arrive On Green	0.03	0.17	0.17	0.07	0.20	0.20	0.17	0.32	0.32	0.08	0.23	0.23
Sat Flow, veh/h	1781	316	1317	1781	1870	1585	1781	3497	1585	1781	3403	158
Grp Volume(v), veh/h	36	0	222	250	21	37	255	846	365	111	265	276
Grp Sat Flow(s),veh/h/ln	1781	0	1633	1781	1870	1585	1781	1749	1585	1781	1749	1812
Q Serve(g_s), s	1.2	0.0	8.0	4.0	0.6	1.2	8.5	13.3	12.4	3.8	8.4	8.5
Cycle Q Clear(g_c), s	1.2	0.0	8.0	4.0	0.6	1.2	8.5	13.3	12.4	3.8	8.4	8.5
Prop In Lane	1.00		0.81	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	53	0	273	116	379	321	305	1128	511	142	404	419
V/C Ratio(X)	0.68	0.00	0.81	2.15	0.06	0.12	0.84	0.75	0.71	0.78	0.66	0.66
Avail Cap(c_a), veh/h	116	0	359	116	411	349	357	1612	731	197	649	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	24.6	28.7	19.7	20.0	24.6	18.6	18.3	27.7	21.4	21.4
Incr Delay (d2), s/veh	13.9	0.0	10.2	546.9	0.1	0.2	13.9	1.2	1.9	12.4	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	3.7	19.2	0.2	0.4	4.2	4.4	4.4	1.9	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	0.0	34.8	575.6	19.8	20.1	38.5	19.8	20.2	40.2	23.2	23.2
LnGrp LOS	D	A	C	F	B	C	D	B	C	D	C	C
Approach Vol, veh/h		258			308			1466			652	
Approach Delay, s/veh		36.0			471.0			23.1			26.1	
Approach LOS		D			F			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	26.3	8.7	16.8	15.2	20.7	6.5	18.9
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 6.8	28.3	* 4	13.5	* 12	22.8	* 4	13.5
Max Q Clear Time (g_c+I1), s	5.8	15.3	6.0	10.0	10.5	10.5	3.2	3.2
Green Ext Time (p_c), s	0.0	4.5	0.0	0.3	0.2	1.6	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	76.5
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	12	0	0	20	18	1330	97	3	880	2
Future Vol, veh/h	0	0	12	0	0	20	18	1330	97	3	880	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	13	0	0	22	20	1446	105	3	957	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2514	2555	958	2510	2504	1499	959	0	0	1551	0	0
Stage 1	964	964	-	1539	1539	-	-	-	-	-	-	-
Stage 2	1550	1591	-	971	965	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	19	27	312	19	29	150	717	-	-	427	-	-
Stage 1	307	334	-	145	177	-	-	-	-	-	-	-
Stage 2	142	167	-	304	333	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	16	26	312	18	28	150	717	-	-	427	-	-
Mov Cap-2 Maneuver	16	26	-	18	28	-	-	-	-	-	-	-
Stage 1	298	332	-	141	172	-	-	-	-	-	-	-
Stage 2	118	162	-	289	331	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	17			33			0.1			0		
HCM LOS	C			D								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	717	-	-	312	150	427	-	-
HCM Lane V/C Ratio	0.027	-	-	0.042	0.145	0.008	-	-
HCM Control Delay (s)	10.2	-	-	17	33	13.5	-	-
HCM Lane LOS	B	-	-	C	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.5	0	-	-

3: AVE 12 & SR 41

	→	↘	←	↖	↖	↑	↗	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	103	713	32	3	684	1521	14	943	25
v/c Ratio	0.56	0.88	0.22	0.01	0.72	1.18	0.01	0.71	0.04
Control Delay	60.0	29.7	54.2	0.0	39.9	108.0	0.0	34.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	29.7	54.2	0.0	39.9	108.0	0.0	34.3	0.1
Queue Length 50th (ft)	74	233	23	0	226	~1392	0	335	0
Queue Length 95th (ft)	135	#454	56	0	305	#1735	0	437	0
Internal Link Dist (ft)	4434		3123			1138		12757	
Turn Bay Length (ft)		1000		100	650		650		100
Base Capacity (vph)	227	886	271	383	1147	1291	1149	1336	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.80	0.12	0.01	0.60	1.18	0.01	0.71	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: AVE 12 & SR 41

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	93	2	656	26	4	3	629	1399	13	0	868	23
Future Volume (veh/h)	93	2	656	26	4	3	629	1399	13	0	868	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	101	2	713	28	4	3	684	1521	14	0	943	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	224	4	576	76	11	77	813	1219	1049	2	1337	606
Arrive On Green	0.13	0.13	0.13	0.05	0.05	0.05	0.24	0.66	0.66	0.00	0.38	0.38
Sat Flow, veh/h	1748	35	1585	1568	224	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	103	0	713	32	0	3	684	1521	14	0	943	25
Grp Sat Flow(s),veh/h/ln	1783	0	1585	1792	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	5.6	0.0	13.5	1.8	0.0	0.2	19.9	69.8	0.3	0.0	24.0	1.0
Cycle Q Clear(g_c), s	5.6	0.0	13.5	1.8	0.0	0.2	19.9	69.8	0.3	0.0	24.0	1.0
Prop In Lane	0.98		1.00	0.87		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	0	576	87	0	77	813	1219	1049	2	1337	606
V/C Ratio(X)	0.45	0.00	1.24	0.37	0.00	0.04	0.84	1.25	0.01	0.00	0.71	0.04
Avail Cap(c_a), veh/h	228	0	576	272	0	241	1154	1219	1049	68	1337	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	33.6	48.6	0.0	47.8	38.4	17.8	6.1	0.0	27.5	20.4
Incr Delay (d2), s/veh	1.4	0.0	121.5	2.6	0.0	0.2	4.0	118.6	0.0	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	33.7	0.9	0.0	0.1	8.8	65.5	0.1	0.0	9.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	0.0	155.1	51.1	0.0	48.0	42.5	136.5	6.1	0.0	29.3	20.5
LnGrp LOS	D	A	F	D	A	D	D	F	A	A	C	C
Approach Vol, veh/h		816			35			2219			968	
Approach Delay, s/veh		141.1			50.9			106.7			29.0	
Approach LOS		F			D			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	76.3		20.0	29.5	46.8		9.1				
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		4.0				
Max Green Setting (Gmax), s	* 4	69.8		13.5	* 35	38.6		16.0				
Max Q Clear Time (g_c+I1), s	0.0	71.8		15.5	21.9	26.0		3.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	2.9	3.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		94.5
HCM 6th LOS		F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	0	17	37	0	0	0
Future Vol, veh/h	0	17	37	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	40	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	40	0	-	0	58	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	18	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1570	-	-	-	949	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1005	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1570	-	-	-	949	1031
Mov Cap-2 Maneuver	-	-	-	-	949	-
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1570	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Queues

1: SR 41 & Avenue 15

AM 2022 PLUS PROJ

11/05/2020

	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	348	275	32	49	99	389	78	34	791
v/c Ratio	0.22	0.80	0.71	0.04	0.07	0.55	0.33	0.12	0.26	0.78
Control Delay	48.8	29.0	43.7	20.8	0.2	55.0	23.8	0.4	49.3	35.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	29.0	43.7	20.8	0.2	55.0	23.8	0.4	49.3	35.9
Queue Length 50th (ft)	15	64	149	11	0	56	90	0	19	220
Queue Length 95th (ft)	45	#193	243	34	0	#131	141	0	53	315
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	127	513	561	848	795	196	1418	757	136	1268
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.68	0.49	0.04	0.06	0.51	0.27	0.10	0.25	0.62

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
1: SR 41 & Avenue 15

AM 2022 PLUS PROJ
11/05/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	24	33	273	242	28	43	87	342	69	30	683	12
Future Volume (veh/h)	24	33	273	242	28	43	87	342	69	30	683	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	27	38	310	275	32	49	99	389	78	34	776	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	40	36	294	327	684	580	127	1075	487	47	921	18
Arrive On Green	0.02	0.20	0.20	0.18	0.37	0.37	0.07	0.31	0.31	0.03	0.26	0.26
Sat Flow, veh/h	1781	176	1436	1781	1870	1585	1781	3497	1585	1781	3509	68
Grp Volume(v), veh/h	27	0	348	275	32	49	99	389	78	34	387	404
Grp Sat Flow(s),veh/h/ln	1781	0	1612	1781	1870	1585	1781	1749	1585	1781	1749	1829
Q Serve(g_s), s	1.2	0.0	16.5	12.0	0.9	1.6	4.4	7.0	2.9	1.5	16.9	16.9
Cycle Q Clear(g_c), s	1.2	0.0	16.5	12.0	0.9	1.6	4.4	7.0	2.9	1.5	16.9	16.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	40	0	330	327	684	580	127	1075	487	47	459	480
V/C Ratio(X)	0.67	0.00	1.05	0.84	0.05	0.08	0.78	0.36	0.16	0.72	0.84	0.84
Avail Cap(c_a), veh/h	128	0	330	563	840	712	197	1392	631	137	638	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	0.0	32.1	31.8	16.5	16.7	36.8	21.8	20.3	39.0	28.2	28.2
Incr Delay (d2), s/veh	17.8	0.0	64.7	5.8	0.0	0.1	10.0	0.2	0.2	18.6	7.3	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	12.1	5.5	0.4	0.6	2.1	2.5	1.1	0.9	7.1	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	0.0	96.8	37.6	16.5	16.8	46.8	22.0	20.5	57.6	35.4	35.2
LnGrp LOS	E	A	F	D	B	B	D	C	C	E	D	D
Approach Vol, veh/h		375			356			566			825	
Approach Delay, s/veh		93.9			32.8			26.1			36.2	
Approach LOS		F			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	31.3	19.5	23.0	10.5	27.7	6.5	36.0
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 6.2	32.1	* 26	16.5	* 8.9	29.4	* 5.8	36.2
Max Q Clear Time (g_c+I1), s	3.5	9.0	14.0	18.5	6.4	18.9	3.2	3.6
Green Ext Time (p_c), s	0.0	1.8	0.8	0.0	0.1	2.3	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	17	0	0	24	7	521	23	3	1221	0
Future Vol, veh/h	0	0	17	0	0	24	7	521	23	3	1221	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	18	0	0	26	8	566	25	3	1327	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1941	1940	1327	1937	1928	579	1327	0	0	591	0	0
Stage 1	1333	1333	-	595	595	-	-	-	-	-	-	-
Stage 2	608	607	-	1342	1333	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	49	65	190	49	66	515	520	-	-	985	-	-
Stage 1	190	223	-	491	492	-	-	-	-	-	-	-
Stage 2	483	486	-	188	223	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	46	64	190	44	65	515	520	-	-	985	-	-
Mov Cap-2 Maneuver	46	64	-	44	65	-	-	-	-	-	-	-
Stage 1	187	222	-	484	485	-	-	-	-	-	-	-
Stage 2	451	479	-	169	222	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	12.4	0.2	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	520	-	-	190	515	985	-	-
HCM Lane V/C Ratio	0.015	-	-	0.097	0.051	0.003	-	-
HCM Control Delay (s)	12	-	-	26	12.4	8.7	-	-
HCM Lane LOS	B	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Queues

AM 2022 PLUS PROJ

3: AVENUE 12 & SR 41

11/05/2020

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	785	78	1	497	546	28	1	1324	62
v/c Ratio	0.39	1.19	0.46	0.00	0.79	0.41	0.02	0.02	0.77	0.07
Control Delay	62.7	118.8	59.6	0.0	55.3	10.8	0.0	57.0	29.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	118.8	59.6	0.0	55.3	10.8	0.0	57.0	29.4	0.2
Queue Length 50th (ft)	37	~514	57	0	189	173	0	1	446	0
Queue Length 95th (ft)	80	#811	107	0	#279	329	0	7	566	0
Internal Link Dist (ft)	4434		3885			1138			13157	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	129	661	695	704	633	1320	1174	64	1718	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	1.19	0.11	0.00	0.79	0.41	0.02	0.02	0.77	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	41	4	699	64	5	1	442	486	25	1	1178	55
Future Volume (veh/h)	41	4	699	64	5	1	442	486	25	1	1178	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	46	4	785	72	6	1	497	546	28	1	1324	62
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	133	12	398	118	10	114	588	1106	953	2	1511	685
Arrive On Green	0.08	0.08	0.08	0.07	0.07	0.07	0.17	0.60	0.60	0.00	0.43	0.43
Sat Flow, veh/h	1645	143	1585	1650	138	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	50	0	785	78	0	1	497	546	28	1	1324	62
Grp Sat Flow(s),veh/h/ln	1788	0	1585	1788	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	2.6	0.0	8.0	4.2	0.0	0.1	13.8	16.6	0.7	0.1	34.2	2.3
Cycle Q Clear(g_c), s	2.6	0.0	8.0	4.2	0.0	0.1	13.8	16.6	0.7	0.1	34.2	2.3
Prop In Lane	0.92		1.00	0.92		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	398	128	0	114	588	1106	953	2	1511	685
V/C Ratio(X)	0.35	0.00	1.97	0.61	0.00	0.01	0.85	0.49	0.03	0.51	0.88	0.09
Avail Cap(c_a), veh/h	145	0	398	779	0	690	711	1320	1137	72	1931	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	0.0	37.0	44.5	0.0	42.6	39.7	11.2	8.0	49.3	25.6	16.6
Incr Delay (d2), s/veh	1.4	0.0	446.4	4.6	0.0	0.0	7.9	0.3	0.0	131.0	4.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	58.7	2.0	0.0	0.0	6.4	6.4	0.2	0.1	13.2	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	0.0	483.4	49.1	0.0	42.6	47.7	11.5	8.0	180.3	29.6	16.6
LnGrp LOS	D	A	F	D	A	D	D	B	A	F	C	B
Approach Vol, veh/h		835			79			1071			1387	
Approach Delay, s/veh		457.1			49.0			28.2			29.2	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	65.8		14.5	21.5	49.2		13.6				
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		6.5				
Max Green Setting (Gmax), s	* 4	70.8		8.0	* 20	54.5		43.0				
Max Q Clear Time (g_c+I1), s	2.1	18.6		10.0	15.8	36.2		6.2				
Green Ext Time (p_c), s	0.0	2.7		0.0	1.0	6.5		0.3				

Intersection Summary				
HCM 6th Ctrl Delay			135.3	
HCM 6th LOS			F	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	5	14	2	0	0	68
Future Vol, veh/h	5	14	2	0	0	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	15	2	0	0	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	27	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	25	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	988	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	998	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	985	1082
Mov Cap-2 Maneuver	-	-	-	-	985	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	998	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1620	-	-	-	-	1082
HCM Lane V/C Ratio	0.003	-	-	-	-	0.068
HCM Control Delay (s)	7.2	-	-	-	0	8.6
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

1: SR 41 & Avenue 15

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	222	193	20	37	255	846	297	111	541
v/c Ratio	0.33	0.57	1.75	0.05	0.07	0.77	0.65	0.38	0.60	0.61
Control Delay	40.1	14.0	398.4	24.4	0.2	44.8	20.3	3.8	45.9	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	14.0	398.4	24.4	0.2	44.8	20.3	3.8	45.9	24.3
Queue Length 50th (ft)	14	15	~111	6	0	92	143	0	41	94
Queue Length 95th (ft)	45	76	#265	26	0	#245	226	46	#126	153
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	110	487	110	453	579	340	1536	866	188	1234
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.46	1.75	0.04	0.06	0.75	0.55	0.34	0.59	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
1: SR 41 & Avenue 15

PM 2022 PLUS PROJ
11/05/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	33	40	165	178	18	34	235	778	273	102	476	22
Future Volume (veh/h)	33	40	165	178	18	34	235	778	273	102	476	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	36	43	179	193	20	37	255	846	297	111	517	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	53	53	221	117	380	322	306	1118	507	142	776	36
Arrive On Green	0.03	0.17	0.17	0.07	0.20	0.20	0.17	0.32	0.32	0.08	0.23	0.23
Sat Flow, veh/h	1781	316	1317	1781	1870	1585	1781	3497	1585	1781	3403	158
Grp Volume(v), veh/h	36	0	222	193	20	37	255	846	297	111	265	276
Grp Sat Flow(s),veh/h/ln	1781	0	1633	1781	1870	1585	1781	1749	1585	1781	1749	1812
Q Serve(g_s), s	1.2	0.0	8.0	4.0	0.5	1.2	8.4	13.2	9.6	3.7	8.4	8.5
Cycle Q Clear(g_c), s	1.2	0.0	8.0	4.0	0.5	1.2	8.4	13.2	9.6	3.7	8.4	8.5
Prop In Lane	1.00		0.81	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	53	0	274	117	380	322	306	1118	507	142	399	413
V/C Ratio(X)	0.67	0.00	0.81	1.65	0.05	0.11	0.83	0.76	0.59	0.78	0.66	0.67
Avail Cap(c_a), veh/h	117	0	361	117	414	351	359	1622	735	199	653	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	24.5	28.5	19.6	19.8	24.4	18.6	17.4	27.5	21.4	21.4
Incr Delay (d2), s/veh	13.8	0.0	10.0	328.6	0.1	0.2	13.7	1.2	1.1	12.2	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	3.6	12.3	0.2	0.4	4.1	4.4	3.3	1.9	3.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	0.0	34.4	357.1	19.6	20.0	38.1	19.9	18.5	39.8	23.3	23.3
LnGrp LOS	D	A	C	F	B	B	D	B	B	D	C	C
Approach Vol, veh/h		258			250			1398			652	
Approach Delay, s/veh		35.7			280.2			22.9			26.1	
Approach LOS		D			F			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	26.0	8.7	16.7	15.2	20.4	6.5	18.9
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 6.8	28.3	* 4	13.5	* 12	22.8	* 4	13.5
Max Q Clear Time (g_c+I1), s	5.7	15.2	6.0	10.0	10.4	10.5	3.2	3.2
Green Ext Time (p_c), s	0.0	4.3	0.0	0.3	0.2	1.6	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	50.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: SR 41 & AVE 14 1/2/CO RD 204

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	12	0	0	20	18	1267	68	3	828	2
Future Vol, veh/h	0	0	12	0	0	20	18	1267	68	3	828	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	13	0	0	22	20	1377	74	3	900	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2372	2398	901	2368	2362	1414	902	0	0	1451	0	0
Stage 1	907	907	-	1454	1454	-	-	-	-	-	-	-
Stage 2	1465	1491	-	914	908	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	24	33	337	24	35	169	754	-	-	467	-	-
Stage 1	330	355	-	162	195	-	-	-	-	-	-	-
Stage 2	160	187	-	327	354	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	20	32	337	22	34	169	754	-	-	467	-	-
Mov Cap-2 Maneuver	20	32	-	22	34	-	-	-	-	-	-	-
Stage 1	321	353	-	158	190	-	-	-	-	-	-	-
Stage 2	136	182	-	312	352	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	29.4	0.1	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	754	-	-	337	169	467	-	-
HCM Lane V/C Ratio	0.026	-	-	0.039	0.129	0.007	-	-
HCM Control Delay (s)	9.9	-	-	16.1	29.4	12.8	-	-
HCM Lane LOS	A	-	-	C	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.4	0	-	-

	→	↘	←	↖	↖	↑	↗	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	104	713	91	3	684	1427	108	890	22
v/c Ratio	0.58	0.91	0.50	0.01	0.63	1.17	0.10	0.82	0.04
Control Delay	64.0	37.4	60.0	0.0	38.0	105.9	1.9	44.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	37.4	60.0	0.0	38.0	105.9	1.9	44.1	0.1
Queue Length 50th (ft)	75	276	66	0	228	~1295	0	325	0
Queue Length 95th (ft)	142	#680	124	0	325	#1699	21	435	0
Internal Link Dist (ft)	4434		3123			1138		12757	
Turn Bay Length (ft)		1000		100	650		650		100
Base Capacity (vph)	217	790	257	373	1091	1223	1095	1210	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.90	0.35	0.01	0.63	1.17	0.10	0.74	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	88	7	656	76	7	3	629	1313	99	0	819	20
Future Volume (veh/h)	88	7	656	76	7	3	629	1313	99	0	819	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	96	8	713	83	8	3	684	1427	108	0	890	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	207	17	569	114	11	111	809	1192	1026	2	1293	586
Arrive On Green	0.13	0.13	0.13	0.07	0.07	0.07	0.23	0.65	0.65	0.00	0.37	0.37
Sat Flow, veh/h	1650	138	1585	1632	157	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	104	0	713	91	0	3	684	1427	108	0	890	22
Grp Sat Flow(s),veh/h/ln	1788	0	1585	1789	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	5.8	0.0	13.5	5.4	0.0	0.2	20.4	69.8	2.8	0.0	23.2	1.0
Cycle Q Clear(g_c), s	5.8	0.0	13.5	5.4	0.0	0.2	20.4	69.8	2.8	0.0	23.2	1.0
Prop In Lane	0.92		1.00	0.91		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	0	569	125	0	111	809	1192	1026	2	1293	586
V/C Ratio(X)	0.46	0.00	1.25	0.73	0.00	0.03	0.85	1.20	0.11	0.00	0.69	0.04
Avail Cap(c_a), veh/h	224	0	569	265	0	235	1128	1192	1026	66	1293	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	0.0	34.5	49.2	0.0	46.7	39.4	19.0	7.2	0.0	28.7	21.7
Incr Delay (d2), s/veh	1.5	0.0	127.4	7.9	0.0	0.1	4.4	97.3	0.0	0.0	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	34.6	2.7	0.0	0.1	9.0	58.2	0.9	0.0	9.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	0.0	161.9	57.0	0.0	46.8	43.8	116.3	7.2	0.0	30.3	21.7
LnGrp LOS	D	A	F	E	A	D	D	F	A	A	C	C
Approach Vol, veh/h		817			94			2219			912	
Approach Delay, s/veh		147.1			56.7			88.6			30.1	
Approach LOS		F			E			F			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	76.3		20.0	29.9	46.4		11.5
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		4.0
Max Green Setting (Gmax), s	* 4	69.8		13.5	* 35	38.6		16.0
Max Q Clear Time (g_c+I1), s	0.0	71.8		15.5	22.4	25.2		7.4
Green Ext Time (p_c), s	0.0	0.0		0.0	2.9	3.5		0.2

Intersection Summary	
HCM 6th Ctrl Delay	86.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	91	17	37	0	0	53
Future Vol, veh/h	91	17	37	0	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	18	40	0	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	40	0	-	0	256	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	216	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1570	-	-	-	733	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	820	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1570	-	-	-	687	1031
Mov Cap-2 Maneuver	-	-	-	-	687	-
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	820	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1570	-	-	-	-	1031
HCM Lane V/C Ratio	0.063	-	-	-	-	0.056
HCM Control Delay (s)	7.4	-	-	-	0	8.7
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.2

1: SR 41 & Avenue 15

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	348	275	32	49	99	389	68	34	791
v/c Ratio	0.20	0.79	0.79	0.05	0.07	0.62	0.36	0.10	0.24	0.82
Control Delay	38.7	26.7	47.7	19.2	0.2	55.3	21.8	0.3	39.2	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	26.7	47.7	19.2	0.2	55.3	21.8	0.3	39.2	33.5
Queue Length 50th (ft)	13	57	132	9	0	49	81	0	16	191
Queue Length 95th (ft)	37	#173	#247	31	0	#121	117	0	43	253
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	138	489	386	694	700	159	1220	712	146	1112
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.71	0.71	0.05	0.07	0.62	0.32	0.10	0.23	0.71

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	24	33	273	242	28	43	87	342	60	30	683	12
Future Volume (veh/h)	24	33	273	242	28	43	87	342	60	30	683	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	27	38	310	275	32	49	99	389	68	34	776	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	41	32	265	320	638	541	127	1056	479	49	906	18
Arrive On Green	0.02	0.18	0.18	0.18	0.34	0.34	0.07	0.30	0.30	0.03	0.26	0.26
Sat Flow, veh/h	1781	176	1436	1781	1870	1585	1781	3497	1585	1781	3509	68
Grp Volume(v), veh/h	27	0	348	275	32	49	99	389	68	34	387	404
Grp Sat Flow(s),veh/h/ln	1781	0	1612	1781	1870	1585	1781	1749	1585	1781	1749	1829
Q Serve(g_s), s	1.1	0.0	13.5	11.0	0.8	1.5	4.0	6.4	2.3	1.4	15.4	15.4
Cycle Q Clear(g_c), s	1.1	0.0	13.5	11.0	0.8	1.5	4.0	6.4	2.3	1.4	15.4	15.4
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	41	0	297	320	638	541	127	1056	479	49	452	472
V/C Ratio(X)	0.66	0.00	1.17	0.86	0.05	0.09	0.78	0.37	0.14	0.70	0.86	0.86
Avail Cap(c_a), veh/h	134	0	297	373	638	541	153	1100	498	141	538	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	29.8	29.1	16.1	16.4	33.4	20.0	18.6	35.3	25.8	25.8
Incr Delay (d2), s/veh	16.3	0.0	106.4	16.0	0.0	0.1	18.9	0.2	0.1	16.6	11.3	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	13.8	5.9	0.3	0.5	2.2	2.3	0.8	0.8	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.8	0.0	136.2	45.1	16.2	16.4	52.3	20.3	18.7	51.9	37.1	36.7
LnGrp LOS	D	A	F	D	B	B	D	C	B	D	D	D
Approach Vol, veh/h		375			356			556			825	
Approach Delay, s/veh		130.1			38.6			25.8			37.5	
Approach LOS		F			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	28.6	17.9	20.0	9.9	25.4	6.4	31.5
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 5.8	23.0	* 15	13.5	* 6.3	22.5	* 5.5	23.3
Max Q Clear Time (g_c+I1), s	3.4	8.4	13.0	15.5	6.0	17.4	3.1	3.5
Green Ext Time (p_c), s	0.0	1.6	0.3	0.0	0.0	1.5	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	51.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	17	0	0	24	7	512	23	3	1221	0
Future Vol, veh/h	0	0	17	0	0	24	7	512	23	3	1221	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	18	0	0	26	8	557	25	3	1327	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1932	1931	1327	1928	1919	570	1327	0	0	582	0	0
Stage 1	1333	1333	-	586	586	-	-	-	-	-	-	-
Stage 2	599	598	-	1342	1333	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	50	66	190	50	67	521	520	-	-	992	-	-
Stage 1	190	223	-	496	497	-	-	-	-	-	-	-
Stage 2	488	491	-	188	223	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	47	65	190	45	66	521	520	-	-	992	-	-
Mov Cap-2 Maneuver	47	65	-	45	66	-	-	-	-	-	-	-
Stage 1	187	222	-	489	490	-	-	-	-	-	-	-
Stage 2	456	484	-	169	222	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	12.3	0.2	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	520	-	-	190	521	992	-	-
HCM Lane V/C Ratio	0.015	-	-	0.097	0.05	0.003	-	-
HCM Control Delay (s)	12	-	-	26	12.3	8.6	-	-
HCM Lane LOS	B	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Queues
3: AVENUE 12 & SR 41

AM 2022 PLUS PROJ
11/06/2020

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	785	78	1	497	536	38	1	1324	62
v/c Ratio	0.39	1.08	0.46	0.00	0.63	0.41	0.03	0.02	0.85	0.08
Control Delay	62.7	74.9	59.6	0.0	45.0	10.7	0.1	57.0	36.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	74.9	59.6	0.0	45.0	10.7	0.1	57.0	36.2	0.2
Queue Length 50th (ft)	37	~366	57	0	179	168	0	1	485	0
Queue Length 95th (ft)	80	#764	107	0	243	320	0	7	#652	0
Internal Link Dist (ft)	4434		3885			1138			13157	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	129	729	695	704	788	1320	1174	64	1560	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	1.08	0.11	0.00	0.63	0.41	0.03	0.02	0.85	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	41	4	699	64	5	1	442	477	34	1	1178	55
Future Volume (veh/h)	41	4	699	64	5	1	442	477	34	1	1178	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	46	4	785	72	6	1	497	536	38	1	1324	62
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	133	12	408	118	10	114	608	1106	952	2	1490	675
Arrive On Green	0.08	0.08	0.08	0.07	0.07	0.07	0.18	0.60	0.60	0.00	0.43	0.43
Sat Flow, veh/h	1645	143	1585	1650	138	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	50	0	785	78	0	1	497	536	38	1	1324	62
Grp Sat Flow(s),veh/h/ln	1788	0	1585	1788	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	2.6	0.0	8.0	4.2	0.0	0.1	13.7	16.2	1.0	0.1	34.5	2.3
Cycle Q Clear(g_c), s	2.6	0.0	8.0	4.2	0.0	0.1	13.7	16.2	1.0	0.1	34.5	2.3
Prop In Lane	0.92		1.00	0.92		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	0	408	128	0	114	608	1106	952	2	1490	675
V/C Ratio(X)	0.34	0.00	1.93	0.61	0.00	0.01	0.82	0.48	0.04	0.51	0.89	0.09
Avail Cap(c_a), veh/h	145	0	408	779	0	691	886	1321	1137	72	1754	795
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	0.0	36.7	44.5	0.0	42.5	39.1	11.1	8.1	49.3	26.2	16.9
Incr Delay (d2), s/veh	1.4	0.0	425.8	4.6	0.0	0.0	3.9	0.3	0.0	131.0	5.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	57.8	2.0	0.0	0.0	6.1	6.2	0.3	0.1	13.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	0.0	462.5	49.0	0.0	42.6	43.1	11.4	8.1	180.2	31.5	17.0
LnGrp LOS	D	A	F	D	A	D	D	B	A	F	C	B
Approach Vol, veh/h		835			79			1071			1387	
Approach Delay, s/veh		437.4			48.9			26.0			31.0	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	65.8		14.5	22.1	48.5		13.6				
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		6.5				
Max Green Setting (Gmax), s	* 4	70.8		8.0	* 25	49.5		43.0				
Max Q Clear Time (g_c+I1), s	2.1	18.2		10.0	15.7	36.5		6.2				
Green Ext Time (p_c), s	0.0	2.7		0.0	1.7	5.5		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			130.5
HCM 6th LOS			F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	14	14	2	0	0	68
Future Vol, veh/h	14	14	2	0	0	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	15	2	0	0	74

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2	0	-	0	47	2
Stage 1	-	-	-	-	2	-
Stage 2	-	-	-	-	45	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1620	-	-	-	963	1082
Stage 1	-	-	-	-	1021	-
Stage 2	-	-	-	-	977	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1620	-	-	-	954	1082
Mov Cap-2 Maneuver	-	-	-	-	954	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	977	-

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1620	-	-	-	-	1082
HCM Lane V/C Ratio	0.009	-	-	-	-	0.068
HCM Control Delay (s)	7.2	-	-	-	0	8.6
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2

	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	36	222	193	20	37	255	846	223	111	541
v/c Ratio	0.25	0.60	0.84	0.04	0.07	0.84	0.69	0.32	0.60	0.62
Control Delay	38.0	15.7	64.2	24.3	0.2	56.0	24.4	4.3	48.1	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	15.7	64.2	24.3	0.2	56.0	24.4	4.3	48.1	27.1
Queue Length 50th (ft)	15	17	84	6	0	109	169	0	47	106
Queue Length 95th (ft)	46	80	#220	25	0	#266	257	45	#126	168
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	146	455	231	527	574	305	1334	745	191	1094
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.49	0.84	0.04	0.06	0.84	0.63	0.30	0.58	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
1: SR 41 & Avenue 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	33	40	165	178	18	34	235	778	205	102	476	22
Future Volume (veh/h)	33	40	165	178	18	34	235	778	205	102	476	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	36	43	179	193	20	37	255	846	223	111	517	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	51	52	215	234	497	421	299	1054	478	142	727	34
Arrive On Green	0.03	0.16	0.16	0.13	0.27	0.27	0.17	0.30	0.30	0.08	0.21	0.21
Sat Flow, veh/h	1781	316	1317	1781	1870	1585	1781	3497	1585	1781	3403	158
Grp Volume(v), veh/h	36	0	222	193	20	37	255	846	223	111	265	276
Grp Sat Flow(s),veh/h/ln	1781	0	1633	1781	1870	1585	1781	1749	1585	1781	1749	1812
Q Serve(g_s), s	1.4	0.0	9.1	7.3	0.5	1.2	9.6	15.4	7.9	4.2	9.7	9.7
Cycle Q Clear(g_c), s	1.4	0.0	9.1	7.3	0.5	1.2	9.6	15.4	7.9	4.2	9.7	9.7
Prop In Lane	1.00		0.81	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	51	0	267	234	497	421	299	1054	478	142	373	387
V/C Ratio(X)	0.70	0.00	0.83	0.83	0.04	0.09	0.85	0.80	0.47	0.78	0.71	0.71
Avail Cap(c_a), veh/h	152	0	319	240	497	421	317	1372	622	199	570	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	28.0	29.2	18.8	19.1	27.9	22.2	19.6	31.2	25.2	25.2
Incr Delay (d2), s/veh	15.8	0.0	14.7	20.1	0.0	0.1	18.9	2.7	0.7	12.3	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	4.5	4.3	0.2	0.4	5.1	5.6	2.8	2.1	3.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	0.0	42.7	49.4	18.9	19.2	46.8	24.9	20.3	43.5	27.7	27.6
LnGrp LOS	D	A	D	D	B	B	D	C	C	D	C	C
Approach Vol, veh/h		258			250			1324			652	
Approach Delay, s/veh		43.6			42.5			28.4			30.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	27.3	13.8	17.8	16.3	21.2	6.7	24.8
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 7.7	27.1	* 9.3	13.5	* 12	22.5	* 5.9	16.9
Max Q Clear Time (g_c+I1), s	6.2	17.4	9.3	11.1	11.6	11.7	3.4	3.2
Green Ext Time (p_c), s	0.0	3.4	0.0	0.2	0.1	1.5	0.0	0.1

Intersection Summary			
HCM 6th Ctrl Delay			31.9
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↱		↰	↱	
Traffic Vol, veh/h	0	0	12	0	0	20	18	1199	68	3	828	2
Future Vol, veh/h	0	0	12	0	0	20	18	1199	68	3	828	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	375	-	-	375	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	13	0	0	22	20	1303	74	3	900	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2298	2324	901	2294	2288	1340	902	0	0	1377	0	0
Stage 1	907	907	-	1380	1380	-	-	-	-	-	-	-
Stage 2	1391	1417	-	914	908	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	27	37	337	27	39	187	754	-	-	498	-	-
Stage 1	330	355	-	178	212	-	-	-	-	-	-	-
Stage 2	176	203	-	327	354	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	36	337	25	38	187	754	-	-	498	-	-
Mov Cap-2 Maneuver	23	36	-	25	38	-	-	-	-	-	-	-
Stage 1	321	353	-	173	206	-	-	-	-	-	-	-
Stage 2	151	198	-	312	352	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	26.8	0.1	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	754	-	-	337	187	498	-	-
HCM Lane V/C Ratio	0.026	-	-	0.039	0.116	0.007	-	-
HCM Control Delay (s)	9.9	-	-	16.1	26.8	12.3	-	-
HCM Lane LOS	A	-	-	C	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.4	0	-	-

	→	↘	←	↖	↖	↑	↗	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	104	713	91	3	684	1353	192	890	22
v/c Ratio	0.67	0.94	0.57	0.01	0.60	1.06	0.17	0.78	0.04
Control Delay	82.4	47.5	74.7	0.0	40.4	65.7	1.3	47.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.4	47.5	74.7	0.0	40.4	65.7	1.3	47.9	0.1
Queue Length 50th (ft)	90	331	79	0	251	~1338	0	394	0
Queue Length 95th (ft)	#169	#673	142	0	341	#1701	25	496	0
Internal Link Dist (ft)	4434		3123			1138		12757	
Turn Bay Length (ft)		1000		100	650		650		100
Base Capacity (vph)	178	798	211	316	1241	1273	1161	1176	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.89	0.43	0.01	0.55	1.06	0.17	0.76	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
3: AVE 12 & SR 41

PM 2022 PLUS PROJ
11/06/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	88	7	656	76	7	3	629	1245	177	0	819	20
Future Volume (veh/h)	88	7	656	76	7	3	629	1245	177	0	819	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	96	8	713	83	8	3	684	1353	192	0	890	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	173	14	534	105	10	102	802	1285	1107	1	1503	681
Arrive On Green	0.10	0.10	0.10	0.06	0.06	0.06	0.23	0.70	0.70	0.00	0.43	0.43
Sat Flow, veh/h	1650	138	1585	1632	157	1585	3456	1841	1585	1781	3497	1585
Grp Volume(v), veh/h	104	0	713	91	0	3	684	1353	192	0	890	22
Grp Sat Flow(s),veh/h/ln	1788	0	1585	1789	0	1585	1728	1841	1585	1781	1749	1585
Q Serve(g_s), s	7.1	0.0	13.5	6.4	0.0	0.2	24.4	89.8	5.3	0.0	25.0	1.0
Cycle Q Clear(g_c), s	7.1	0.0	13.5	6.4	0.0	0.2	24.4	89.8	5.3	0.0	25.0	1.0
Prop In Lane	0.92		1.00	0.91		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	188	0	534	115	0	102	802	1285	1107	1	1503	681
V/C Ratio(X)	0.55	0.00	1.33	0.79	0.00	0.03	0.85	1.05	0.17	0.00	0.59	0.03
Avail Cap(c_a), veh/h	188	0	534	223	0	197	1309	1285	1107	55	1503	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	54.7	0.0	42.6	59.3	0.0	56.4	47.3	19.4	6.7	0.0	28.0	21.2
Incr Delay (d2), s/veh	3.5	0.0	163.1	11.3	0.0	0.1	3.1	40.2	0.1	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	40.9	3.3	0.0	0.1	10.8	47.9	1.7	0.0	9.9	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.2	0.0	205.8	70.6	0.0	56.5	50.4	59.6	6.7	0.0	28.7	21.2
LnGrp LOS	E	A	F	E	A	E	D	F	A	A	C	C
Approach Vol, veh/h		817			94			2229			912	
Approach Delay, s/veh		187.0			70.1			52.2			28.5	
Approach LOS		F			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	96.3		20.0	34.5	61.8		12.3
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		4.0
Max Green Setting (Gmax), s	* 4	89.8		13.5	* 49	45.1		16.0
Max Q Clear Time (g_c+I1), s	0.0	91.8		15.5	26.4	27.0		8.4
Green Ext Time (p_c), s	0.0	0.0		0.0	3.5	3.8		0.1

Intersection Summary	
HCM 6th Ctrl Delay	74.5
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	159	17	37	0	0	53
Future Vol, veh/h	159	17	37	0	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	18	40	0	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	40	0	-	0	404	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	364	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1570	-	-	-	603	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	703	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1570	-	-	-	537	1031
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	874	-
Stage 2	-	-	-	-	703	-

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1570	-	-	-	-	1031
HCM Lane V/C Ratio	0.11	-	-	-	-	0.056
HCM Control Delay (s)	7.6	-	-	-	0	8.7
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	-	-	0.2

Queues
AM 2042 PLUS PROJ

1: SR 41 & Avenue 15
11/06/2020

	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	489	256	153	131	108	398	182	256	906
v/c Ratio	0.33	0.96	0.79	0.24	0.13	0.74	0.58	0.26	0.81	0.89
Control Delay	47.4	59.9	58.8	24.0	2.1	70.5	36.3	4.3	55.1	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	59.9	58.8	24.0	2.1	70.5	36.3	4.3	55.1	41.3
Queue Length 50th (ft)	22	245	74	67	0	61	108	0	139	252
Queue Length 95th (ft)	53	#427	#130	114	22	#141	153	39	#240	#327
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	126	520	323	647	1027	146	694	695	347	1080
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.94	0.79	0.24	0.13	0.74	0.57	0.26	0.74	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	35	205	225	225	135	115	95	350	160	225	770	25
Future Volume (veh/h)	35	205	225	225	135	115	95	350	160	225	770	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	40	233	256	256	153	131	108	398	182	256	875	31
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	51	231	254	330	656	819	136	684	461	296	981	35
Arrive On Green	0.03	0.28	0.28	0.10	0.35	0.35	0.08	0.20	0.20	0.17	0.28	0.28
Sat Flow, veh/h	1781	814	895	3456	1870	1585	1781	3497	1585	1781	3445	122
Grp Volume(v), veh/h	40	0	489	256	153	131	108	398	182	256	444	462
Grp Sat Flow(s),veh/h/ln	1781	0	1709	1728	1870	1585	1781	1749	1585	1781	1749	1819
Q Serve(g_s), s	1.9	0.0	24.5	6.2	5.0	3.8	5.1	8.9	7.9	12.1	21.0	21.0
Cycle Q Clear(g_c), s	1.9	0.0	24.5	6.2	5.0	3.8	5.1	8.9	7.9	12.1	21.0	21.0
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	51	0	485	330	656	819	136	684	461	296	498	518
V/C Ratio(X)	0.79	0.00	1.01	0.78	0.23	0.16	0.79	0.58	0.39	0.87	0.89	0.89
Avail Cap(c_a), veh/h	130	0	485	332	656	819	151	709	472	357	557	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	0.0	30.9	38.2	19.8	11.0	39.2	31.5	24.5	35.1	29.6	29.6
Incr Delay (d2), s/veh	22.7	0.0	43.0	11.0	0.2	0.1	22.5	1.1	0.5	17.1	15.4	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	15.5	3.1	2.1	1.3	2.9	3.5	3.0	6.2	10.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.4	0.0	73.9	49.1	20.0	11.1	61.7	32.7	25.1	52.2	45.0	44.5
LnGrp LOS	E	A	F	D	C	B	E	C	C	D	D	D
Approach Vol, veh/h		529			540			688			1162	
Approach Delay, s/veh		73.2			31.6			35.2			46.4	
Approach LOS		E			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	23.4	12.9	31.0	11.3	31.1	7.2	36.8
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 17	17.5	* 8.3	24.5	* 7.3	27.5	* 6.3	26.5
Max Q Clear Time (g_c+I1), s	14.1	10.9	8.2	26.5	7.1	23.0	3.9	7.0
Green Ext Time (p_c), s	0.3	1.4	0.0	0.0	0.0	1.6	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱	↰	↑↑	↑↱	
Traffic Vol, veh/h	0	20	10	620	1230	45
Future Vol, veh/h	0	20	10	620	1230	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	375	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	11	674	1337	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	693	1386	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	386	490	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	386	490	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	14.9		0.2		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	490	-	386	-	-
HCM Lane V/C Ratio	0.022	-	0.056	-	-
HCM Control Delay (s)	12.5	-	14.9	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	180	1152	146	79	657	539	163	22	1253	96
v/c Ratio	1.05	1.40	0.65	0.25	0.83	0.27	0.17	0.26	1.02	0.15
Control Delay	136.9	209.4	64.9	1.9	54.9	15.0	2.8	64.8	71.5	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.9	209.4	64.9	1.9	54.9	15.0	2.8	64.8	71.5	1.8
Queue Length 50th (ft)	~155	~1065	111	0	255	118	0	17	~553	0
Queue Length 95th (ft)	#313	#1379	179	0	#357	167	34	46	#727	12
Internal Link Dist (ft)	4434		3885			1138			13157	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	171	820	643	649	796	1982	973	88	1223	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.40	0.23	0.12	0.83	0.27	0.17	0.25	1.02	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	80	80	1025	50	80	70	585	480	145	20	1115	85
Future Volume (veh/h)	80	80	1025	50	80	70	585	480	145	20	1115	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	90	90	1152	56	90	79	657	539	163	22	1253	96
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	91	91	499	72	116	163	743	1992	903	31	1301	589
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.22	0.57	0.57	0.02	0.37	0.37
Sat Flow, veh/h	912	912	1585	704	1131	1585	3456	3497	1585	1781	3497	1585
Grp Volume(v), veh/h	180	0	1152	146	0	79	657	539	163	22	1253	96
Grp Sat Flow(s),veh/h/ln	1825	0	1585	1835	0	1585	1728	1749	1585	1781	1749	1585
Q Serve(g_s), s	11.3	0.0	11.5	8.9	0.0	5.4	21.2	9.0	5.7	1.4	40.3	4.7
Cycle Q Clear(g_c), s	11.3	0.0	11.5	8.9	0.0	5.4	21.2	9.0	5.7	1.4	40.3	4.7
Prop In Lane	0.50		1.00	0.38		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	0	499	189	0	163	743	1992	903	31	1301	589
V/C Ratio(X)	0.99	0.00	2.31	0.77	0.00	0.49	0.88	0.27	0.18	0.70	0.96	0.16
Avail Cap(c_a), veh/h	182	0	499	686	0	592	850	1992	903	94	1307	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	0.0	39.4	50.3	0.0	48.7	43.8	12.6	11.9	56.2	35.4	24.2
Incr Delay (d2), s/veh	62.7	0.0	594.4	6.6	0.0	2.2	10.0	0.1	0.1	24.9	16.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	96.3	4.4	0.0	2.2	10.0	3.5	2.0	0.8	18.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.4	0.0	633.8	57.0	0.0	51.0	53.7	12.7	12.0	81.1	52.2	24.3
LnGrp LOS	F	A	F	E	A	D	D	B	B	F	D	C
Approach Vol, veh/h		1332			225			1359			1371	
Approach Delay, s/veh		563.6			54.9			32.4			50.7	
Approach LOS		F			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.7	72.0		18.0	29.5	49.3		18.3
Change Period (Y+Rc), s	* 4.7	6.5		6.5	* 4.7	6.5		6.5
Max Green Setting (Gmax), s	* 6.1	65.2		11.5	* 28	43.0		43.0
Max Q Clear Time (g_c+I1), s	3.4	11.0		13.5	23.2	42.3		10.9
Green Ext Time (p_c), s	0.0	3.6		0.0	1.6	0.4		0.9

Intersection Summary	
HCM 6th Ctrl Delay	204.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	240	20	5	25	5	190
Future Vol, veh/h	240	20	5	25	5	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	261	22	5	27	5	207

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	32	0	-	0	563	19
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	544	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1580	-	-	-	487	1059
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1580	-	-	-	407	1059
Mov Cap-2 Maneuver	-	-	-	-	407	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	582	-

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1580	-	-	-	407	1059
HCM Lane V/C Ratio	0.165	-	-	-	0.013	0.195
HCM Control Delay (s)	7.7	-	-	-	14	9.2
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0	0.7

	↗	→	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	65	565	658	457	527	321	918	484	609	282
v/c Ratio	0.68	1.35	1.35	0.77	0.53	0.85	1.15	0.69	1.38	0.31
Control Delay	102.0	214.1	217.9	56.6	17.1	76.6	132.2	36.0	227.9	45.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	214.1	217.9	56.6	17.1	76.6	132.2	36.0	227.9	45.5
Queue Length 50th (ft)	64	~713	~432	406	253	304	~553	329	~789	114
Queue Length 95th (ft)	#137	#952	#559	545	354	397	#690	467	#1028	168
Internal Link Dist (ft)		2491		2072			2608			1268
Turn Bay Length (ft)	115		200		200	525		350	450	
Base Capacity (vph)	99	419	487	592	988	470	798	701	440	913
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.35	1.35	0.77	0.53	0.68	1.15	0.69	1.38	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
1: SR 41 & Avenue 15

PM 2042 PLUS PROJ
11/06/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰↰	↑	↱	↰	↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	60	360	160	605	420	485	295	845	445	560	235	25
Future Volume (veh/h)	60	360	160	605	420	485	295	845	445	560	235	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1841
Adj Flow Rate, veh/h	65	391	174	658	457	527	321	918	484	609	255	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	4
Cap, veh/h	82	282	126	491	609	911	349	804	590	443	903	95
Arrive On Green	0.05	0.23	0.23	0.14	0.33	0.33	0.20	0.23	0.23	0.25	0.28	0.28
Sat Flow, veh/h	1781	1226	546	3456	1870	1585	1781	3497	1585	1781	3194	335
Grp Volume(v), veh/h	65	0	565	658	457	527	321	918	484	609	139	143
Grp Sat Flow(s),veh/h/ln	1781	0	1772	1728	1870	1585	1781	1749	1585	1781	1749	1780
Q Serve(g_s), s	5.4	0.0	34.5	21.3	32.7	31.8	26.5	34.5	34.5	37.3	9.3	9.4
Cycle Q Clear(g_c), s	5.4	0.0	34.5	21.3	32.7	31.8	26.5	34.5	34.5	37.3	9.3	9.4
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	82	0	408	491	609	911	349	804	590	443	494	503
V/C Ratio(X)	0.79	0.00	1.39	1.34	0.75	0.58	0.92	1.14	0.82	1.37	0.28	0.28
Avail Cap(c_a), veh/h	100	0	408	491	609	911	474	804	590	443	494	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.8	0.0	57.8	64.3	45.1	20.3	59.2	57.7	42.6	56.3	41.9	42.0
Incr Delay (d2), s/veh	28.5	0.0	188.4	166.7	5.2	0.9	19.1	78.2	9.0	182.5	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	36.8	20.8	16.1	11.9	13.4	23.4	17.7	38.5	3.9	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.4	0.0	246.2	231.0	50.3	21.3	78.3	136.0	51.6	238.8	42.2	42.3
LnGrp LOS	F	A	F	F	D	C	E	F	D	F	D	D
Approach Vol, veh/h		630			1642			1723			891	
Approach Delay, s/veh		231.0			113.4			101.5			176.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.0	41.0	26.0	41.0	34.1	48.9	11.6	55.4
Change Period (Y+Rc), s	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5	* 4.7	6.5
Max Green Setting (Gmax), s	* 37	34.5	* 21	34.5	* 40	31.9	* 8.4	47.4
Max Q Clear Time (g_c+I1), s	39.3	36.5	23.3	36.5	28.5	11.4	7.4	34.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.9	0.9	0.0	4.0

Intersection Summary	
HCM 6th Ctrl Delay	135.9
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

2: SR 41 & AVE 14 1/2

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱	↰	↑↑	↑↱	
Traffic Vol, veh/h	0	15	10	1560	1085	10
Future Vol, veh/h	0	15	10	1560	1085	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	375	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	11	1696	1179	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	595	1190	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	447	582	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	447	582	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	13.4		0.1		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	582	-	447	-	-
HCM Lane V/C Ratio	0.019	-	0.036	-	-
HCM Control Delay (s)	11.3	-	13.4	-	-
HCM Lane LOS	B	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

	→	↘	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	429	870	631	130	1179	1315	353	98	995	71
v/c Ratio	1.47	1.36	1.49	0.27	1.70	0.96	0.42	0.95	1.14	0.14
Control Delay	270.1	197.5	270.2	6.2	356.3	59.0	4.3	142.7	124.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	270.1	197.5	270.2	6.2	356.3	59.0	4.3	142.7	124.7	0.6
Queue Length 50th (ft)	~554	~1028	~820	0	~840	632	0	94	~575	0
Queue Length 95th (ft)	#769	#1323	#1059	42	#976	#788	63	#214	#713	0
Internal Link Dist (ft)	4434		3123			1138			12757	
Turn Bay Length (ft)		1000		100	650		650	260		100
Base Capacity (vph)	292	638	424	482	693	1371	839	103	873	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.47	1.36	1.49	0.27	1.70	0.96	0.42	0.95	1.14	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	245	150	800	340	240	120	1085	1210	325	90	915	65
Future Volume (veh/h)	245	150	800	340	240	120	1085	1210	325	90	915	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1841	1870	1870	1841	1870
Adj Flow Rate, veh/h	266	163	870	370	261	130	1179	1315	353	98	995	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	4	2	2	4	2
Cap, veh/h	182	112	577	250	176	372	698	1382	626	104	880	399
Arrive On Green	0.16	0.16	0.16	0.23	0.23	0.23	0.20	0.40	0.40	0.06	0.25	0.25
Sat Flow, veh/h	1125	689	1585	1065	752	1585	3456	3497	1585	1781	3497	1585
Grp Volume(v), veh/h	429	0	870	631	0	130	1179	1315	353	98	995	71
Grp Sat Flow(s),veh/h/ln	1814	0	1585	1817	0	1585	1728	1749	1585	1781	1749	1585
Q Serve(g_s), s	23.5	0.0	23.5	34.0	0.0	9.9	29.3	52.8	25.1	7.9	36.5	5.1
Cycle Q Clear(g_c), s	23.5	0.0	23.5	34.0	0.0	9.9	29.3	52.8	25.1	7.9	36.5	5.1
Prop In Lane	0.62		1.00	0.59		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	0	577	426	0	372	698	1382	626	104	880	399
V/C Ratio(X)	1.46	0.00	1.51	1.48	0.00	0.35	1.69	0.95	0.56	0.94	1.13	0.18
Avail Cap(c_a), veh/h	294	0	577	426	0	372	698	1382	626	104	880	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.8	0.0	46.1	55.5	0.0	46.3	57.8	42.5	34.1	68.0	54.3	42.5
Incr Delay (d2), s/veh	224.5	0.0	237.2	228.7	0.0	0.6	316.0	14.3	1.2	68.4	72.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.2	0.0	58.7	42.6	0.0	4.0	43.4	25.4	9.9	5.5	24.3	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	285.3	0.0	283.3	284.2	0.0	46.8	373.8	56.8	35.3	136.4	127.1	42.7
LnGrp LOS	F	A	F	F	A	D	F	E	D	F	F	D
Approach Vol, veh/h		1299			761			2847			1164	
Approach Delay, s/veh		284.0			243.7			185.4			122.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	13.2	63.8	30.0	34.0	43.0	38.0
Change Period (Y+Rc), s	* 4.7	6.5	6.5	* 4.7	6.5	4.0
Max Green Setting (Gmax), s	* 8.5	57.3	23.5	* 29	36.5	34.0
Max Q Clear Time (g_c+I1), s	9.9	54.8	25.5	31.3	38.5	36.0
Green Ext Time (p_c), s	0.0	1.9	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	201.8
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	17.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↱		↰	↱
Traffic Vol, veh/h	545	20	40	35	70	720
Future Vol, veh/h	545	20	40	35	70	720
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	592	22	43	38	76	783

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	1268	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	1206	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1517	-	-	-	186	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	283	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1517	-	-	-	113	1003
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	283	-

Approach	EB	WB	SB
HCM Control Delay, s	8.6	0	25.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1517	-	-	-	113	1003
HCM Lane V/C Ratio	0.391	-	-	-	0.673	0.78
HCM Control Delay (s)	8.9	-	-	-	86.1	20
HCM Lane LOS	A	-	-	-	F	C
HCM 95th %tile Q(veh)	1.9	-	-	-	3.5	8.2

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 SR 41 NORTHBOUND
From/To                 AVE 12 TO RD 204
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  447     veh/h
Opposing direction volume, Vo  953     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.2                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         492     pc/h        1036    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.2     mi/h
Average travel speed, ATSd                     46.5    mi/h
Percent Free Flow Speed, PFFS                  78.1    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         486    pc/h         1036    pc/h
Base percent time-spent-following,(note-4) BPTSFd  56.8   %
Adjustment for no-passing zones, fnp               21.6
Percent time-spent-following, PTSFd                63.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              C
Volume to capacity ratio, v/c                      0.29
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      46.5    mi/h
Percent time-spent-following, PTSFd (from above)             63.7
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            485.9
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.64
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 SR 41 NORTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  468     veh/h
Opposing direction volume, Vo  944     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.2                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.988               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         515     pc/h        1026    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.2     mi/h
Average travel speed, ATSd                     46.4    mi/h
Percent Free Flow Speed, PFFS                  77.9    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         509    pc/h         1026    pc/h
Base percent time-spent-following,(note-4) BPTSFd  58.2   %
Adjustment for no-passing zones, fnp               22.0
Percent time-spent-following, PTSFd                65.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.30
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      46.4    mi/h
Percent time-spent-following, PTSFd (from above)             65.5
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            508.7
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.64
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                        HCS 2010: Two-Lane Highways Release 6.50




Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  kda
Agency/Co.
Date Performed           11/9/2020
Analysis Time Period     AM
Highway                  SR 41 SOUTHBOUND
From/To                  RD 204 TO AVE 15
Jurisdiction
Analysis Year            2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  944     veh/h
Opposing direction volume, Vo  468     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.2
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               0.988
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         1026    pc/h        515     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           2.8     mi/h
Average travel speed, ATSd                     44.8    mi/h
Percent Free Flow Speed, PFFS                  75.3    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         1026   pc/h         509     pc/h
Base percent time-spent-following,(note-4) BPTSFd  74.8   %
Adjustment for no-passing zones, fnp               22.0
Percent time-spent-following, PTSFd                89.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.60
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1680    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1680    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      44.8    mi/h
Percent time-spent-following, PTSFd (from above)             89.5
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1026.1
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.00
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50





Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 SR 41 SOUTHBOUND
From/To                 AVE 12 TO RD 204
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  953     veh/h
Opposing direction volume, Vo  447     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.2
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               0.988
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         1036    pc/h        492     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA       0.5     mi/h

Free-flow speed, FFSd                           59.5    mi/h

Adjustment for no-passing zones, fnp            3.0     mi/h
Average travel speed, ATSd                      44.7    mi/h
Percent Free Flow Speed, PFFS                   75.1    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         1036   pc/h         486     pc/h
Base percent time-spent-following,(note-4) BPTSFd  75.3   %
Adjustment for no-passing zones, fnp               21.6
Percent time-spent-following, PTSFd                90.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.61
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1680    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1680    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      44.7    mi/h
Percent time-spent-following, PTSFd (from above)             90.0
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1035.9
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.00
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 NORTHBOUND
From/To                 AVE 12 TO RD 204
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft    % Trucks and buses       6       %
Lane width           12.0    ft    % Trucks crawling        0.0     %
Segment length       0.0     mi    Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi    % No-passing zones       100     %
        Up/down      -       %     Access point density     2       /mi

Analysis direction volume, Vd  1049    veh/h
Opposing direction volume, Vo  629     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               0.994
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         1140    pc/h        688     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                            59.5    mi/h

Adjustment for no-passing zones, fnp             1.7     mi/h
Average travel speed, ATSd                       43.6    mi/h
Percent Free Flow Speed, PFFS                    73.3    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         1140   pc/h         684     pc/h
Base percent time-spent-following,(note-4) BPTSFd  78.8   %
Adjustment for no-passing zones, fnp               19.4
Percent time-spent-following, PTSFd                90.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.67
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      43.6    mi/h
Percent time-spent-following, PTSFd (from above)             90.9
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1140.2
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.05
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50




Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 NORTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  990     veh/h
Opposing direction volume, Vo  624     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               0.994
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         1076    pc/h        682     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                            59.5    mi/h

Adjustment for no-passing zones, fnp             1.7     mi/h
Average travel speed, ATSd                       44.1    mi/h
Percent Free Flow Speed, PFFS                    74.1    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                                 Analysis(d)         Opposing (o)
PCE for trucks, ET                            1.0                 1.0
PCE for RVs, ER                               1.0                 1.0
Heavy-vehicle adjustment factor, fHV          1.000               1.000
Grade adjustment factor,(note-1) fg           1.00                1.00
Directional flow rate,(note-2) vi             1076   pc/h         678     pc/h
Base percent time-spent-following,(note-4) BPTSFd  77.6   %
Adjustment for no-passing zones, fnp               20.9
Percent time-spent-following, PTSFd                90.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.63
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1690    veh/h

_____________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      44.1    mi/h
Percent time-spent-following, PTSFd (from above)             90.4
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1076.1
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.02
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 SOUTHBOUND
From/To                 AVE 12 TO RD 204
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft    % Trucks and buses       6       %
Lane width           12.0    ft    % Trucks crawling        0.0     %
Segment length       0.0     mi    Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi    % No-passing zones       100     %
        Up/down      -       %     Access point density     2       /mi

Analysis direction volume, Vd  629     veh/h
Opposing direction volume, Vo  1049    veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         688     pc/h        1140    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.1     mi/h
Average travel speed, ATSd                     44.2    mi/h
Percent Free Flow Speed, PFFS                  74.3    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.0                1.0
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         684    pc/h        1140    pc/h
Base percent time-spent-following,(note-4) BPTSFd  68.1   %
Adjustment for no-passing zones, fnp               19.4
Percent time-spent-following, PTSFd                75.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.40
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      44.2    mi/h
Percent time-spent-following, PTSFd (from above)             75.4
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            683.7
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.79
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50





Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 SOUTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2019
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft    % Trucks and buses       6       %
Lane width           12.0    ft    % Trucks crawling        0.0     %
Segment length       0.0     mi    Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  4       %
Grade:  Length       -       mi    % No-passing zones       100     %
        Up/down      -       %     Access point density     2       /mi

Analysis direction volume, Vd  624     veh/h
Opposing direction volume, Vo  990     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         682     pc/h        1076    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                           59.5    mi/h

Adjustment for no-passing zones, fnp            1.2     mi/h
Average travel speed, ATSd                      44.7    mi/h
Percent Free Flow Speed, PFFS                   75.1    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         678    pc/h         1076    pc/h
Base percent time-spent-following,(note-4) BPTSFd  67.4   %
Adjustment for no-passing zones, fnp               20.9
Percent time-spent-following, PTSFd                75.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.40
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      44.7    mi/h
Percent time-spent-following, PTSFd (from above)             75.5
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                         55
Percent of segment with occupied on-highway parking            0
Pavement rating, P                                             3
Flow rate in outside lane, vOL                                 678.3
Effective width of outside lane, We                            24.00
Effective speed factor, St                                     4.79
Bicycle LOS Score, BLOS                                        3.79
Bicycle LOS                                                    D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 AVE 12
From/To                 SR 41 TO RMB WB
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  86      veh/h
Opposing direction volume, Vo  184     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.9                1.5
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.949              0.971
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi         99      pc/h       206     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA       0.5     mi/h

Free-flow speed, FFSd                           59.5    mi/h

Adjustment for no-passing zones, fnp            4.2     mi/h
Average travel speed, ATSd                      53.0    mi/h
Percent Free Flow Speed, PFFS                   89.0    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         94     pc/h         201     pc/h
Base percent time-spent-following,(note-4) BPTSFd  11.0   %
Adjustment for no-passing zones, fnp               50.0
Percent time-spent-following, PTSFd                26.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              B
Volume to capacity ratio, v/c                      0.06
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1651    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1651    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      53.0    mi/h
Percent time-spent-following, PTSFd (from above)             26.9
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            93.5
Effective width of outside lane, We                       34.26
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   -0.21
Bicycle LOS                                               A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50






Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period
Highway                 AVE 12
From/To                 SR 41 TO RMB WB
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  70      veh/h
Opposing direction volume, Vo  39      veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.9                 1.9
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.949               0.949
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         80      pc/h        45      pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           2.9     mi/h
Average travel speed, ATSd                     55.7    mi/h
Percent Free Flow Speed, PFFS                  93.5    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         77     pc/h         43      pc/h
Base percent time-spent-following,(note-4) BPTSFd  9.1    %
Adjustment for no-passing zones, fnp               51.6
Percent time-spent-following, PTSFd                42.2   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              B
Volume to capacity ratio, v/c                      0.05
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1613    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1613    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      55.7    mi/h
Percent time-spent-following, PTSFd (from above)             42.2
Level of service, LOSd (from above)                          B

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            76.1
Effective width of outside lane, We                       35.70
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   -0.81
Bicycle LOS                                               A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 AVE 12
From/To                 SR 41 TO RMB EB
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  39      veh/h
Opposing direction volume, Vo  70      veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.9                 1.9
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.949               0.949
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         45      pc/h        80      pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                           59.5    mi/h

Adjustment for no-passing zones, fnp            2.9     mi/h
Average travel speed, ATSd                      55.7    mi/h
Percent Free Flow Speed, PFFS                   93.5    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.1                1.1
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adjustment factor, fHV      0.994              0.994
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         43     pc/h        77      pc/h
Base percent time-spent-following,(note-4) BPTSFd  5.3    %
Adjustment for no-passing zones, fnp               51.6
Percent time-spent-following, PTSFd                23.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              A
Volume to capacity ratio, v/c                      0.03
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1613    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1613    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      55.7    mi/h
Percent time-spent-following, PTSFd (from above)             23.8
Level of service, LOSd (from above)                          A

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            42.4
Effective width of outside lane, We                       38.49
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   -2.15
Bicycle LOS                                               A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  kda
Agency/Co.
Date Performed           11/9/2020
Analysis Time Period     PM
Highway                  AVE 12
From/To                  SR 41 TO RMB EB
Jurisdiction
Analysis Year            2022 WITH RNB
Description  RMB EIR

__________________________________Input Data___________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  184     veh/h
Opposing direction volume, Vo  86      veh/h

____________________________Average Travel Speed______________________________

Direction                              Analysis(d)         Opposing (o)
PCE for trucks, ET                         1.5                 1.9
PCE for RVs, ER                            1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV     0.971               0.949
Grade adj. factor,(note-1) fg              1.00                1.00
Directional flow rate,(note-2) vi          206     pc/h        99      pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                            59.5    mi/h

Adjustment for no-passing zones, fnp             2.9     mi/h
Average travel speed, ATSd                       54.3    mi/h
Percent Free Flow Speed, PFFS                    91.2    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         201    pc/h         94      pc/h
Base percent time-spent-following,(note-4) BPTSFd  21.6   %
Adjustment for no-passing zones, fnp               50.0
Percent time-spent-following, PTSFd                55.7   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              C
Volume to capacity ratio, v/c                      0.12
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1613    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1613    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      54.3    mi/h
Percent time-spent-following, PTSFd (from above)             55.7
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            200.0
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.17
Bicycle LOS                                               C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50




Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis_________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 SR 41 NORTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data___________________________________

Highway class  Class 1            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  519     veh/h
Opposing direction volume, Vo  1234    veh/h

____________________________Average Travel Speed_______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         568     pc/h        1341    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                           59.5    mi/h

Adjustment for no-passing zones, fnp            1.0     mi/h
Average travel speed, ATSd                      43.7    mi/h
Percent Free Flow Speed, PFFS                   73.5    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.0                1.0
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adjustment factor, fHV      1.000              1.000
Grade adjustment factor,(note-1) fg       1.00               1.00
Directional flow rate,(note-2) vi         564    pc/h        1341    pc/h
Base percent time-spent-following,(note-4) BPTSFd  64.7   %
Adjustment for no-passing zones, fnp               15.7
Percent time-spent-following, PTSFd                69.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.33
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      43.7    mi/h
Percent time-spent-following, PTSFd (from above)             69.3
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            564.1
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.70
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                        HCS 2010: Two-Lane Highways Release 6.50







Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  kda
Agency/Co.
Date Performed           11/9/2020
Analysis Time Period     AM
Highway                  SR 41 SOUTHBOUND
From/To                  RD 204 TO AVE 15
Jurisdiction
Analysis Year            2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  1234    veh/h
Opposing direction volume, Vo  519     veh/h

____________________________Average Travel Speed______________________________

Direction                              Analysis(d)         Opposing (o)
PCE for trucks, ET                         1.0                 1.1
PCE for RVs, ER                            1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV     1.000               0.994
Grade adj. factor,(note-1) fg              1.00                1.00
Directional flow rate,(note-2) vi          1341    pc/h        568     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                 -      mi/h
Observed total demand,(note-3) V                   -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS   0.0     mi/h
Adj. for access point density,(note-3) fA       0.5     mi/h

Free-flow speed, FFSd                            59.5    mi/h

Adjustment for no-passing zones, fnp             2.3     mi/h
Average travel speed, ATSd                       42.4    mi/h
Percent Free Flow Speed, PFFS                    71.3    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         1341   pc/h         564     pc/h
Base percent time-spent-following,(note-4) BPTSFd  82.7   %
Adjustment for no-passing zones, fnp               15.7
Percent time-spent-following, PTSFd                93.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.79
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      42.4    mi/h
Percent time-spent-following, PTSFd (from above)             93.8
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1341.3
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.14
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50




Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 NORTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       6.0     ft      % Trucks and buses       6       %
Lane width           12.0    ft      % Trucks crawling        0.0     %
Segment length       0.0     mi      Truck crawl speed        0.0     mi/hr
Terrain type         Level           % Recreational vehicles  4       %
Grade:  Length       -       mi      % No-passing zones       100     %
        Up/down      -       %       Access point density     2       /mi

Analysis direction volume, Vd  1336    veh/h
Opposing direction volume, Vo  839     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         1452    pc/h        912     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.3     mi/h
Average travel speed, ATSd                     39.9    mi/h
Percent Free Flow Speed, PFFS                  67.0    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         1452   pc/h         912     pc/h
Base percent time-spent-following,(note-4) BPTSFd  86.4   %
Adjustment for no-passing zones, fnp               13.2
Percent time-spent-following, PTSFd                94.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.85
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      39.9    mi/h
Percent time-spent-following, PTSFd (from above)             94.5
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            1452.2
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   4.18
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 SR 41 SOUTHBOUND
From/To                 RD 204 TO AVE 15
Jurisdiction
Analysis Year           2022 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1            Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  839     veh/h
Opposing direction volume, Vo  1336    veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    1.000               1.000
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         912     pc/h        1452    pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           0.8     mi/h
Average travel speed, ATSd                     40.3    mi/h
Percent Free Flow Speed, PFFS                  67.7    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         912    pc/h         1452    pc/h
Base percent time-spent-following,(note-4) BPTSFd  79.4   %
Adjustment for no-passing zones, fnp               13.2
Percent time-spent-following, PTSFd                84.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.54
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1700    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1700    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      40.3    mi/h
Percent time-spent-following, PTSFd (from above)             84.5
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            912.0
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.94
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                      HCS 2010: Two-Lane Highways Release 6.50




Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    AM
Highway                 AVE 12
From/To                 SR 41 TO RMB WB
Jurisdiction
Analysis Year           2042 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  200     veh/h
Opposing direction volume, Vo  245     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.5                 1.4
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.971               0.977
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         224     pc/h        273     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           4.0     mi/h
Average travel speed, ATSd                     51.6    mi/h
Percent Free Flow Speed, PFFS                  86.7    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         219    pc/h         268     pc/h
Base percent time-spent-following,(note-4) BPTSFd  25.5   %
Adjustment for no-passing zones, fnp               58.7
Percent time-spent-following, PTSFd                51.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              C
Volume to capacity ratio, v/c                      0.13
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1661    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1661    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      51.6    mi/h
Percent time-spent-following, PTSFd (from above)             51.9
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            217.4
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.21
Bicycle LOS                                               C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 AVE 12
From/To
Jurisdiction
Analysis Year           2042 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  700     veh/h
Opposing direction volume, Vo  565     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994               0.994
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         765     pc/h        618     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM              -      mi/h
Observed total demand,(note-3) V                -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.9     mi/h
Average travel speed, ATSd                     46.8    mi/h
Percent Free Flow Speed, PFFS                  78.7    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         761    pc/h         614     pc/h
Base percent time-spent-following,(note-4) BPTSFd  65.7   %
Adjustment for no-passing zones, fnp               28.6
Percent time-spent-following, PTSFd                81.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.45
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      46.8    mi/h
Percent time-spent-following, PTSFd (from above)             81.5
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            760.9
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.85
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                        HCS 2010: Two-Lane Highways Release 6.50






Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  kda
Agency/Co.
Date Performed           11/9/2020
Analysis Time Period     AM
Highway                  AVE 12
From/To                  SR 41 TO RMB EB
Jurisdiction
Analysis Year            2042 WITH RNB
Description  RMB EIR

__________________________________Input Data___________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  245     veh/h
Opposing direction volume, Vo  200     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.4                1.5
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.977              0.971
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi         273     pc/h       224     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS    0.0     mi/h
Adj. for access point density,(note-3) fA        0.5     mi/h

Free-flow speed, FFSd                            59.5    mi/h

Adjustment for no-passing zones, fnp             4.1     mi/h
Average travel speed, ATSd                       51.5    mi/h
Percent Free Flow Speed, PFFS                    86.6    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      0.994               0.994
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         268    pc/h         219     pc/h
Base percent time-spent-following,(note-4) BPTSFd  28.5   %
Adjustment for no-passing zones, fnp               58.7
Percent time-spent-following, PTSFd                60.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              C
Volume to capacity ratio, v/c                      0.16
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1651    veh/h
Capacity from PTSF, CdPTSF                         1690    veh/h
Directional Capacity                               1651    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      51.5    mi/h
Percent time-spent-following, PTSFd (from above)             60.8
Level of service, LOSd (from above)                          C

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking      0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            266.3
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.32
Bicycle LOS                                               C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 kda
Agency/Co.
Date Performed          11/9/2020
Analysis Time Period    PM
Highway                 AVE 12
From/To                 SR 41 TO RMB EB
Jurisdiction
Analysis Year           2042 WITH RNB
Description  RMB EIR

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.92
Shoulder width       6.0     ft     % Trucks and buses       6       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  4       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     2       /mi

Analysis direction volume, Vd  565     veh/h
Opposing direction volume, Vo  700     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.1                 1.1
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.994               0.994
Grade adj. factor,(note-1) fg             1.00                1.00
Directional flow rate,(note-2) vi         618     pc/h        765     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM               -      mi/h
Observed total demand,(note-3) V                 -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS             60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.5     mi/h

Free-flow speed, FFSd                          59.5    mi/h

Adjustment for no-passing zones, fnp           1.5     mi/h
Average travel speed, ATSd                     47.3    mi/h
Percent Free Flow Speed, PFFS                  79.4    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                             Analysis(d)         Opposing (o)
PCE for trucks, ET                        1.0                 1.0
PCE for RVs, ER                           1.0                 1.0
Heavy-vehicle adjustment factor, fHV      1.000               1.000
Grade adjustment factor,(note-1) fg       1.00                1.00
Directional flow rate,(note-2) vi         614    pc/h         761     pc/h
Base percent time-spent-following,(note-4) BPTSFd  61.1   %
Adjustment for no-passing zones, fnp               28.6
Percent time-spent-following, PTSFd                73.9   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.36
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               1690    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      47.3    mi/h
Percent time-spent-following, PTSFd (from above)             73.9
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -
Percent free flow speed including passing lane, PFFSpl       0.0     %

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     E
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

```
Posted speed limit, Sp                                    55
Percent of segment with occupied on-highway parking       0
Pavement rating, P                                        3
Flow rate in outside lane, vOL                            614.1
Effective width of outside lane, We                       24.00
Effective speed factor, St                                4.79
Bicycle LOS Score, BLOS                                   3.74
Bicycle LOS                                               D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain
   is one of the base conditions. For the purpose of grade adjustment, specific
   dewngrade segments are treated as level terrain.
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a
   specific downgrade.
```

```
                    HCS 2010: Multilane Highways Release 6.50




Phone:                                     Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:         KDA
Agency/Co:
Date:            11/9/2020
Analysis Period: AM
Highway:         SR 41
From/To:         NORTH OF AVE 15
Jurisdiction:
Analysis Year:   2042 PMB
Project ID:

_______________________________FREE-FLOW SPEED_________________________________

                   Direction           1                  2
Lane width                           12.0      ft       12.0      ft
Lateral clearance:
     Right edge                      6.0       ft       6.0       ft
     Left edge                       6.0       ft       6.0       ft
     Total lateral clearance         12.0      ft       12.0      ft
Access points per mile               1                  1
Median type                          Divided            Divided
Free-flow speed:                     Base               Base
     FFS or BFFS                     60.0      mph      60.0      mph
Lane width adjustment, FLW           0.0       mph      0.0       mph
Lateral clearance adjustment, FLC    0.0       mph      0.0       mph
Median type adjustment, FM           0.0       mph      0.0       mph
Access points adjustment, FA         0.3       mph      0.3       mph
Free-flow speed                      59.8      mph      59.8      mph

____________________________________VOLUME_____________________________________

                   Direction           1                  2
Volume, V                            500       vph      1020      vph
Peak-hour factor, PHF                0.92               0.92
Peak 15-minute volume, v15           136                277
Trucks and buses                     5         %        5         %
Recreational vehicles                4         %        4         %
Terrain type                         Level              Level
    Grade                            0.00      %        0.00      %
    Segment length                   0.00      mi       0.00      mi
Number of lanes                      2                  2
Driver population adjustment, fP     1.00               1.00
Trucks and buses PCE, ET             1.5                1.5
Recreational vehicles PCE, ER        1.2                1.2
Heavy vehicle adjustment, fHV        0.968              0.968
Flow rate, vp                        280       pcphpl   572       pcphpl

____________________________________RESULTS____________________________________
```

```
                   Direction          1                  2
Flow rate, vp                        280       pcphpl   572       pcphpl
Free-flow speed, FFS                 59.8      mph      59.8      mph
Avg. passenger-car travel speed, S   60.0      mph      60.0      mph
Level of service, LOS                A                  A
Density, D                           4.7       pc/mi/ln 9.5       pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp               55                 55
Percent of segment with occupied
on-highway parking                   0                  0
Pavement rating, P                   3                  3
Flow rate in outside lane, vOL       271.7              554.3
Effective width of outside lane, We  24.00              24.00
Effective speed factor, St           4.79               4.79
Bicycle LOS Score, BLOS              3.01               3.38
Bicycle LOS                          C                  C

  Overall results are not computed when free-flow speed is less than 45 mph.
```

```
                    HCS 2010: Multilane Highways Release 6.50







Phone:                                     Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:         KDA
Agency/Co:
Date:            11/9/2020
Analysis Period: PM
Highway:         SR 41
From/To:         NORTH OF AVE 15
Jurisdiction:
Analysis Year:   2042 PMB
Project ID:

_______________________________FREE-FLOW SPEED_________________________________

                   Direction           1                  2
Lane width                           12.0      ft       12.0      ft
Lateral clearance:
     Right edge                      6.0       ft       6.0       ft
     Left edge                       6.0       ft       6.0       ft
     Total lateral clearance         12.0      ft       12.0      ft
Access points per mile               1                  1
Median type                          Divided            Divided
Free-flow speed:                     Base               Base
     FFS or BFFS                     60.0      mph      60.0      mph
Lane width adjustment, FLW           0.0       mph      0.0       mph
Lateral clearance adjustment, FLC    0.0       mph      0.0       mph
Median type adjustment, FM           0.0       mph      0.0       mph
Access points adjustment, FA         0.3       mph      0.3       mph
Free-flow speed                      59.8      mph      59.8      mph

____________________________________VOLUME_____________________________________

                   Direction           1                  2
Volume, V                            1390      vph      820       vph
Peak-hour factor, PHF                0.92               0.92
Peak 15-minute volume, v15           378                223
Trucks and buses                     5         %        5         %
Recreational vehicles                4         %        4         %
Terrain type                         Level              Level
    Grade                            0.00      %        0.00      %
    Segment length                   0.00      mi       0.00      mi
Number of lanes                      2                  2
Driver population adjustment, fP     1.00               1.00
Trucks and buses PCE, ET             1.5                1.5
Recreational vehicles PCE, ER        1.2                1.2
Heavy vehicle adjustment, fHV        0.968              0.968
Flow rate, vp                        780       pcphpl   460       pcphpl

____________________________________RESULTS____________________________________
```

```
                   Direction          1                  2
Flow rate, vp                        780       pcphpl   460       pcphpl
Free-flow speed, FFS                 59.8      mph      59.8      mph
Avg. passenger-car travel speed, S   60.0      mph      60.0      mph
Level of service, LOS                B                  A
Density, D                           13.0      pc/mi/ln 7.7       pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp               55                 55
Percent of segment with occupied
on-highway parking                   0                  0
Pavement rating, P                   3                  3
Flow rate in outside lane, vOL       755.4              445.7
Effective width of outside lane, We  24.00              24.00
Effective speed factor, St           4.79               4.79
Bicycle LOS Score, BLOS              3.53               3.27
Bicycle LOS                          D                  C

  Overall results are not computed when free-flow speed is less than 45 mph.
```

```
                    HCS 2010: Multilane Highways Release 6.50






Phone:                                     Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:         KDA
Agency/Co:
Date:            11/9/2020
Analysis Period: AM
Highway:         SR 41
From/To:         AVE 12 TO AVE 15
Jurisdiction:
Analysis Year:   2042 PMB
Project ID:

_______________________________FREE-FLOW SPEED_________________________________

                   Direction           1                  2
Lane width                           12.0      ft       12.0      ft
Lateral clearance:
     Right edge                      6.0       ft       6.0       ft
     Left edge                       6.0       ft       6.0       ft
     Total lateral clearance         12.0      ft       12.0      ft
Access points per mile               1                  1
Median type                          Divided            Divided
Free-flow speed:                     Base               Base
     FFS or BFFS                     60.0      mph      60.0      mph
Lane width adjustment, FLW           0.0       mph      0.0       mph
Lateral clearance adjustment, FLC    0.0       mph      0.0       mph
Median type adjustment, FM           0.0       mph      0.0       mph
Access points adjustment, FA         0.3       mph      0.3       mph
Free-flow speed                      59.8      mph      59.8      mph

____________________________________VOLUME_____________________________________

                   Direction           1                  2
Volume, V                            630       vph      1220      vph
Peak-hour factor, PHF                0.92               0.92
Peak 15-minute volume, v15           171                332
Trucks and buses                     5         %        5         %
Recreational vehicles                4         %        4         %
Terrain type                         Level              Rolling
    Grade                            0.00      %        0.00      %
    Segment length                   0.00      mi       0.00      mi
Number of lanes                      2                  2
Driver population adjustment, fP     1.00               1.00
Trucks and buses PCE, ET             1.5                2.5
Recreational vehicles PCE, ER        1.2                2.0
Heavy vehicle adjustment, fHV        0.968              0.897
Flow rate, vp                        353       pcphpl   739       pcphpl

____________________________________RESULTS____________________________________
```

```
                   Direction           1                  2
Flow rate, vp                        353       pcphpl   739       pcphpl
Free-flow speed, FFS                 59.8      mph      59.8      mph
Avg. passenger-car travel speed, S   60.0      mph      60.0      mph
Level of service, LOS                A                  B
Density, D                           5.9       pc/mi/ln 12.3      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp               55                 55
Percent of segment with occupied
on-highway parking                   0                  0
Pavement rating, P                   3                  3
Flow rate in outside lane, vOL       342.4              663.0
Effective width of outside lane, We  24.00              24.00
Effective speed factor, St           4.79               4.79
Bicycle LOS Score, BLOS              3.13               3.47
Bicycle LOS                          C                  C

  Overall results are not computed when free-flow speed is less than 45 mph.
```

```
                    HCS 2010: Multilane Highways Release 6.50





Phone:                                     Fax:
E-mail:

___________________________OPERATIONAL ANALYSIS________________________________

Analyst:         KDA
Agency/Co:
Date:            11/9/2020
Analysis Period: PM
Highway:         SR 41
From/To:         AVE 12 TO AVE 15
Jurisdiction:
Analysis Year:   2042 PMB
Project ID:

_______________________________FREE-FLOW SPEED_________________________________

                   Direction           1                  2
Lane width                           12.0      ft       12.0      ft
Lateral clearance:
     Right edge                      6.0       ft       6.0       ft
     Left edge                       6.0       ft       6.0       ft
     Total lateral clearance         12.0      ft       12.0      ft
Access points per mile               1                  1
Median type                          Divided            Divided
Free-flow speed:                     Base               Base
     FFS or BFFS                     60.0      mph      60.0      mph
Lane width adjustment, FLW           0.0       mph      0.0       mph
Lateral clearance adjustment, FLC    0.0       mph      0.0       mph
Median type adjustment, FM           0.0       mph      0.0       mph
Access points adjustment, FA         0.3       mph      0.3       mph
Free-flow speed                      59.8      mph      59.8      mph

____________________________________VOLUME_____________________________________

                   Direction           1                  2
Volume, V                            1575      vph      1070      vph
Peak-hour factor, PHF                0.92               0.92
Peak 15-minute volume, v15           428                291
Trucks and buses                     5         %        5         %
Recreational vehicles                4         %        4         %
Terrain type                         Level              Rolling
    Grade                            0.00      %        0.00      %
    Segment length                   0.00      mi       0.00      mi
Number of lanes                      2                  2
Driver population adjustment, fP     1.00               1.00
Trucks and buses PCE, ET             1.5                2.5
Recreational vehicles PCE, ER        1.2                2.0
Heavy vehicle adjustment, fHV        0.968              0.897
Flow rate, vp                        884       pcphpl   648       pcphpl

____________________________________RESULTS____________________________________
```

```
                   Direction           1                  2
Flow rate, vp                        884       pcphpl   648       pcphpl
Free-flow speed, FFS                 59.8      mph      59.8      mph
Avg. passenger-car travel speed, S   60.0      mph      60.0      mph
Level of service, LOS                B                  A
Density, D                           14.7      pc/mi/ln 10.8      pc/mi/ln

__________________________ Bicycle Level of Service __________________________

Posted speed limit, Sp               55                 55
Percent of segment with occupied
on-highway parking                   0                  0
Pavement rating, P                   3                  3
Flow rate in outside lane, vOL       856.0              581.5
Effective width of outside lane, We  24.00              24.00
Effective speed factor, St           4.79               4.79
Bicycle LOS Score, BLOS              3.60               3.40
Bicycle LOS                          D                  C

  Overall results are not computed when free-flow speed is less than 45 mph.
```

APPENDIX I

Madera County Board Resolution 2016-269
(Amendment to Board Resolution 2015-124)

BEFORE
THE BOARD OF SUPERVISORS
OF THE COUNTY OF MADERA
STATE OF CALIFORNIA

In the Matter of

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

Resolution No. 2016 - 269

A RESOLUTION OF THE MADERA
COUNTY BOARD OF SUPERVISORS
AMENDING RESOLUTION 2015-124
ADOPTING AN OFFICIAL PLAN LINE
AND SPECIFIC PLAN LINE

WHEREAS, on September 22, 2015 the Board of Supervisors of the County of Madera, State of California approved Resolution 2015 – 124 adopting an Official Plan Line for Rio Mesa Boulevard and a Specific Plan Line for Flag Barn Way, and

WHEREAS, the Board wishes to adopt an amended Official Plan Line for Rio Mesa Boulevard to make it consistent with the Official Plan Line as depicted on Exhibit "A" to Resolution 2015-124, and

WHEREAS, Resolution 2015-124 is amended to read in its entirety as follows:

WHEREAS, the Department of Public Works has prepared a proposed Official Plan Line for Rio Mesa Boulevard between Children's Boulevard and Avenue 14 as shown on Exhibit "A" attached to this resolution, and

WHEREAS, no capital improvements are proposed at this time, and

WHEREAS, the new Official Plan Line is proposed to establish the correct location of the right of way for future development by adjacent property owners, and

WHEREAS, the Department of Public Works has prepared a proposed Specific Plan Line for Flag Barn Way which loops around Rio Mesa Boulevard between Avenue

12 and Avenue 14 as shown on Exhibit “A” attached to this resolution, and

WHEREAS, no capital improvements are proposed at this time, and

WHEREAS, the new Specific Plan Line is proposed to establish the correct location of the proposed right of way for future development by adjacent property owners.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of the County of Madera, that:

1. The Board adopts the Official plan Line as shown on Exhibit “A”.
2. The Board adopts the Specific Plan Line as shown on Exhibit “A”.

* * * * * * * *

The foregoing Resolution was adopted this 13th day of Sept, 2016 by the following vote:

Supervisor Frazier voted: yes

Supervisor Rogers voted: yes

Supervisor Farinelli voted: yes

Supervisor Rodriguez voted: yes

Supervisor Wheeler voted: yes

Chairman, Board of Supervisors

ATTEST:

Rhonda Cargill

Clerk, Board of Supervisors

Approved as to Legal Form:
COUNTY COUNSEL

By ______________________________
Douglas W. Nelson

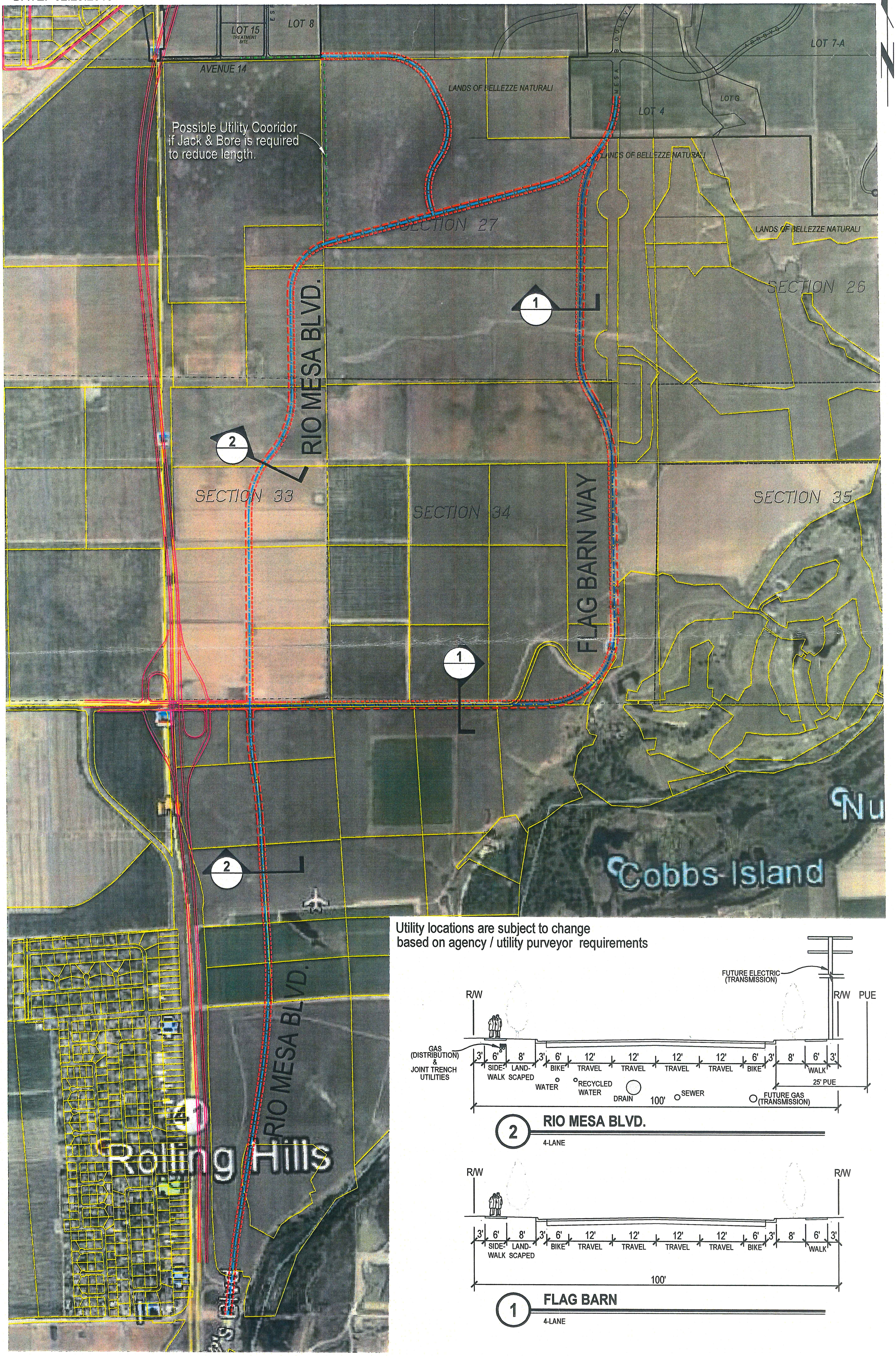
Z:\County Counsel\Public Works\Resolutions\adopting official pllan line and specific plan line.doc

EXHIBIT “A”

EXHIBIT FOR RIO MESA BLVD. & FLAG BARN WAY

DATE: 02.25.2015

GRAPHIC SCALE
1500 750 0 1500
1 in = 1500 ft



Utility locations are subject to change
based on agency / utility purveyor requirements

Dwg: X:\2012\12-0024-00\DWG\PLAN\EXHIBITS\RIO-MESA-2K.DWG | Saved: 02-26-15 06:45am GBARDINI | Plotted: