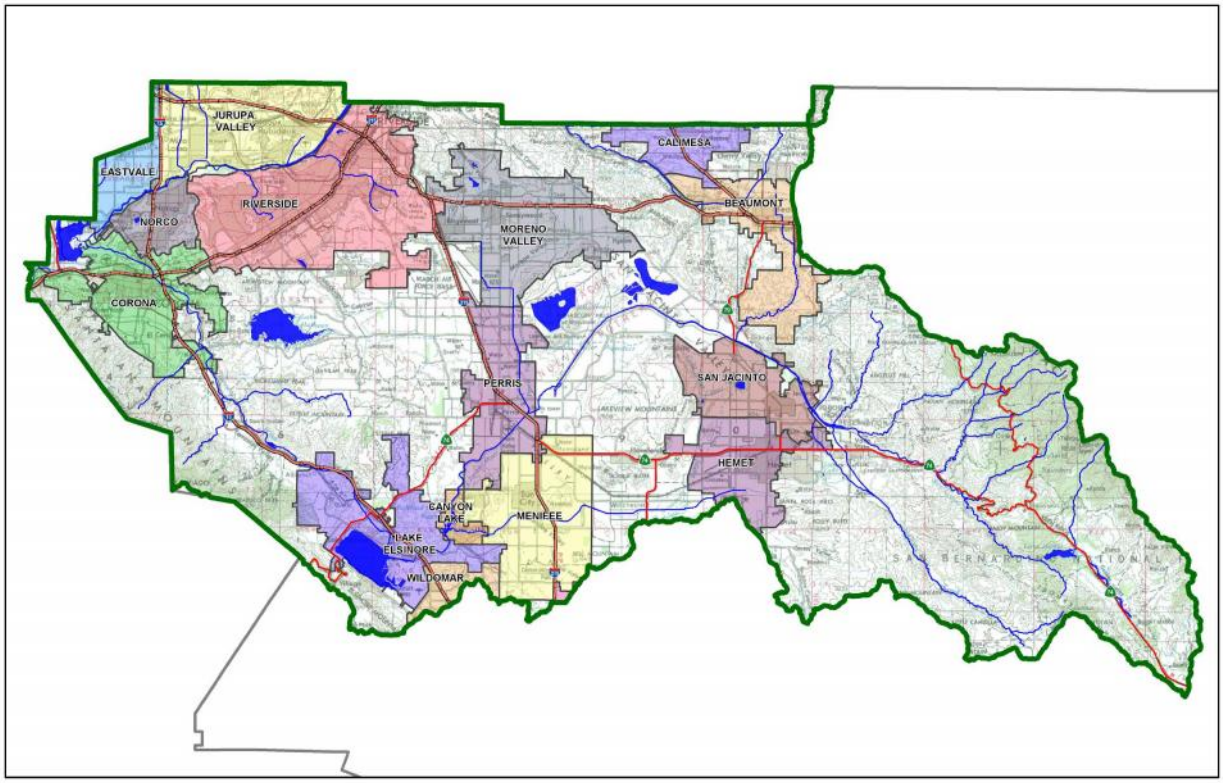
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Lakeside

Development No: Tentative Tract No. 38116

Design Review/Case No: Insert text here



☒ **Preliminary**
☐ **Final**

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Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**
Template revised June 30, 2016

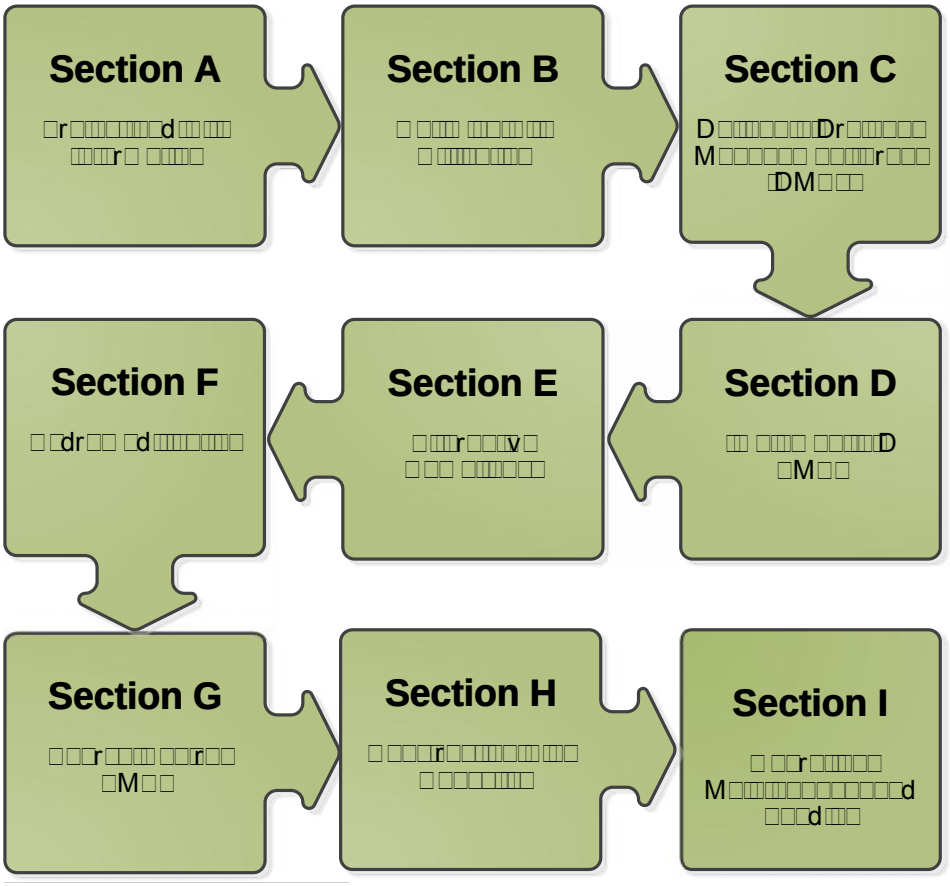
Contact Information:

Prepared for: Tri Pointe Homes
1250 Corona Pointe Court, Suite 600
Corona, CA 92879
(951) 428-4400

Prepared by: Ed Lenth, PE
Principal
MDS Consulting
17320 Redhill Ave., Suite 350
Irvine, CA 92614
Tel: (949) 251-8821

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Tri Pointe Homes by MDS Consulting for the Lakeside Tract No. 38116 project.

This WQMP is intended to comply with the requirements of City of Lake Elsinore for Ordinance No. 14.08 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Lake Elsinore Water Quality Ordinance Municipal Code Section 14.08.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Tri Pointe Homes c/o Michael Heishman	Director of Land Development
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	Aug. 4,, 2021 Date
Ed Lenth, PE Preparer's Printed Name	Principal Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Residential
Planning Area:	Lake Elsinore Area Plan
Community Name:	Lakeside
Development Name:	Tract No. 38116

PROJECT LOCATION
Latitude & Longitude (DMS): 33° 39' 48.39"N, 117° 22' 52.1"W
Project Watershed and Sub-Watershed: Lake Elsinore
Gross Acres: 34.81
APN(s): 379-060-022, portion of 379-060-005, 379-060-027
Map Book and Page No.: 2010 Thomas Guide, Page 865, Grid G6, G7, H6, H7

PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Residential (Condominium)
Proposed or Potential SIC Code(s)	1521
Area of Impervious Project Footprint (SF)	0 SF
Total Area of proposed Impervious Surfaces within the Project Footprint (SF)/or Replacement	506,891 SF
Does the project consist of offsite road improvements?	☐ Y ☒ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N

EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the Project limits Footprint (SF)	0 SF
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☒ Y ☐ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	"A", "B" and "D"Soil
What is the Water Quality Design Storm Depth for the project?	0.95"

This project proposes to construct 140 Condominium single family residences, with 2 Recreational Lot parks, 1 water quality basin and one open space lot on approximately 19.16 acres. As part of the tract boundary, a 15.65 acres of open space located south of Lake Elsinore will be preserved. The subject site is located immediately east of the intersection of Riverside Drive and Grand Avenue, in the City of Lake Elsinore, CA. The site vicinity and surrounding areas generally consist of vacant land, single-family residential and light commercial properties. The project site covers 34.81 ± ac of locally moderate ground cover and local tress.

The site is currently vacant and undeveloped with overall topography of 1267 to 1295 (MSL) elevation. Based from a previous geotechnical report prepared for the site by Southern California Geotechnical (SCG, 2006), groundwater was encountered from approximately 2 to 14 feet bgs. The report also shows that the site has significant potential liquefaction settlement.

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling
- BMP Locations (Lat/Long)

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, and the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Lake Elsinore (HU# 802.31)	PCBs, (Organic Compound), Nutrients, Organic Enrichment (Low DO), Sediment Toxicity, Unknown Toxicity	REC1, REC2, WARM, WILD,	Not a water body classified as RARE
Temescal Creek Reach 6	Pathogens	GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE
Temescal Creek Reach 5	None	AGR, GWR, REC1, REC2, WARM, WILD, RARE	23 miles
Temescal Creek Reach 4	None	AGR, GWR, REC1, REC2, WARM, WILD, RARE	26 miles
Lee Lake/Temescal Creek Reach 3	None	MUN, AGR, IND, PROC	Not a water body classified as RARE
Temescal Creek Reach 2	None	AGR, IND, GWR, REC1, REC2, LWRM, WILD	Not a water body classified as RARE
Temescal Creek Reach 1	Miscellaneous	REC1, REC2, WARM, WILD	Not a water body classified as RARE
Prado Basin Management Zone	None	REC1, REC2, WARM, WILD, RARE	49 Miles
Santa Ana River Reach 3	Copper, Lead, Pathogens	AGR, GWR, REC1, REC2, WARM, WILD, RARE	48 miles
Santa Ana River Reach 2	Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, RARE	52 miles
Santa Ana River Reach 1	None	REC1, REC2, WARM, WILD	Not a water body classified as RARE
Tidal Prism of Santa Ana (to within 1000' of Victoria Street) and Newport Slough	Enterococcus, Fecal Coliform, Total Coliform	IND, REC1, REC2, COMM, WILD, MAR, SHEL, EST	75 miles
Pacific Ocean Nearshore	None	IND, NAV, REC1, REC2,	76 miles

Zone		COMM, WILD, RARE, SPWN, MAR, SHEL	
Pacific Ocean Offshore Zone	None	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR, SHEL	76 miles

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* City of Lake Elsinore	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Project site design will continue these existing drainage patterns and direct runoff to the northeast through on-site water quality basin before entering Stage 1 of the South Riverside Channel (maintained by Riverside County Flood Control) and ultimately discharging to Lake Elsinore

Did you identify and protect existing vegetation? If so, how? If not, why?

Yes, the project proposes to protect and preserve an approximate of 15.65 ac of open space.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Project site is not feasible for infiltration due to "highest and best use" requirement for Lake Elsinore. All DMA runoff will be treated with Biotreatment / Bioretention with underdrains.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes. Width of roads and sidewalks are as narrow as possible per City of Lake Elsinore standards.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes. All runoff drains to bioretention basin via an on-site storm drain system. Project will not ba able to drain to adjacent pervious area within each residential lot since the project proposes high density residential units (condominium) which entails limited landscaped areas.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1][2]	Area (Sq. Ft.)	DMA Type
DMA A-1	Recreational Area/Landscape	18,988	Type "D"
DMA A-2	Recreational Area/Landscape	14,372	Type "D"
DMA A-3	Residential/Mixed Surface	721,160	Type "D"
DMA A-4	Basin/Natural "D" Soil	80,191	Type "D"
DMA A-5	Preserved Natural Open Space	681,712	Type "A"

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*
[2]*If multi-surface provide back-up*

Table C.2 Type 'A', Self-Treating Areas N/A

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
DMA A-5	681,712	Preserved Natural Open Space	N/A

Table C.3 Type 'B', Self-Retaining Areas N/A

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA	**Receiving Self-Retaining DMA**

DMA Name/ ID	Area (square feet)	Post-project surface type	Impervious fraction	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA A-1	Bioretention Basin "A"
DMA A-2	Bioretention Basin "A"
DMA A-3	Bioretention Basin "A"
DMA A-4	Bioretention Basin "A"

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☒ Y ☐ N

Lake Elsinore is evaporating faster than runoff from natural precipitation, requiring infiltration of 85% of runoff from project site will exacerbate current water quality problems associated with pollutant concentration due to lake water evaporation.

If yes has been checked, Infiltration BMPs shall not be used for the site; proceed to section D.3

If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

N/A no infiltration required onsite due to "highest and best use" for Lake Elsinore

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		
If Yes, list affected DMAs:		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		
Describe here:		

If you answered “Yes” to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If none of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: Insert Area (Acres)

Type of Landscaping (Conservation Design or Active Turf): List Landscaping Type

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: EIATIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: Insert Area (Acres)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
Insert Area (Acres)	Insert Area (Acres)

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: Number of daily Toilet Users

Project Type: Enter 'Residential', 'Commercial', 'Industrial' or 'Schools'

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-2 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: TUTIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: Required number of toilet users

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
Insert Area (Acres)	Insert Area (Acres)

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Insert narrative description here.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: Projected Average Daily Use (gpd)

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-4 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-4: Enter Value

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: Minimum use required (gpd)

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the projected average daily use (Step 1) to the minimum required non-potable use (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment per Section 3.4.2 of the WQMP Guidance Document.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA A1	☐	☐	☐	☒	☐
DMA A2	☐	☐	☐	☒	☐
DMA A3	☐	☐	☐	☒	☐
DMA A4	☐	☐	☐	☒	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Project site is not feasible for infiltration due to "highest and best use" requirement for Lake Elsinore. All DMA runoff will be treated with Biotreatment / Bioretention with underdrains.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Bioretention Basin "A"*		
	[A]		[B]	[C]	[A] x [C]			
DMA A-1	*18,988*	*Landscape*	*0.10*	*0.11*	*2097.4*	*Design Storm Depth (in)*	*Design Capture Volume,* V_{BMP} *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA A-2	*14,372*	*Landscape*	*0.10*	*0.11*	*1,587.5*			
DMA A-3	*721,160*	*Mixed Area*	*0.65*	*0.45*	*323,929.4*			
DMA A-4	*80,191*	*Natural "D" Soil*	*0.40*	*0.28*	*22,430.4*			
	834,711				350044.7	0.95	27,711.87	***31,393***

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- Or -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☒ D□□□□□□d R□□d□□□□□ D□v□□□□□ □□□	□	□	□	□	□	□	□	□
☐ □□□□□□d R□□d□□□□□ D□v□□□□□ □□□	□	□	□	□	□	□	□	□[2]
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☐ R□□□□□ □□□□□□□□ □□□□□	□	□	□	□	□	□	□	□
Project Priority Pollutant(s) of Concern	☒	☐	☒	☐	☒	☐	☐	☒

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
N/A	
Total Credit Percentage[1]	

[1]Cannot Exceed 50%

[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing N/A

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor		*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
N/A									
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document

[E] is for Flow-Based Treatment Control BMPs [E] = .2, for Volume-Based Control Treatment BMPs, [E] obtained from Exhibit A in the WQMP Guidance Document

[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12

[H] is from the Total Credit Percentage as Calculated from Table E.2 above

[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
N/A		

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Reference Table E.1 above to populate this column.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	INSERT VALUE	INSERT VALUE	INSERT VALUE
Volume (Cubic Feet)	INSERT VALUE	INSERT VALUE	INSERT VALUE

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Susceptibility Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

Lake Elsinore (see Appendix 7)

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Location of inlets/CB shown on WQMP Site Plan Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at ww.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm

		drains or to store or deposit materials so as to create a potential discharge to storm drains."
Landscape/ Outdoor Pesticide Use	Final landscaping plans will Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Consider using pest-resistant plants, especially adjacent to hardscape. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in"What you should know for…..Landscape and Gardening" Provide IPM information to new owners, lessees and operators
Plazas, sidewalks, and parking lots.		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.
Pools, spas, ponds, decorative fountains, And other water features.	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
Vehicle and Equipment Cleaning	If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Services Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http:// rcflood.or/stormwater/
Roofing, gutters, and trim.	Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	BMP Location (Lat/Long)
Basin "A"	Bioretention w/ underdrains	Tentative Tract No. 38116 sheet 1 and 5	33.664325, -117.380816

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Tri Pointe Homes will be responsible for maintenance and Funding until proper turn over to HOA and City of Lake Elsinore.

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Non-Structural Source BMP Operation and Maintenance

BMP Description	Responsible Party	Procedure and Inspection Requirements	Frequency/Schedule
Education for Property Owners, Operators, Tenants, Occupants, or Employees	Developer then HOA	Educational materials will be available to employees, maintenance crews and contractors. Materials will include environmental awareness such as proper use of chemicals, discharges of wastes, dry cleaning, catch basins and storm drain maintenance, watershed protection. Provide educational materials on an annual basis and upon hiring of employees or any new tenant	Annually
Activity Restrictions	Developer then HOA	Once project has been turned over, certain restrictions may be enacted thru the formation of conditions and CCRs to protect surface water runoff. Provide copy of WQMP to all employees and contractors that do the maintenance work	Annually
Irrigation System and Landscape Management	Developer then HOA and Property Owners	Inspect all Common landscape areas and replace dead vegetation Properly manage pesticides and fertilizers per City/County Ordinances Inspect, adjust, and repair irrigation system. AB 1881 Compliant	Monthly during regular maintenance. Weekly during regular maintenance. Weekly, during regular maintenance
Common Area Litter Control	Developer then Owner and/or Maintenance Contractors	The HOA will be responsible for funding the common areas and slopes within the development. The City of Lake Elsinore will be responsible funding for areas within public right-of-way or property transferred to City (i.e. detention basins, riparian area, parks). Inspect and remove all litter and debris located in all common areas, including streets, parkways and sidewalks. Empty trash dumpsters located within delivery area.	Weekly
Street Sweeping Public Streets	City of Lake Elsinore	Inspect and remove all litter and debris. Clean up oil spills.	Twice a month

Drainage Facility Inspection and Maintenance	Developer then HOA	Inspect all catch basin and stormdrain pipes, remove litter, debris and any liquids Drainage facilities shall be cleaned if accumulated sediment/debris fills 25% or more of the sediment/debris capacity.	Minimum 3 times annually During the rainy season, beginning October 1st, inspections and maintenance activities shall be required following each rain event.

Structural Source Control BMP Operation and Maintenance

BMP Description	Responsible Party	Procedure and Inspection Requirements	Frequency/Schedule
MS4 Stenciling and Signage	Developer then City of Lake Elsinore	Tri Pointe Homes (property owner) to provide stenciling or labeling of all storm drain inlets and catch basins for one year following completion of construction. At that time, the public storm drain inlets shall be maintained by the City of Lake Elsinore. Catch Basin Stenciling shall include prohibitive language such as: "NO DUMPING, ONLY RAIN IN THE DRAIN" and/or graphical icons to discourage illegal dumping. Inspection/maintenance of the storm drain stenciling may be performed by the City employees or contracted maintenance personnel. During inspection, the inspector(s) shall check for the maintenance indicators given below: • Faded, vandalized, or otherwise unreadable concrete stamping There are no routine maintenance activities for the concrete stamping. If inspection indicates the storm drain stenciling is intact, no action is required. If inspection indicates the concrete stamping is not legible, the storm drain stenciling shall be repaired or replaced, as necessary.	Every 6 months or as needed
Use efficient irrigation and landscape design	Developer then Owner and HOA	Inspect and repair landscape irrigation timers. Inspect and repair all sprinkler heads as needed. Remove and replace dead vegetation as needed.	Weekly

Protect Slopes and Channels	Developer then HOA	The HOA will be responsible for funding of the protection of slopes and channels within the development. HOA will be responsible for funding of areas within property transferred to HOA/ County Transportation (i.e. detention basins, riparian area, parks). Inspect Slopes for erosion for earthen or landscaped slopes. Inspect falling debris for stabilized slopes with reinforcing materials. Repair slopes whenever necessary.	Weekly and whenever necessary
Trash Storage Areas	Developer then Owner	A private contract shall be prepared between the HOA and CR&R, Incorporated (the current Trash Company). Listed below are minimal requirements from the Riverside County Water Quality Management Plan: • Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent offsite transport of trash. • Trash dumpsters shall be leak proof and have attached covers or lids. • Connection of trash area drains to MS4 is prohibited. • Trash compactors shall be roofed and set on a concrete pad. The pad shall be minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.	Weekly
Post Development Site Design BMP Operation and Maintenance			
BMP Description	**Responsible Party**	**Procedure and Inspection Requirements**	**Frequency/Schedule**

Bioretention Basins	Developer then HOA	The BMP sizing calculations and design details for the proposed Bioretention Basins are located in Section VIII, Appendix F. The Bioretention Basins shall be maintained on a quarterly basis and prior to the rainy season, October 1st of each year. The basin shall be inspected for the following maintenance indicators: Maintenance procedures for the basin include: • Remove debris and gross pollutants from the entire basin and structural facilities. • The basin side slopes should be mowed at least twice a year to discourage woody growth. After the first or second growing season, the side slopes should be evaluated to determine if reinforcement planting is needed. If needed, the additional planting shall be installed at the onset of the second growing season after construction. • Use of fertilizer, pesticides, and herbicides should be avoided. Appropriate native plant selection and other IPM methods shall be employed to use of such products. • Repair slopes that are eroded or slumping. • Sediment deposit in the basin will monitored after each storm event. Whenever substantial sediment accumulation has occurred, remove accumulated sediment from the bottom of the basin. Removal shall extend to the original basin depth. Accumulated sediment will be tested for heavy metals and organics to determine the appropriate disposal method.	See left.

Bioretention Basins

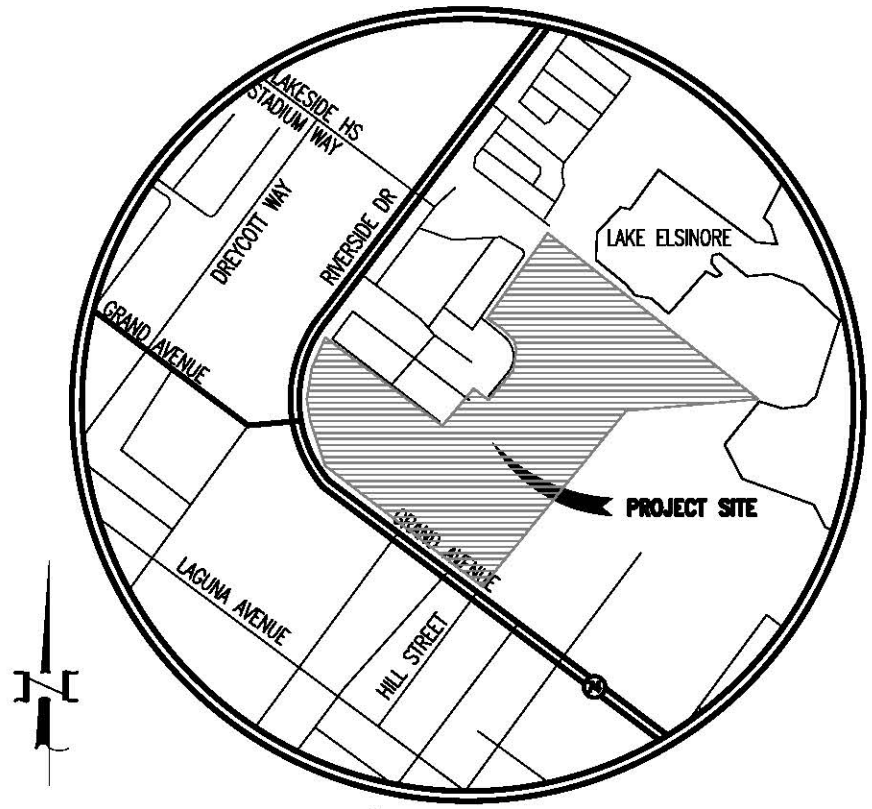
Tri Pointe Homes (property owner) is responsible for maintaining and funding of the Bioretention basins until they are placed or turned over to the HOA which is the entity responsible for the long-term abatement, trash removal, maintenance, general repairs, etc.

Operation and maintenance will be funded by an HOA. HOA dues will be established sufficient to cover the cost of maintenance into perpetuity. The long term operation and maintenance and funding of the basin shall be determined and the WQMP updated accordingly prior to 1st occupancy.

Developer: Tri Pointe Homes
Address: 1250 Corona Pointe Court, Suite 600
Corona, CA 92879
Contact Person: Michael Heishman
Telephone: (951) 428-4400

Appendix 1: M□□□□□d □□ □□□□ □□□

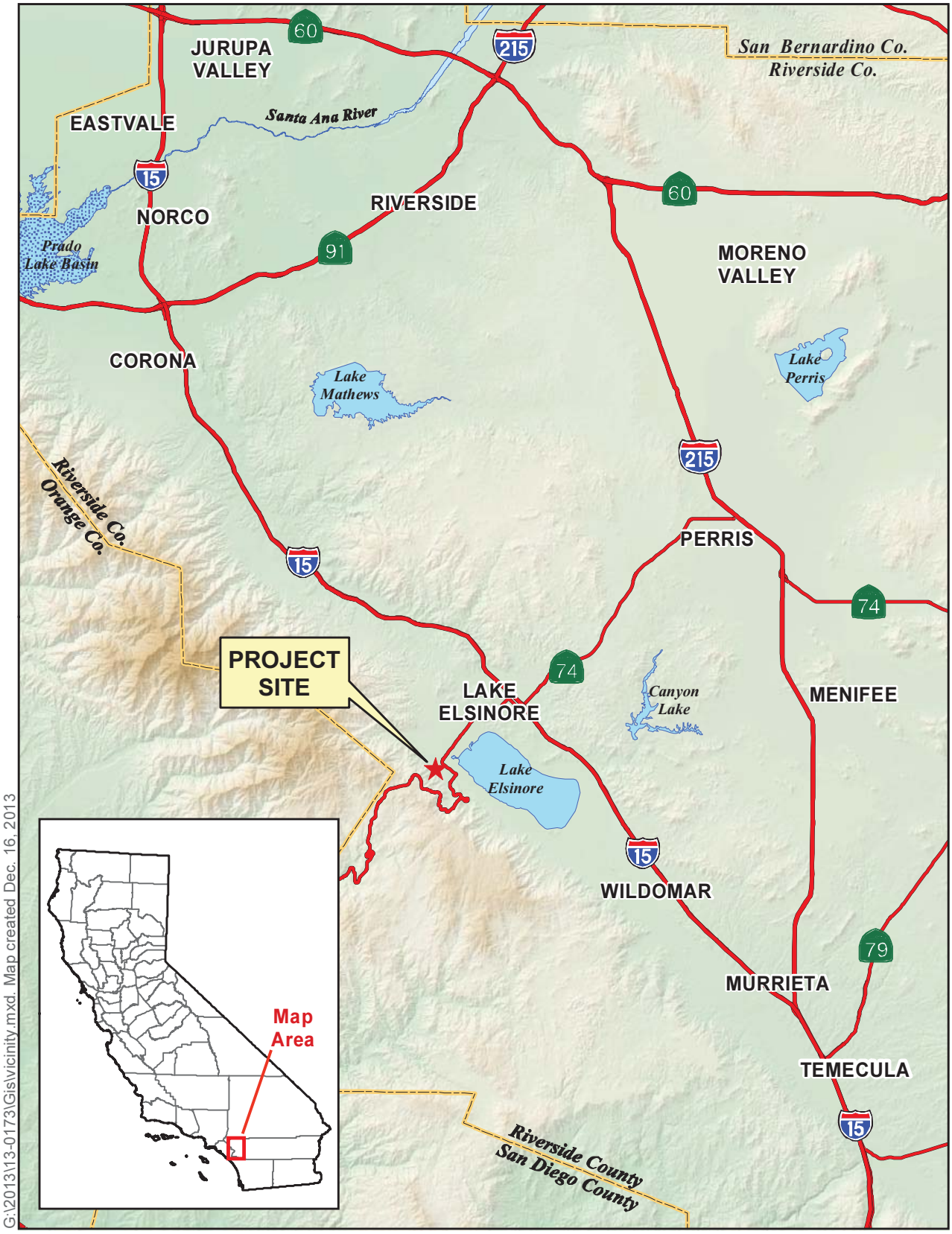
Location Map, WQMP Site Plan and Receiving Waters Map



VICINITY MAP
N.T.S.

TENTATIVE TRACT NO. 38116
LAKESIDE

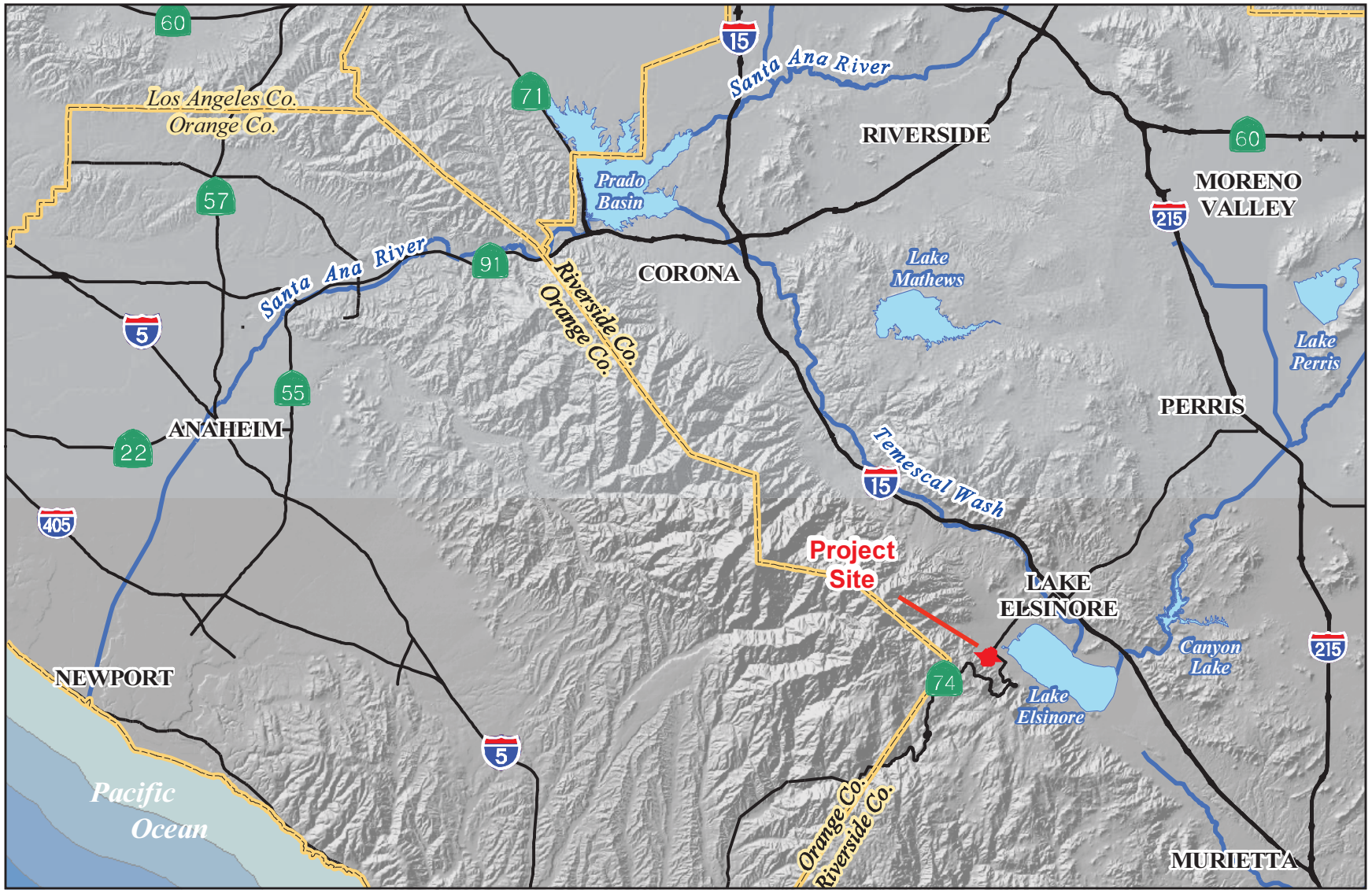
CITY OF LAKE ELSINORE



G:\2013\13-0173\Gis\vicinity.mxd. Map created Dec. 16, 2013

Figure 1 – Vicinity Map

Tract No. 38116 - Lakeside
City of Lake Elsinore



Sources: USGS 30 Meter DEM;
USGS Digital Line Graph

0 2 4 6
Miles

N
W WEBB E
S

Figure 2 Receiving Waterbodies

Tract No. 38116 - Lakeview
City of Lake Elsonore

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

0.85 MiraLoma
0.61 RiversideNorth
0.54 RiversideSouth
0.68 PigeonPass
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.90 HurkeyCreek
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Project Site

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | HEMET | CANYON LAKE | LAKE ELSINOR | MENIFEE | WILDOMAR | MURRIETA | TEMECULA

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

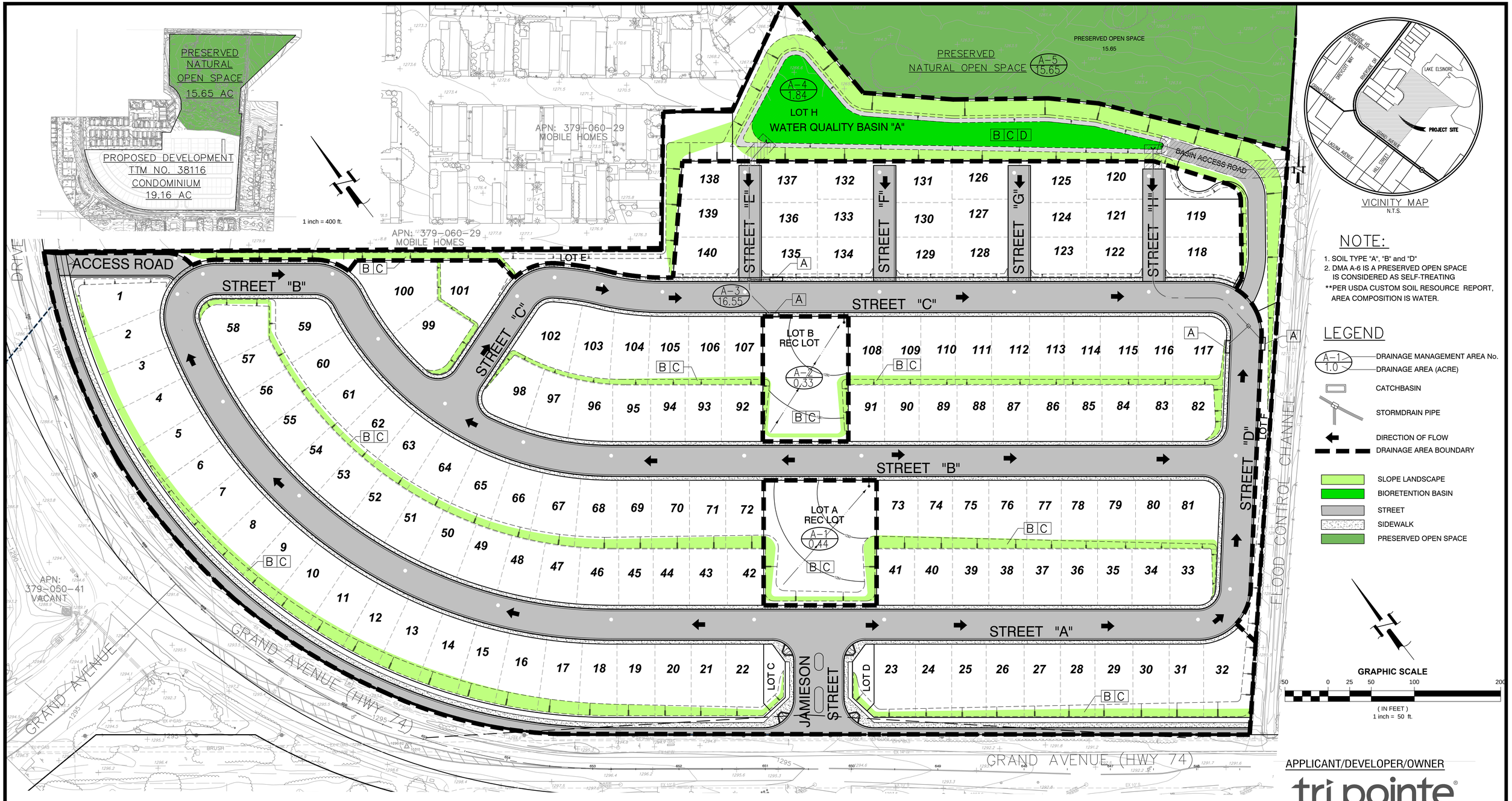
N

Rain Gage Locations

R□V□R□□D□□□□□□□□□□□□□□D
□□□□R□□□□D□□□ □□□R
□□□□RV□□□□□D□□□R□□□

Isohyetal Map for the 85th Percentile 24 hour Storm Event

□□□□2□□□



NOTE:

1. SOIL TYPE "A", "B" and "D"
2. DMA A-6 IS A PRESERVED OPEN SPACE IS CONSIDERED AS SELF-TREATING
   **PER USDA CUSTOM SOIL RESOURCE REPORT, AREA COMPOSITION IS WATER.

LEGEND

- A-1 / 1.0 — DRAINAGE MANAGEMENT AREA No. / DRAINAGE AREA (ACRE)
- CATCHBASIN
- STORMDRAIN PIPE
- DIRECTION OF FLOW
- DRAINAGE AREA BOUNDARY
- SLOPE LANDSCAPE
- BIORETENTION BASIN
- STREET
- SIDEWALK
- PRESERVED OPEN SPACE

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

APPLICANT/DEVELOPER/OWNER

tri pointe HOMES
1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

BMP SUMMARY

BIORETENTION FACILITY			
BASIN 'A'	Vbmp	BASIN CAPACITY	BMP LOCATION (LAT/LONG)
	27,954.43 CU-FT	31,393 CU-FT	33.66435, -117.380816

DMA SUMMARY

DMA ID	AREA (SF)	AREA (AC)	LAND USE	IMPERVIOUS
DMA A-1	18,988	0.44	RECREATIONAL AREA / LANDSCAPE	0.10
DMA A-2	14,372	0.33	RECREATIONAL AREA / LANDSCAPE	0.10
DMA A-3	721,160	16.55	RESIDENTIAL / MIXED AREA	0.65
DMA A-4	80,191	1.84	BASIN / NATURAL "D" SOIL	0.40
DMA A-5	681,712	15.65	PRESERVED NATURAL OPEN SPACE	**WATER

STRUCTURAL CONTROL BMP LEGEND:

STRUCTURAL SOURCE CONTROL BMPS

- A — MS4 STENCILING AND SIGNAGE (CASQA BMP SD-13)
- B — LANDSCAPE AND IRRIGATION SYSTEM DESIGN (CASQA BMP SD-12, TYPICAL FOR ALL LANDSCAPED AREAS)
- C — PROTECT SLOPES AND CHANNELS (TYPICAL FOR ALL SLOPE AREAS)

STRUCTURAL TREATMENT CONTROL BMPS

- D — BIORETENTION

REGISTERED PROFESSIONAL ENGINEER
EDWARD J. LEATH
No. 052496
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA

Date	By	REVISIONS	App'd

MDS CONSULTING
MORSE SCHULTZ
17320 Redhill Ave.
Suite 350
Irvine, CA 92614
Voice: 949-251-8821
FAX: 949-251-0516
PLANNERS ENGINEERS SURVEYORS

PLATE 1

TENTATIVE TRACT NO. 38116
LAKESIDE
PRELIMINARY WQMP SITE MAP

Last Revised: Thu Aug 05, 2021 - 8:40pm Last Plotted: Thu Aug 05, 2021 - 8:42pm Plotted By: station182 Drawing: I:\89490\DRAINAGE\WQMP\PRELIMINARY\Drawing\PWQMP Tr 38116 89490.dwg

Appendix 2: Construction Plans

Grading and Drainage Plans

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF LAKE ELSINORE IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1 (APN 379-060-022):
BLOCK D OF A MAP OF A PORTION OF THE LA LAGUNA RANCH, IN THE CITY OF LAKE ELSINORE, AS SHOWN BY MAP ON FILE IN BOOK 1, PAGE 36 OF MAPS, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE STATE OF CALIFORNIA BY DEED RECORDED OCTOBER 26, 1961 AS INSTRUMENT NO. 92163 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

ALSO EXCEPTING THEREFROM THAT PORTION LYING NORTHWEST OF THE FOLLOWING DESCRIBED LINE:

BEGINNING AT THE MOST WESTERLY CORNER OF THE LAND SHOWN AS PARCEL 3090-2C ON FILE IN BOOK 54, PAGE 49 OF RECORDS OF SURVEY, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA;

THENCE NORTH 37°02'20" EAST 383.77 FEET ON THE NORTHWEST LINE OF SAID PARCEL 3090-2C AND THE NORTHEASTERLY PROLONGATION THEREOF TO A ¾" IRON PIPE SHOWN AS FOUND ON LAST SAID MAP;
THENCE SOUTH 52°57'40" EAST, 773.00 FEET TO THE TRUE POINT OF BEGINNING;
THENCE SOUTH 37°02'20" WEST, 511.06 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE WESTERLY, HAVING A RADIUS OF 193.00 FEET, A RADIAL TO SAID BEGINNING BEARS NORTH 61°31'38" EAST;
THENCE SOUTHERLY 220.67 FEET ON SAID CURVE THROUGH A CENTRAL ANGLE OF 65°30'42";
THENCE SOUTH 37°02'20" WEST 50.00 FEET; THENCE SOUTH 61°20'49" WEST, 232.48 FEET;
THENCE NORTH 52°57'40" WEST, 80.30 FEET TO A POINT WHICH BEARS SOUTH 57°57'40" EAST 760.00 FEET FROM THE CENTERLINE OF RIVERSIDE DRIVE, 60.00 FEET WIDE, AS SHOWN ON FIRST SAID MAP;
THENCE SOUTH 37°02'20" WEST 127.00 FEET;
THENCE SOUTH 52°57'40" EAST, 122.00 FEET;
THENCE SOUTH 37°02'20" WEST, 291.00 FEET; THENCE NORTH 52°57'40" WEST, 743.98 FEET TO THE EASTERLY LINE OF SAID LAND CONVEYED TO THE STATE OF CALIFORNIA AND THE END OF THE LINE TO BE DESCRIBED.

ALSO EXCEPTING THEREFROM THAT PORTION LYING NORTHEAST OF THE SOUTHWEST LINE OF THE LAND SHOWN AS PARCEL 3090-2A ON SAID MAP ON FILE IN BOOK 54, PAGE 49 OF RECORDS OF SURVEY, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 2 (A PORTION OF APN 379-060-005):
THE NORTHWEST 4.00 ACRES OF LOT 1, BLOCK C OF A MAP SHOWING SUBDIVISIONS IN ELSINORE, IN THE CITY OF ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 8 PAGE 377 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA.

SAID LAND IS SHOWN A PARCEL A IN LOT 1, BLOCK C OF RANCHO LA LAGUNA, ON FILE IN BOOK 12, PAGE 4 OF RECORDS OF SURVEY, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 3 (A PORTION OF APN 379-060-005):
THAT PORTION OF LOT 1 IN BLOCK C OF A MAP SHOWING SUBDIVISIONS IN ELSINORE, IN THE CITY OF ELSINORE, AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 377 OF MAPS, RECORDS OF SAN DIEGO COUNTY, CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST SOUTHERLY CORNER OF THE NORTHWEST 4.00 ACRES OF SAID LOT 1;
THENCE SOUTHEAST 60.00 FEET ON THE SOUTHWEST LINE OF SAID LOT 1;
THENCE NORTHEAST PARALLEL WITH THE SOUTHEAST LINE OF SAID NORTHWEST 4.00 ACRES TO THE NORTHERLY LINE OF SAID LOT 1;
THENCE WESTERLY ON SAID NORTHERLY LINE TO THE MOST EASTERLY CORNER OF SAID NORTHWEST 4.00 ACRES;
THENCE SOUTHWEST ON THE SOUTHEAST LINE OF SAID NORTHWEST 4.00 ACRES TO THE POINT OF BEGINNING.

EXCEPT THAT PORTION CONVEYED TO THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT BY DEED RECORDED AUGUST 07, 1970 AS INSTRUMENT NO. 77806 OF OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

PARCEL 4 (APN 379-060-027):
PARCEL 2 OF THAT CERTAIN LOT LINE ADJUSTMENT NO 89-13 RECORDED JANUARY 30, 1990 AS INSTRUMENT NO. 90-037878, OFFICIAL RECORDS OF RIVERSIDE, CALIFORNIA, DESCRIBED AS FOLLOWS:

THAT PORTION OF BLOCK D OF RANCHO LA LAGUNA AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 377 OF MAPS, SAN DIEGO COUNTY RECORDS, ALL IN THE COUNTY OF RIVERSIDE, DESCRIBED AS FOLLOWS:

COMMENCING AT THE INTERSECTION OF THE SOUTHWEST LINE OF AND SHOWN AS PARCEL 3090-2C ON SHEET 3 OF THE MAP FILED IN BOOK 54, PAGE 49 OF RECORDS OF SURVEY, IN THE OFFICE OF SAID COUNTY RECORDER WITH THE SOUTHEAST RIGHT OF WAY RIVERSIDE DRIVE; THENCE SOUTHERLY ALONG THE RIGHT OF WAY THE FOLLOWING 6 COURSES;
SOUTH 37°02'20" WEST, 350.93 FEET;
THENCE NORTH 52°57'40" WEST 20.00 FEET;
THENCE SOUTH 37°02'20" WEST, 276.35 FEET;
THENCE SOUTH 30°02'05" WEST, 81.70 FEET TO THE BEGINNING OF A CURVE CONCAVE SOUTHEASTERLY HAVING A RADIUS OF 665.00 FEET;
THENCE SOUTHWESTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 02°03'19", A DISTANCE OF 23.86 FEET TO THE POINT OF BEGINNING, TO WHICH RADIAL LINE OF SAID CURVE BEARS NORTH 62°01'14" WEST;
THENCE CONTINUING SOUTHWESTERLY ALONG SAID CURVE CONCAVE SOUTHEASTERLY THROUGH A CENTRAL ANGLE OF 23°15'31" A DISTANCE OF 269.95 FEET;
THENCE SOUTH 52°57'40" EAST, 743.98 FEET;
THENCE NORTH 37°02'20" EAST, 291.00 FEET;
THENCE NORTH 52°57'40" WEST, 122.00 FEET;
THENCE SOUTH 37°02'20" WEST 34.20 FEET;
THENCE NORTH 53°26'24" WEST 716.72 FEET TO THE POINT OF BEGINNING.

PURSUANT TO LOT LINE ADJUSTMENT 89-13, RECORDED JANUARY 30, 1990 AS INSTRUMENT NO. 90-37878 OF OFFICIAL RECORDS.

UTILITIES

WATER
EVMWD
31315 CHANEY ST.
LAKE ELSINORE, CA 95530
(951) 674-3146

SEWER
EVMWD
31315 CHANEY ST.
LAKE ELSINORE, CA 95530
(951) 674-3146

ELECTRIC
SOUTHERN CALIFORNIA EDISON
P.O. BOX 6400
RANCHO CUCAMONGA, CA 91729
(800) 655-4555

GAS
SOUTHERN CALIFORNIA GAS COMPANY
7000 INDIANA AVENUE, SUITE 105
RIVERSIDE, CA. 92506
(800) 427-2200

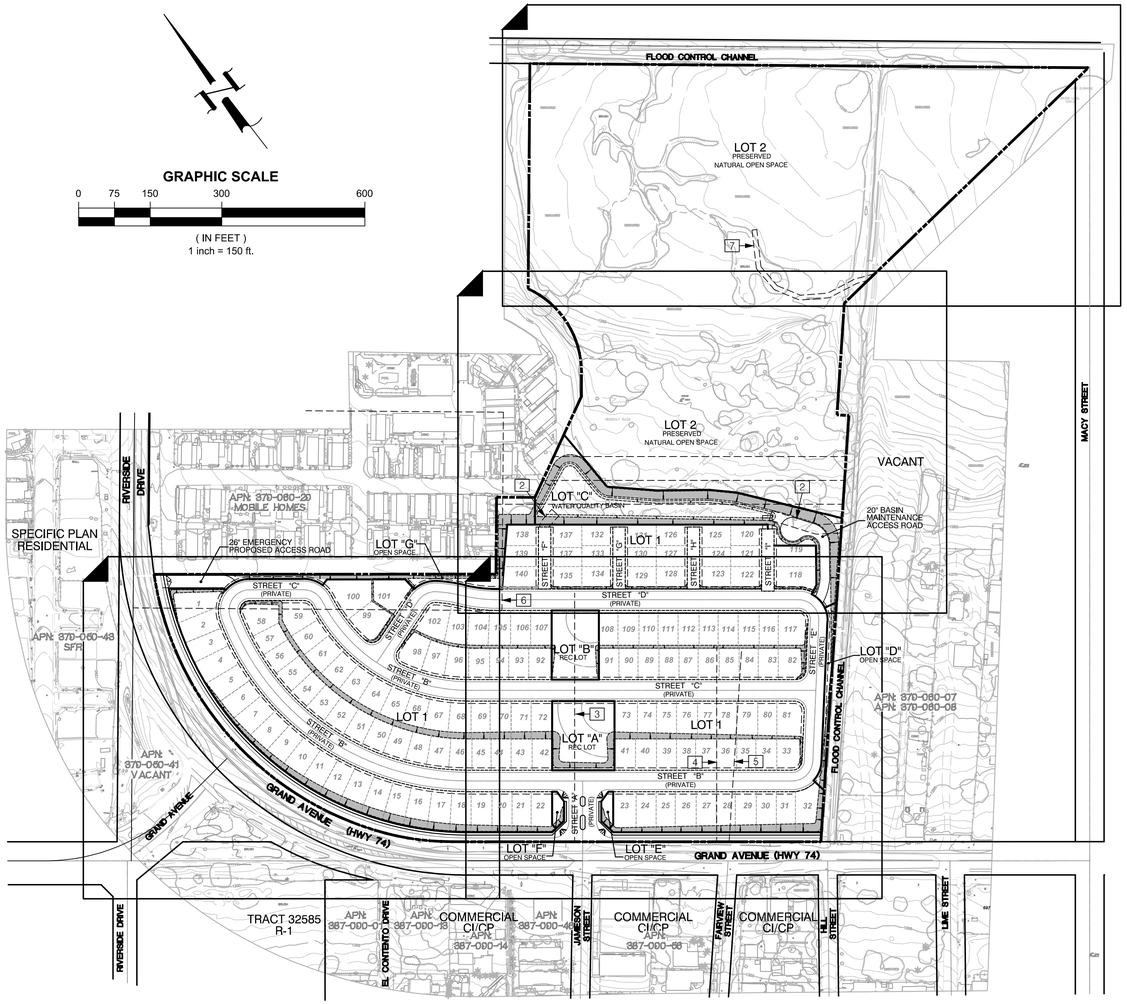
RECYCLE WATER
EVMWD
31315 CHANEY ST.
LAKE ELSINORE, CA 95530
(951) 674-3146

TRASH
C.R.& R
P.O. BOX 1208
PARRIS, CA 92572-1208
(951) 943-1991

TELEPHONE
SPECTRUM
31500 GRAPE STREET, SUITE 9
LAKE ELSINORE, CA 92532
(888) 406-7063

CABLE / INTERNET
COX COMMUNICATION
C/O. TEL-PATH COMMUNIATIONS
34350 BLOSSOMS DRIVE
LAKE ELSINORE, CA. 92532
(619) 992-2994

GRAPHIC SCALE
0 75 150 300 600
(IN FEET)
1 inch = 150 ft.



SHEET INDEX MAP

SCALE: 1"=150'

SITE COVERAGE SUMMARY

LOT	LAND USE	AREA (AC)	PERCENT (%)
1	CONDOMINIUM UNITS	10.94	31.4%
2	PRESERVED OPEN SPACE	15.65	45.0%
"A" - "B":	RECREATION LOTS	0.77	2.2%
"C"	BIO-DETENTION BASIN	1.39	4.0%
"D" - "G":	OPEN SPACE	0.65	1.9%
	PRIVATE STREET EAEMENTS:	4.60	13.2%
	GRAND AVENUE (RW TO TB)	0.81	2.3%
TOTAL: (GROSS ACREAGE)		34.81	100%

TENTATIVE TRACT NO. 38116

NUMBER OF LOTS: TOTAL	9
DETACHED SINGLE FAMILY RESIDENTIAL	1
RESERVED OPEN SPACE LOT	1
BIO-DETENTION BASIN	1
RECREATION LOTS	2
LANDSCAPE OPEN SPACE	4

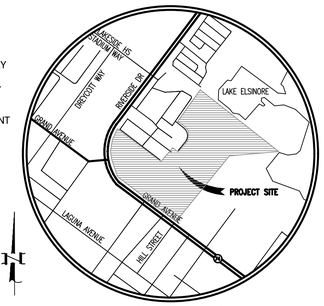
GROSS ACREAGE : 34.81 AC
CONTOUR INTERVAL : 1 FOOT
DATE : MATCH 25, 2021
REVISED : AUGUST 6, 2021

OPEN SPACE SUMMARY

LOTS	ACREAGE
'D'	0.12 AC
'E'	0.04 AC
'F'	0.04 AC
'G'	0.45 AC
TOTAL ACREAGE	0.65 AC

LEGEND

- 5 — CONDOMINIUM UNIT NUMBER
- 1280.0 — PAD ELEVATION
- CONDOMINIUM UNIT LINE
- PROPOSED STREET LIGHT
- PROPOSED FIRE HYDRANT
- SD — PROPOSED STORM DRAIN
- SS — PROPOSED NON-POTABLE WATER
- SW — PROPOSED SANITARY SEWER
- RCW — PROPOSED POTABLE WATER
- EX. SD — EXISTING STORM DRAIN
- EX. SS — EXISTING SANITARY SEWER
- EX. DW — EXISTING POTABLE WATER
- G — EXISTING GAS LINE
- 1.00% — PROPOSED STREET GRADE
- TENTATIVE TRACT BOUNDARY
- PROPOSED RETAINING WALL (SEE PLAN FOR HEIGHT)
- PROPOSED UTILITY EASEMENT
- 2:1 — PROPOSED 2:1 SLOPE
- 4:1 — PROPOSED 4:1 SLOPE
- 1450 — PROPOSED CENTERLINE STREET GRADE



VICINITY MAP
N.T.S.
2006 THOMAS BROTHERS
MAP BOOK, PAGES 865, GRID H6

SHEET INDEX

EASEMENTS NOTES

1. PROPOSED ESM'T FOR INGRESS/EGRESS AND PUBLIC UTILITY PURPOSES
2. PROPOSED 20' SD ESM'T
3. UTILITY ESM'T IN FAVOR OF SOUTHERN CALIFORNIA EDISON TO BE QUITCLAIMED
4. UTILITY ESM'T IN FAVOR OF CALIFORNIA ELECTRIC POWER COMPANY & CALIFORNIA WATER AND TELEPHONE COMPANY TO BE QUITCLAIMED
5. UTILITY ESM'T IN FAVOR OF SOUTHERN SIERRAS POWER COMPANY TO BE QUITCLAIMED
6. UTILITY ESM'T IN FAVOR OF GENERAL TELEPHONE COMPANY OF CALIFORNIA TO BE QUITCLAIMED
7. UTILITY ESM'T IN FAVOR OF GENERAL TELEPHONE COMPANY OF CALIFORNIA

GENERAL INFORMATION

1. EXISTING LAND USE: VACANT
2. EXISTING ZONING: R3 - HIGH DENSITY RESIDENTIAL
3. EXISTING GENERAL PLAN: R3 - HIGH DENSITY RESIDENTIAL
4. PROPOSED LAND USE: R3 - HIGH DENSITY RESIDENTIAL
5. PROPOSED ZONING: R3 - HIGH DENSITY RESIDENTIAL
6. PROPOSED GENERAL PLAN: HIGH DENSITY RESIDENTIAL
7. ADJACENT LAND USES:
   NORTH: PRESERVED NATURAL OPEN SPACE, TRAILER PARK
   EAST: FLOOD CONTROL CHANNEL, VACANT
   SOUTH: GRAND AVENUE (HWY 74), COMMERCIAL
   WEST: RIVERSIDE DRIVE, EXISTING S.F.R.
8. PARK REQUIREMENTS TO BE MET IN ACCORDANCE WITH THE R-3 ZONING COMMON OPEN SPACE REQUIREMENTS UNDER SECTION 17.84.120, ITEM B.
9. SCHOOL DISTRICTS: (LAKE ELSINORE SCHOOL DISTRICT)
   ELEMENTARY: ELEMENTARY SCHOOL
   MIDDLE SCHOOL: MIDDLE SCHOOL
   HIGH SCHOOL: HIGH SCHOOL
10. PAD ELEVATIONS SHOWN HEREON MAY BE ADJUSTED PLUS OR MINUS 3 FEET.
11. MULTIPLE FINAL MAPS MAY BE FILED PURSUANT TO SECTION 66456.1 OF THE CALIFORNIA GOVERNMENT CODE.
12. ALL PROPOSED MANUFACTURED SLOPES SHALL BE A MAXIMUM OF 2:1, UNLESS OTHERWISE NOTED ON THE TENTATIVE TRACT MAP.
13. ESTIMATED EARTHWORK QUANTITIES:

ADJUSTED CUT*	ADJUSTED FILL*	IMPORT
25,800 CY	82,000 CY	56,200 CY*

* ADJUSTMENTS INCLUDE SOIL SHRINKAGE (13%) AND PAD 0X (3.0') PER SOILS REPORT.

14. GEOTECHNICAL/SOILS INVESTIGATION REPORT WAS PREPARED BY LEIGHTON AND ASSOCIATES, DATED OCTOBER 30, 2020.
15. THERE ARE NO HABITABLE STRUCTURES WITHIN THE BOUNDARIES OF THIS TENTATIVE TRACT MAP.
16. PROPOSED PRIVATE STREET EASEMENTS 'A'-'I' WITHIN THIS TENTATIVE TRACT ARE PRIVATE AND SHALL BE MAINTAINED BY AN APPROVED H.O.A.
17. THE DEVELOPER/APPLICANT SHALL RESERVE THE RIGHT TO MERGE LOTS ON THE FINAL MAP.
18. THIS TENTATIVE TRACT MAP INCLUDES THE ENTIRE CONTIGUOUS OWNERSHIP OF LAND BEING SUBDIVIDED.
19. TOPOGRAPHIC SURVEY WAS FLOWN AND COMPILED BY DON READ CORP, DATED SEPTEMBER 17, 2020.
20. THERE ARE NO PROPOSED OPEN STORM DRAIN CHANNELS WITHIN THIS TENTATIVE TRACT MAP.
21. THIS TENTATIVE TRACT MAP IS PROPOSED TO BE A GATED COMMUNITY.
22. ACCESS SHALL BE RESTRICTED ON GRAND AVENUE (HWY 74) AND RIVERSIDE DRIVE.
23. FINAL DESIGN SHALL COMPLY WITH THE N.P.D.E.S. REQUIREMENTS OUTLINED BY THE CITY OF LAKE ELSINORE.
24. ALL PROPOSED RESIDENTIAL PAD SHALL MAINTAIN MINIMUM GRADE FROM REAR OF THE PAD TO THE STREET IN ACCORDANCE WITH LATEST CALIFORNIA BUILDING CODE.
25. FIRE PROTECTION SHALL BE PROVIDED BY RIVERSIDE COUNTY FIRE DEPARTMENT AND CAL FIRE.
26. ALL PROPOSED ON-SITE STORM DRAIN FACILITIES , SIZE AND LOCATION ARE PRELIMINARY AND SUBJECT TO FINAL HYDRAULIC CALCULATIONS ACCEPTABLE TO THE CITY OF LAKE ELSINORE.
27. ALL PROPOSED ON-SITE STORM WATER DISCHARGE FROM THIS TENTATIVE TRACT MAP SHALL BE TREATED BY PERMANENT ON-SITE TREATMENT CONTROL BMP'S FOR TRASH AND DEBRIS OF OFF-SITE AND ON-SITE PRIOR TO DISCHARGE TO ANY EXISTING OR PROPOSED DRAINAGE FACILITY.
28. ALL DIMENSIONS ON THIS TENTATIVE TRACT MAP ARE APPROXIMATE.
29. OPEN SPACE LOTS 'D'-'G', ARE PRIVATE AND MAINTAINED BY AN APPROVED H.O.A.
30. PROPOSED BIO-DETENTION WATER QUALITY BASIN IS PRIVATE AND MAINTAINED BY AN APPROVED H.O.A.
31. PROPOSED PRIVATE STREETS 'A' - 1' ARE FOR ACCESS AND PUBLIC UTILITY EASEMENT PURPOSES.
32. FLOOD ZONE 'X' AREA OF MINIMAL FLOODING PER FEMA PANEL 0600636 ZONE "F".
33. GATES MUST BE A MINIMUM 20' IN WIDTH, AUTOMATIC WITH RAPID ENTRY SYSTEM (S). GATES MUST BE SETBACK 35' FROM FACE OF CURB/ROAD RIGHT-OF-WAY, PER THE RIVERSIDE COUNTY FIRE DEPARTMENT
34. NO SUBSURFACE SEPTIC SEWAGE DISPOSAL IS PROVIDED.
35. PROJECT IS NOT WITHIN A COMMUNITY SERVICES DISTRICT.
36. THERE IS AN EXISTING CATOPED WELL ON THIS PROPERTY.
37. LAND IS SUBJECT TO A VERY HIGH LIQUEFACTION OR OTHER GEOLOGICAL HAZARD AND IS NOT WITHIN A SPECIAL STUDIES ZONE.
38. LAND IS SUBJECT TO OVERLFOW, INUNDATION OR FLOOD HAZARD.
39. EXISTING UTILITY POLES WITHIN THE GRAND AVENUE WIDENING IMPROVEMENTS TO BE REMOVED NO UNDERGROUNDED.
40. THE EXISTING TRAFFIC SIGNALS WITHIN THE GRAND WIDENING IMPROVEMENTS TO BE UNDERGROUNDED.
41. THE PRESERVED OPEN SPACE LOT 2 SHALL BE OWNED AND MAINTAINED BY AN APPROVED H.O.A.

FLOOD ZONE NOTE

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD.
THE 1% ANNUAL FLOOD (100-YEAR FLOOD), ALSO KNOWN AS THE BASE FLOOD, IS THE FLOOD THAT HAS A 1% CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR. THE SPECIAL FLOOD HAZARD AREA IS THE AREA SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD. AREAS OF SPECIAL FLOOD HAZARD INCLUDE ZONES A, AE, AH, AO, AR, A99, V AND VE. THE BASE FLOOD ELEVATION IS THE WATER-SURFACE ELEVATION OF THE 1% ANNUAL CHANCE FLOOD.

BEING A PORTION OF ZONE AE - BASE FLOOD ELEVATIONS DETERMINED= 1266.

BEING A PORTION OF ZONE X (OTHER FLOOD AREAS) - AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. MAP No. 06065C2017G DATED: AUGUST 28, 2008

BEING A PORTION OF ZONE X- AREAS DETERMINED TO BE OUTSIDE OF 0.2% ANNUAL CHANCE FLOODPLAIN. MAP NO. 06071C8745H DATED: AUGUST 28, 2008

ASSESSORS PARCEL NUMBER

PARCEL 1 (APN 379-060-022)
PARCEL 2 (A PORTION OF APN 379-060-005)
PARCEL 3 (A PORTION OF APN 379-060-005)
PARCEL 4 (APN 379-060-027)

BENCHMARK:

ELEVATION: 1281.62 (NGVD 29)
DATE: DEC. 1994 LEVEL SUMMARY FILED MAP FILES 261838 TO REACH INFORMATION
DESCRIPTION: BM-13-B-93 - SET CALDOT BRASS DISK IN W'LY CURB RIVERSIDE DR. (RTE 74) OPP FH 29' N'LY OF A 40' DRIVEWAY (31461) RIVERSIDE DR. AND 365' N'LY OF JOY ST. ±

BASIS OF BEARINGS:

THE BEARINGS SHOWN HEREON ARE BASED ON THE CENTERLINE OF GRAND AVENUE SHOWN AS N 52°57'57" W PER TRACT NO 33267 M.B. 471/11-13.

APPLICANT/DEVELOPER

TRI POINTE HOMES
1250 CORONA POINTE COURT, SUITE 600
CORONA, CA 92879
(951) 428-4400
CONTACT: CHRIS WILLIS

OWNER

TRI POINTE HOMES
1250 CORONA POINTE COURT, SUITE 600
CORONA, CA 92879
(951) 428-4400
CONTACT: CHRIS WILLIS

ENGINEER

MDS CONSULTING
17320 REDHILL AVENUE, SUITE 350
IRVINE, CA 92614
(949) 251-8821
CONTACT: ED LENTH

DATE:	NO.	REVISIONS

PREPARED FOR:
tri pointe HOMES
1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:
MDS CONSULTING
MORSE SCHULTZ
17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821
PLANNERS ENGINEERS SURVEYORS

MDS CONSULTING
17320 REDHILL AVENUE, SUITE 350
IRVINE, CA 92614
PHONE: (949) 251-8821
CONTACT: EDWARD J. LENTH

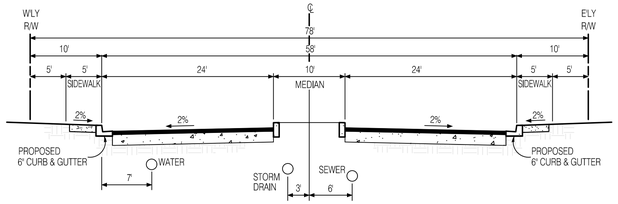
REGISTERED PROFESSIONAL ENGINEER
EDWARD J. LENTH
No. 052496
Exp. 12-31-22
CIVIL
STATE OF CALIFORNIA

8-6-21
EDWARD J. LENTH RCE 052496
EXP. DATE: DECEMBER 31, 2022

LAKESIDE
TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES
TENTATIVE TRACT MAP
CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
SHEET 1 OF 6

TTM NO. 38116 - TENTATIVE TRACT MAP

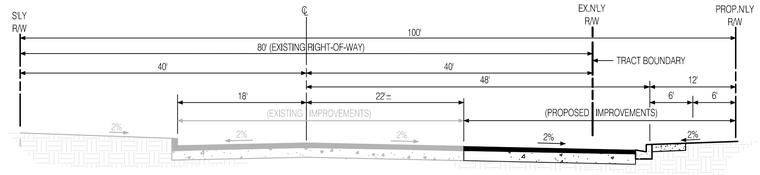
MDS Proj. Data: I:\89490\PLANNING Plans\TTM
Created: 08.05.2021 11:37:16 AM Author:—
Last Edit: 08.05.2021 11:37:49 AM By: STATION39
MDS File: 89490-TENT-01.dwg
Plot Scale: 1" = 1' Dwg Scale: 1" = 60'
Plot Date: 08.05.2021 3:33:54 PM By: STATION39



STREET "A" (PRIVATE)

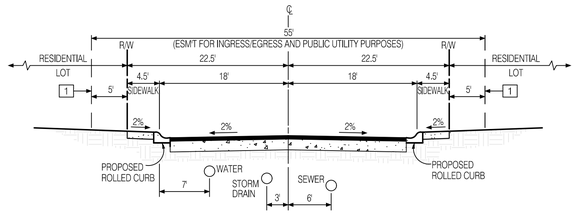
(MODIFIED LOCAL RESIDENTIAL STREET)

SCALE 1"=10'



PROPOSED GRAND AVENUE (PUBLIC)

SCALE 1"=10'

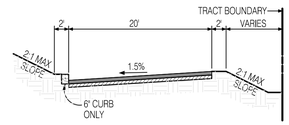


STREETS "B" - "D" (PRIVATE)

(MODIFIED LOCAL RESIDENTIAL STREET)

SCALE 1"=10'

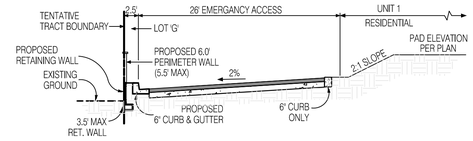
[1] ESM'T FOR INGRESS/EGRESS AND PUBLIC UTILITY PURPOSES



ACCESS ROAD (PRIVATE)

FOR WATER QUALITY BASIN

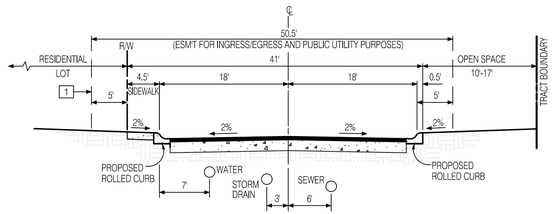
NTS



PROPOSED 26' EMERGENCY ACCESS ROAD

(PRIVATE)

NTS

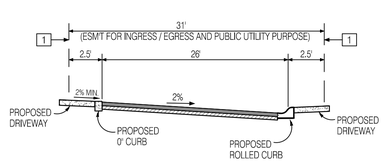


STREET "E" (PRIVATE)

(MODIFIED LOCAL RESIDENTIAL STREET)

SCALE 1"=10'

[1] ESM'T FOR INGRESS/EGRESS AND PUBLIC UTILITY PURPOSES

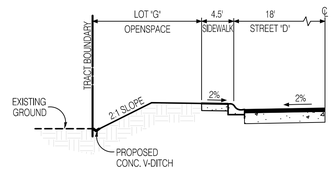


STREETS "F", "G", "H" & "I" (PRIVATE)

FOR LOTS 120 AND 138

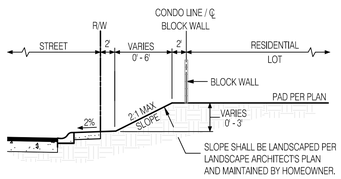
NTS

[1] ESM'T FOR INGRESS/EGRESS AND PUBLIC UTILITY PURPOSES



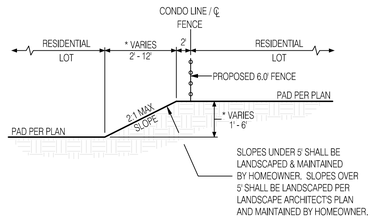
SECTION C-C

NTS



TYPICAL SIDE-YARD SLOPE SECTION AT STREET CORNER LOT

NTS



TYPICAL REAR-YARD SLOPE SECTION

NTS

DATE:	NO.	REVISIONS

PREPARED FOR:

tri pointe HOMES

1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:

MDS CONSULTING — MORSE SCHULTZ

17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821

PLANNERS ENGINEERS SURVEYORS

LAKESIDE
TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES
TENTATIVE TRACT MAP
CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

TTM NO. 38116 - TENTATIVE TRACT MAP

MDS Proj. Data: I:\89490\PLANNING Plans\TTM
Created: 08.05.2021 01:53:31 PM Author:----
Last Edit: 08.05.2021 01:53:31 PM By: STATION39

MDS File: 89490-TENT-02.dwg
Plot Scale: 1" = 1' Dwg Scale: 1" = 60'
Plot Date: 08.05.2021 3:34:10 PM By: STATION39

MATCHLINE (SEE SHEET 5)

STREET "D" (PRIVATE)

STREET "C" (PRIVATE)

STREET "B" (PRIVATE)

STREET "A" (PRIVATE)

STREET "E" (PRIVATE)

LOT 1
10.71 AC

LOT "B"
REC LOT
0.33 AC

LOT "A"
REC LOT
0.44 AC

LOT "D"

LOT "F"
OPENSPACE
0.04 AC

LOT "E"
OPENSPACE
0.04 AC

EXISTING CONCRETE SLAB TO BE REMOVED

PROPOSED GATED ENTRY

EXISTING UTILITY POLES TO BE REMOVED AND UNDERGROUNDED

EXISTING 6.0' CHAIN LINK FENCE TO REMAIN

N52°52'18"W 739.98'

N40°52'49"E 895.43'

OPENSPACE

FLOOD CONTROL CHANNEL
(RCFC & WCD)

APN: 379-060-07
APN: 379-060-08

MATCHLINE (SEE SHEET 4)

GRAND AVENUE (HWY 74)

GRAPHIC SCALE
0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

DATE:	NO.	REVISIONS

PREPARED FOR:

tri pointe HOMES
1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:

MDS CONSULTING
MORSE SCHULTZ
17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821
PLANNERS ENGINEERS SURVEYORS

LAKESIDE
TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES
TENTATIVE TRACT MAP
CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
SHEET 3 OF 6

TTM NO. 38116 - TENTATIVE TRACT MAP

MDS Proj. Data: I:\89400\PLANNING\Plans\TTM
Created: 08.05.2021 11:45:39 AM Author:----
Last Edit: 08.05.2021 11:45:39 AM By: STATION39

MDS File: 89400-TENT-03.dwg
Plot Scale: 1" = 1' Dwg Scale: 1" = 60'
Plot Date: 08.05.2021 3:34:25 PM By: STATION39

APN: 379-060-29
MOBILE HOMES

LOT "G"
OPENSPACE
0.45 AC

N52°55'29"W 716.85'

PROPOSED 26' WIDE ACCESS ROAD
8.0 AC

STREET "C"
(PRIVATE)

STREET "D"
(PRIVATE)

STREET "C"
(PRIVATE)

STREET "D"
(PRIVATE)

STREET "B"
(PRIVATE)

LOT 1
10.71 AC

LOT 1
10.71 AC

MATCHLINE
(SEE SHEET 5)

MATCHLINE
(SEE SHEET 3)

RIVERSIDE DRIVE

PROPOSED GATED
SECONDARY ACCESS

APN:
379-050-41
VACANT

GRAND AVENUE

GRAND AVENUE (HWY 74)

D=64°27'14"
L=748.08'
R=665.00

D=16°57'18"
L=162.76'
R=550.00

N52°46'36"W
33.61'

EXISTING UTILITY POLES TO REMAIN

EXISTING UTILITY POLES TO
BE REMOVED AND UNDERGROUNDED

PROPOSED GATE
ENTRY

EX 4" GAS

EX 10" S

EX 14" W

BRUSH

RECENTLY TILLED

GRAPHIC SCALE
0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

LAKESIDE
TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES
TENTATIVE TRACT MAP
CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

SHEET 4 OF 6

DATE:	NO.	REVISIONS

PREPARED FOR:
tri pointe HOMES
1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:
MDS CONSULTING
MORSE SCHULTZ
17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821
PLANNERS ENGINEERS SURVEYORS

TTM NO. 38116 - TENTATIVE TRACT MAP

MDS Proj. Data: I:\89490\PLANNING\Plans\TTM
Created: 08.05.2021 11:14:21 AM Author:-----
Last Edit: 08.05.2021 11:21:22 AM By: STATKN39

MDS File: 89490-TENT-04.dwg
Plot Scale: 1" = 1' Dwg Scale: 1" = 60'
Plot Date: 08.05.2021 3:34:38 PM By: STATKN39

MATCHLINE (SEE SHEET 6)

N49° 07' 11"W 24.87'

LOT 2
PRESERVED
NATURAL OPEN SPACE
15.65 AC

RECENTLY TILLED

FAULT LINE

50' SETBACK

50' SETBACK

N40°52'49"E 895.43'

FLOOD CONTROL CHANNEL
(RCFC & WCD)

N6°15'44"E 232.48'

N52°26'45"W 80.30'

APN: 379-060-29
MOBILE HOMES

LOT "G"
OPENSPACE
1.90 AC

161.20'

N37°33'15"E

PROPOSED 20' STORM DRAIN EASEMENT

BOTTOM ELEVATION: 1270.5

LOT "C"
WATER QUALITY BASIN
1.33 AC

PROPOSED 20' STORM DRAIN EASEMENT

PROPOSED 20' STORM DRAIN EASEMENT

LOT 1
10.71 AC

STREET "F" (PRIVATE)

STREET "G" (PRIVATE)

STREET "H" (PRIVATE)

STREET "I" (PRIVATE)

20' BASIN ACCESS ROAD

N52°55'29"W 716.85'

STREET "D" (PRIVATE)

BRUSH

STREET "D" (PRIVATE)

EXISTING CONCRETE SLAB TO BE REMOVED

RUIN

LOT 1
10.71 AC

LOT "B"
REC LOT
0.33 AC

STREET "E" (PRIVATE)

MATCHLINE (SEE SHEET 3)

DEBRIS

LOT "D"
OPENSPACE
0.12 AC

GRAPHIC SCALE
0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

DATE:	NO.	REVISIONS

PREPARED FOR:
tri pointe HOMES
1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:
MDS CONSULTING
MORSE SCHULTZ
17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821
PLANNERS ENGINEERS SURVEYORS

LAKESIDE
TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES
TENTATIVE TRACT MAP
CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA
SHEET 5 OF 6

TTM NO. 38116 - TENTATIVE TRACT MAP

MDS Proj. Data: X:\89490\PLANNING\Plans\TTM
Created: 08.04.2021 05:48:02 PM Author:----
Last Edit: 08.04.2021 05:48:19 PM By: STATION39

MDS File: 89490-TENT-05.dwg
Plot Scale: 1" = 1'
Dwg Scale: 1" = 60'
Plot Date: 08.05.2021 3:34:51 PM By: STATION39

GRAPHIC SCALE

0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

DATE:	NO.	REVISIONS

PREPARED FOR:

tri pointe HOMES

1250 Corona Pointe Court
Suite 600
Corona, CA 92879
(951) 428-4400

PREPARED BY:

MDS CONSULTING
MORSE SCHULTZ

17320 Redhill Avenue
Suite 350
Irvine, CA 92614
Voice: 949-251-8821

PLANNERS ENGINEERS SURVEYORS

LAKESIDE

TENTATIVE TRACT NO. 38116
FOR CONDOMINIUM PURPOSES

TENTATIVE TRACT MAP

CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Western Riverside Area, California

Lakeside Tr No 38116

March 24, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 13, May 27, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 17, 2018—Jun 28, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
156	Hanford sandy loam, 2 to 9 percent slopes	7.8	13.2%
GaC	Garretson very fine sandy loam, 2 to 8 percent slopes	24.3	41.2%
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	8.4	14.1%
W	Water	18.6	31.5%
Totals for Area of Interest		**59.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Western Riverside Area, California

156—Hanford sandy loam, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: snp7
Elevation: 150 to 900 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: sandy loam
H2 - 14 to 50 inches: loamy sand
H3 - 50 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: R019XD035CA
Hydric soil rating: No

Minor Components

Capistrano, sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Corralitos, loamy sand
Percent of map unit: 5 percent
Hydric soil rating: No

Garretson, gravelly fine sandy loam
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, less sloping or steeper soils
Percent of map unit: 2 percent
Hydric soil rating: No

GaC—Garretson very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting
National map unit symbol: hcv2
Elevation: 430 to 1,740 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 220 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Garretson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Garretson

Setting
Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metasedimentary rock

Typical profile
H1 - 0 to 10 inches: very fine sandy loam
H2 - 10 to 60 inches: loam

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R019XD029CA
Hydric soil rating: No

Minor Components

Arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Perkins

Percent of map unit: 5 percent
Hydric soil rating: No

Cortina

Percent of map unit: 5 percent
Hydric soil rating: No

GtA—Grangeville fine sandy loam, drained, 0 to 2 percent sl opes

Map Unit Setting

National map unit symbol: hcvn
Elevation: 10 to 1,800 feet
Mean annual precipitation: 12 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 200 to 270 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Grangeville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Grangeville

Setting

Landform: Alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 36 inches: fine sandy loam
H2 - 36 to 64 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A/D
Ecological site: R019XD070CA - SANDY BASIN
Hydric soil rating: No

Minor Components

Dello

Percent of map unit: 10 percent
Hydric soil rating: No

Traver

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

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Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Bioretention Facility - Design Procedure	BMP ID: BMP A	Legend:	Required Entries / Calculated Cells

Company Name:	MDS Consutling	Date:	8/5/2021
Designed by:	Abbegail Roman-Esperanza	County/City Case No.:	Tr 38116

Design Volume

Enter the area tributary to this feature	A_T=	19.16	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	27,712	ft^3

Type of Bioretention Facility Design

(●) Side slopes required (parallel to parking spaces or adjacent to walkways)

( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	30.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$	d_E =	1.78	ft
Minimum Surface Area, A_m $A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	15,598	ft^2
Proposed Surface Area	A=	17,632	ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet
Describe Vegetation:		Shrubs	

Notes:

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

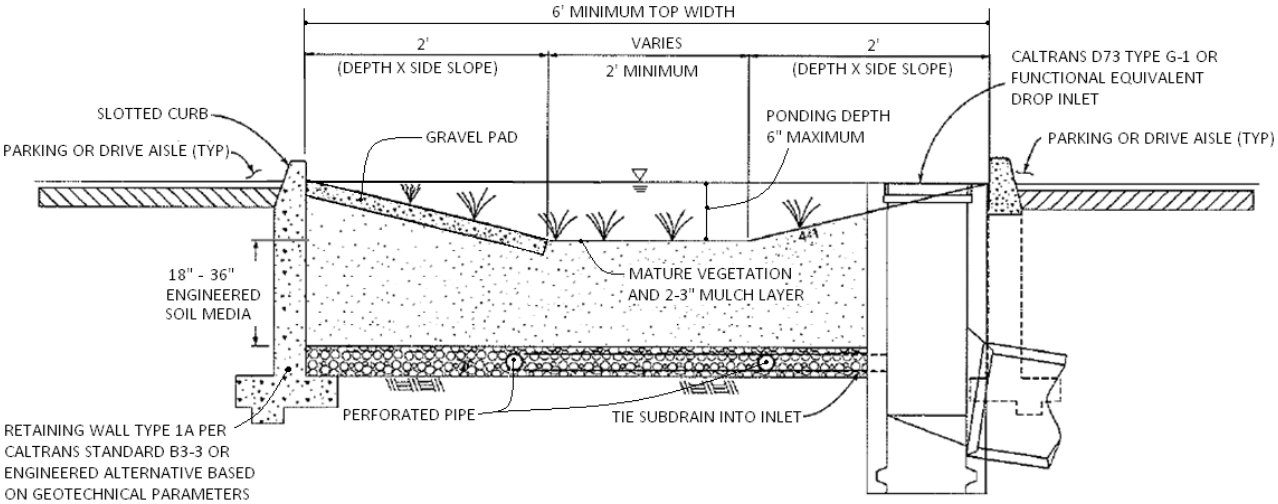
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

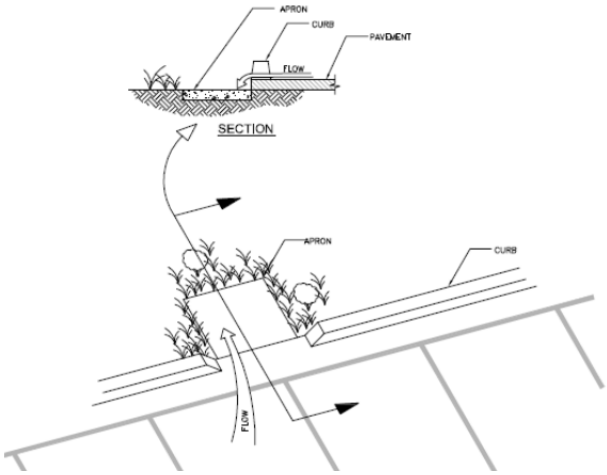


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

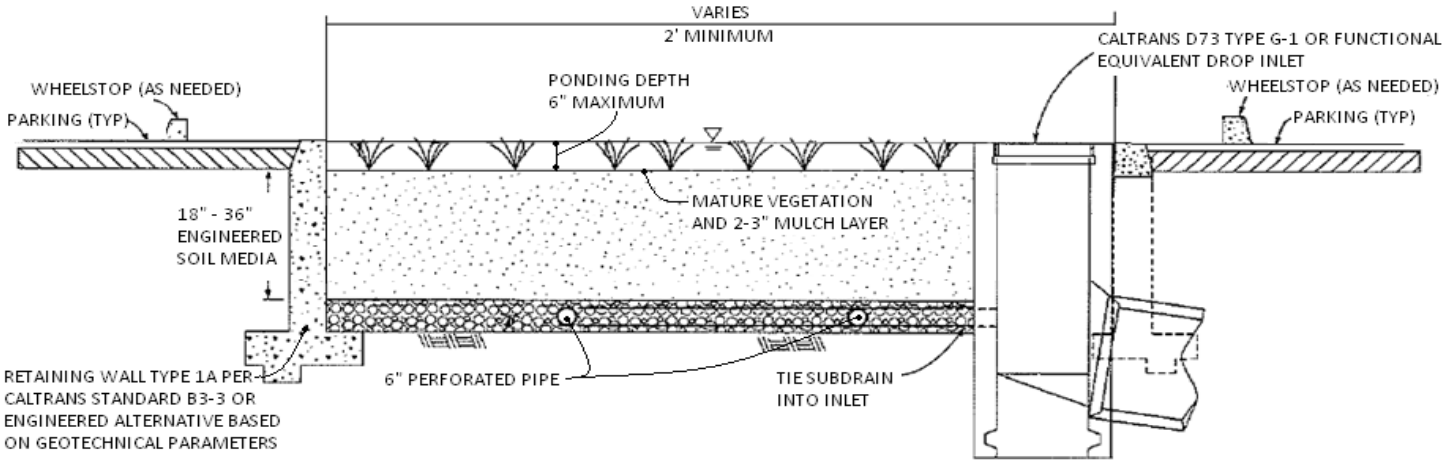
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

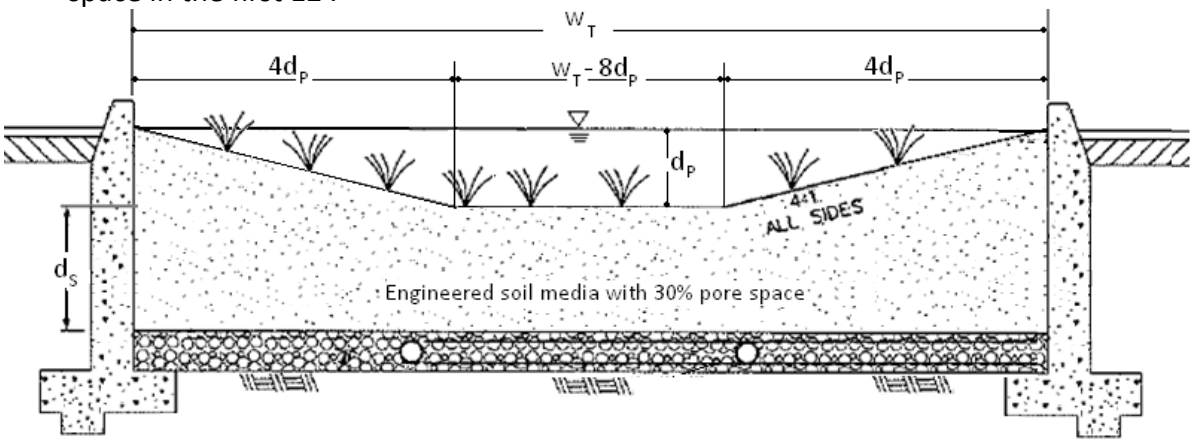
2) Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(\text{ft}) = d_P(\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = 0.5\ (\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(\text{ft}^2) = \frac{V_{BMP}(\text{ft}^3)}{d_E\ (\text{ft})}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

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Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

Lake Watch - State of Lake Elsinore

Proactively Preparing to Preserve and Protect Lake Elsinore

Current Status of Lake Elsinore

Update as of September 4, 2020- NOTE: Page only updated if the status changes. See below for any advisories currently related to Cyanobacteria, i.e. Harmful Algae Blooms.

Status of the Lake: Lake Elsinore is open and safe for all recreational uses including boating, fishing, kayaking and more. The City and State regularly samples and monitors the Lake as needed to ensure the health and safety of Lake Elsinore. Updates are posted as they become available and are necessary should the condition of the lake change.

Latest Cyanobacteria Information: The last Cyanobacteria sampling event for the Lake took place on August 31, 2020. Cyanobacteria, or Blue-Green Algae, were detected. In particular, microcystins were detected at higher levels at Elm Grove Beach and the Inlet Channel near Diamond Stadium. All other areas of the lake including the center of the Lake, Perret Park and at Launch Pointe only showed low levels of Cyanobacteria. These areas were within the Caution level. The Inlet Channel (none swimming area) was at the Danger level, while Elm Grove Beach was at the warning level set by the State.

See latest water monitoring results and advisories available on the State's Harmful Algae Bloom Portal. Be sure to scroll to Lake Elsinore or Riverside County to view details.

At the request of the State Water Control Board, all recreational advisory signs around the lake have been updated in these areas accordingly to alert visitors of possible risks associated with recreation in the lake. These postings and notification from the State are only recommended at this time. Precautions are always recommended when algae/scum are visible in the lake including:

- Do not swim or wade near algae or scum
- Keep children away from algae in the water or on the shore.
- Do not drink this water or use it for cooking.
- Do not let your dog drink, wade or swim in HAB-affected water (read more)
- For fish caught here, throw away guts and clean fillets with water before cooking.

Lake Elsinore has historically been vulnerable to algae blooms, but only began sampling for or learning about Cyanobacteria concerns in 2016. Sampling is only conducted as needed based on the state of the lake.

View Trigger Levels determined by the State

View Caution (Espanol), Warning (Espanol) and Danger (Espanol) Signs

State Website regarding Harmful Algae Blooms (HAB) - Zoomed in HAB Map of Lake Elsinore

Find out more about Cyanobacteria, i.e. Harmful Algae Blooms

Harmful Algae Bloom Fact Sheet and FAQs

Read an FAQ regarding Posted Signs Related to Harmful Algae Blooms

Physician Fact Sheet

Dog Owners Fact Sheet

Previous Sample Dates:

April 2020 - Minor toxins detected, caution levels.

July 2020 - Minor toxins detected below caution levels.

This year's rains have benefited our lake tremendously. In fact, the water levels are higher than they have been since June 2012. Between October 2019 and April 2020, the lake rose 6 feet to well above our optimal lake level of more than 1240'. This increased water level has been helpful this summer as the hotter weather brings a higher probability of fish kills and algae blooms. As such, overall the water quality has been greatly improved this year.

Lake Elsinore is located at the bottom of the 720 square-mile San Jacinto Watershed. Rainfall throughout this area flows downstream through various tributaries into Canyon Lake before spilling into Lake Elsinore. This "run-off" brings critical water supply for the lakes, but is also susceptible to carrying with it nutrients and sediment that can be detrimental to the lakes' water quality over time by encouraging algae growth.

About Lake Elsinore's Health

Lake Elsinore is Southern California's Largest Natural, Freshwater Lake. Faced with a historic drought, extremely low water levels, higher temperatures, and an abundance of shad, the City has become increasingly concerned about the health of the lake and the vitality of the fishery.

In 2015, in an effort to be proactive and prepared, the City partnered with the Lake Elsinore & San Jacinto Watersheds Authority (LESJWA) launched Lake Watch 2015 to create awareness and engage the community, local and regional resource agencies and private businesses to take part in our efforts to prepare for and address the vulnerability of Lake Elsinore.

The City started its Lake Watch efforts to get prepared and regularly inform the community about the health and concerns of our most valuable asset - Lake Elsinore. While the City and the Elsinore Valley Municipal Water District each spend more than $750,000 per year to add 5 million gallons of recycled water to the lake each day, it is not enough to offset evaporation. In 2016, lake's water level declined to its lowest levels since early 1993 and was extremely vulnerable to algae blooms and subsequent fish kills. At this time, we suffered our first detected blue-green algae bloom.

In 2017, storms helped to replenish the lake and the water quality greatly improved. However, 2018 was amongst one of our driest years on record and the lake levels have once again declined well below the optimal level of 1240'. Ultimately, the lake needs more rain and the City remains diligent in monitoring the lake's health and working toward long-term options to improve the overall health of Lake Elsinore.

Algae & Algae Blooms

Algae are large photosynthetic organisms and are normal habitats of large bodies of water like a lake. Algae are very important to both freshwater and marine environments and most species are harmless under normal circumstances. Cyanobacteria are known as "blue-green algae" are actually bacteria and not a form of Algae. Algae

and Cyanobacteria have very similar characteristics with the difference that certain Cyanobacteria toxins can be harmful to the environment, animals and human health.

Algae blooms occur when the algae grow at rapid speeds than normal causing dense accumulations in the water. Algae blooms are normal occurrences in bodies of water. They can become harmful when there is excessive growth. As the cyanobacteria die off, harmful toxins can be produced known as cyanotoxins Concerns regarding blue-green algae have been on the rise throughout the Country and California including Pyramid Lake, Discovery Bay, Lake Elsinore, and Silverwood Lake.

Find out more about Cyanobacteria, i.e. Harmful Algae Blooms

Read an FAQ regarding Posted Signs Related to Harmful Algae Blooms

Fish Kills

In 2015, a fish survey conducted on behalf of LESJWA found that Lake Elsinore's fishery is imbalanced due to an overpopulation of Threadfin Shad. Shad are small, highly sensitive fish that hinder the water quality by eating microscopic zooplankton, which consume algae. With Shad feeding on the zooplankton in the lake, there will likely be an algae bloom thus reducing dissolved oxygen. Such conditions, ultimately lead to the demise of this delicate fish. It is nature's way to rebalance the fish population and improve the overall health and quality of the lake.

Since 2000, the City and LEJSWA in coordination with its partner agencies have greatly improved water quality and wildlife habitats in Lake Elsinore, as well as in the surrounding watershed. Successful projects to date include the following:

- Lake Elsinore Wetlands Enhancement Project
- Lake Elsinore Carp Removal
- Island Wells Pump Station Improvements
- Striped Bass Stocking
- Lake Elsinore Destratification & Mixing System
- Recycled Water Nutrient Removal & Conveyance Pipeline
- Lake Habitat Improvements

Despite these efforts, Lake Elsinore is a natural lake. Recent conditions have created a poor ecological condition for the lake that is difficult to sustain. A fish kill is one of Nature's ways of rebalancing the food chain. While there is no indication currently that an event is imminent, the probability is high.

In 2015 and 2018, Lake Elsinore did suffer a moderate fish kill. The City remains prepared and regularly monitors the dissolved oxygen in the lake for signs of concern.

Lake Watch

Lake Elsinore is an extremely complex, unique water body. It is a show lake that struggles due to increasing temperatures, recent algae blooms, and declining dissolved oxygen levels during the hotter months. Unfortunately, there is little the City or LESJWA can do to improve its current condition without a stable and reliable water level of above 1240'.

Lake Watch is focused on ensuring the City, regional partners and the community is ready and prepared for any potential concerns related to the vulnerability of Lake Elsinore including declining lake levels, algae blooms and the potential of a fish kill.

As part of ***Lake Watch,*** the City of Lake Elsinore and LESJWA asks the community and visitors to monitor the lake and notify the City should you notice anything abnormal including algae blooms or dead fish floating in the lake or washed up on shore.

To report, please call 951-674-3124 ext. 204, email pio@lake-elsinore.org or message the City at www.Facebook.com/CityofLakeElsinore.

NEWS

City Hall Reopens to the Public, Appointments Urged
4/9/2021 4:38:00 PM

Measure Z Takes Effect April 1, 2021
4/5/2021 11:08:00 AM

New Round of Rental Assistance for Those in Need
3/8/2021 9:40:00 AM

EVENTS

Planning Commission
04/20/2021 6:00 PM

Public Safety Advisory Commission
04/21/2021 6:00 PM - 7:30 PM

City Council/Successor Agency Meeting
04/27/2021 7:00 PM - 9:00 PM

Lake Elsinore Replenishment Level Study Alternative Analysis

May 2001
Revised June 2002

Prepared for:
The Elsinore Valley Municipal Water District

Prepared by:

TETRA TECH, INC.
Infrastructure Services Group

EXECUTIVE SUMMARY

The Elsinore Valley Municipal Water District has a direct interest in the maximum lake replenishment level as specified in the Lake Management Plan. An increase in the lake replenishment level would improve the water quality of the lake. This study was completed in order to determine the impacts of different lake replenishment levels on the 100-year water surface elevation.

The Los Angeles District of the Corps of Engineers (LADCOE) completed a Definite Project Report (DPR) in 1988 recommending an improved Lake Elsinore outlet channel with a sill at elevation 1255. This project was economically justified with a 100-year maximum lake elevation of 1262.0. The City of Elsinore and Elsinore Valley Municipal Water District constructed the Lake Management Plan in 1991-1992, which divided the Lake into a Main Lake and a Back Basin with Back Basin weir having an ultimate elevation of 1262.0. LADCOE published a Supplemental Report to the DPR in 1991 that took into account the Lake Management Plan. This report established a 100-year maximum lake elevation of 1263.3 based on an outlet channel with a sill at 1255 and a lake replenishment level of 1240. The Local Cooperation Agreement (LCA) between LADCOE and Riverside County Flood Control and Water Conservation District (RCFC&WCD) was based on this configuration. The outlet channel improvements were completed in October 1994.

The Lake Management Plan sponsors have a need to establish a more flexible upper limit of lake operating level for water quality and environmental reasons and for operational considerations. Black & Veatch (B&V) completed the *Lake Elsinore Operating Range Report* in 1995. This report stated that a lake replenishment level of 1245 would result in no appreciable difference in computed maximum water surface elevations for extreme events within the historical record. The report also hinted that "make-up" water could be added to elevation 1249 toward the end of the rainy season with no adverse impacts. LADCOE reviewed the B&V report under a Memorandum of Agreement with RCFC&WCD and submitted a report in 1997. The LADCOE report stated that for a replenishment level up to elevation 1245, there would be no impact on the 100-year maximum lake elevation, but there would be an impact of higher 100-year water surface elevations for replenishment levels of 1247 and 1249. The report further stated that there would be downstream impacts for operating levels of 1245 and higher.

Our analysis builds on the previous work utilizing essentially the same basic HEC-5 computer models and routing procedures while extending the period of analysis through year 1999, giving 84 years of record upon which to base probability-elevation estimates for various lake operating levels. Using the latest PC version of HEC-5, which provides evaporation output data for short duration routings, the simulation results for the existing condition lake replenishment level of 1240 were found to be consistent with previous results.

Period of record analyses were performed for maximum lake operating levels from 1241 to 1249 in one-foot increments, plus elevation 1248.5. The 84 annual maximum simulated lake elevations were tabulated and ranked, and then the storage-elevations were plotted in an exceedance probability relationship using median plotting positions.

Previous studies by LADCOE and John M. Tettimer and Associates (JMTA) have constructed smooth curves and regression equations to estimate the 100-year maximum lake elevations. In this analysis, however, final results are estimated by constructing a best-fit line for the plotted data. This method is deemed the most appropriate because the distribution of the data cannot be defined by a smooth graphical curve or an analytical expression on account of the regulated nature of the data. With 84 years of record, the largest event plots beyond the 100-year exceedance frequency thereby providing a firm value for the 100-year lake elevation estimate. This method has no predictive qualities and cannot be used to estimate values beyond the range of data.

Based on this best-fit analysis, a lake replenishment level of up to elevation 1248.5 will result in an estimated 100-year maximum lake elevation of 1263.3, which is the current accepted 100-year maximum lake elevation. A lake replenishment level of 1249 will result in a 100-year estimated maximum lake elevation of 1263.42.

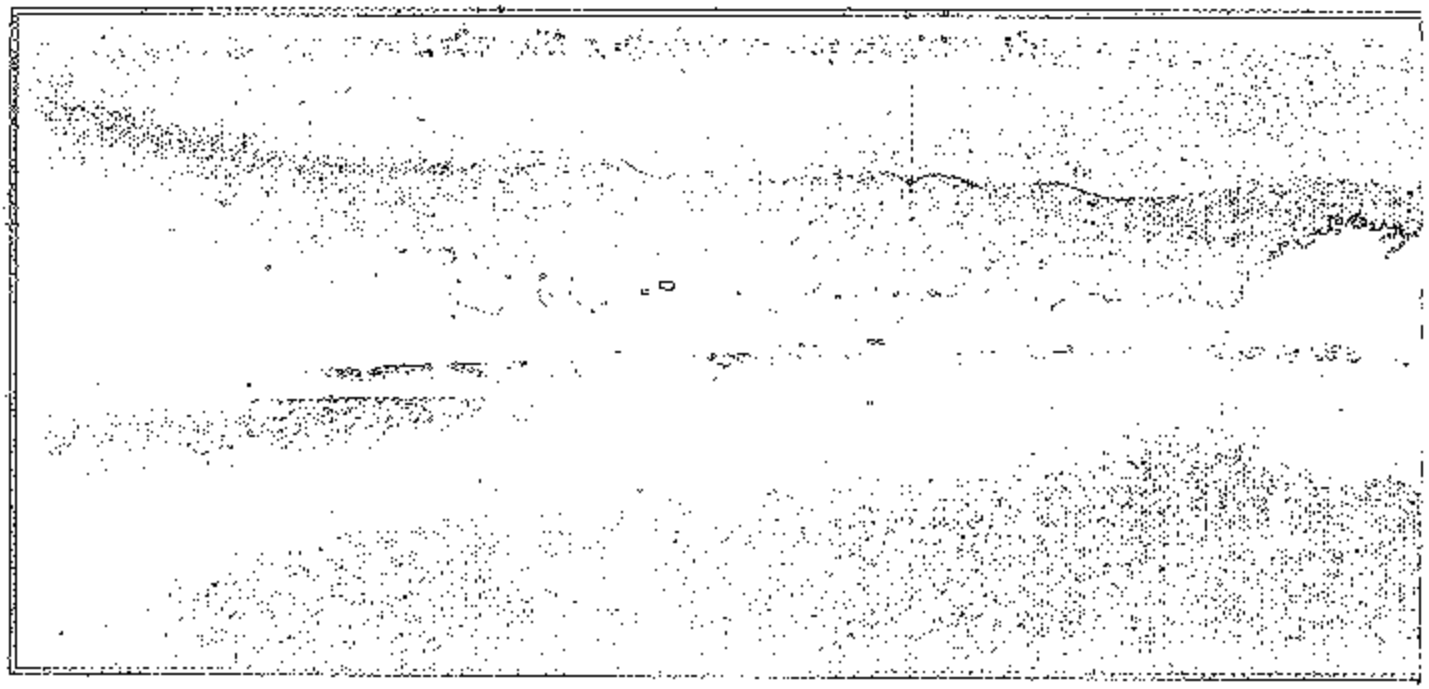
There are downstream increases in flow magnitude and duration for all alternative operating levels higher than 1240. This report does not address any specific impacts, but provides tables of flow magnitude and duration for lake replenishment levels of 1240, 1245, 1247, and 1249 for the 14 events in the period of record that produce lake outflow.

Elsinore Valley Municipal Water District

Final Report

Engineering Feasibility Study for NPDES Permit for Discharge to Lake Elsinore

February 2002



MWH
MONTGOMERY WATSON HARZA

MWH
MONTGOMERY WATSON HARZA

February 18, 2002

Mr. Phil Miller, PE
District Engineer
Elsinore Valley Municipal Water District
PO Box 3000
31315 Chaney Street
Lake Elsinore, CA 92531-3000

Subject: Engineering Feasibility Study for
NPDES Permit for Discharge to Lake Elsinore

Dear Mr. Miller:

MWH Americas, Inc. is pleased to submit the final report on Engineering Feasibility Study for NPDES Permit for Discharge to Lake Elsinore.

This report recommends using reclaimed water to make up for evaporative losses in Lake Elsinore and to stabilize the lake level. A phased approach for in-lake treatment is presented. Specifically, the recommendations include, in sequence:

- Oxygenation to increase dissolved oxygen in bottom waters and to substantially reduce the release of nitrogen and phosphorus from the nutrient rich bottom sediments.
- Biomanipulation through fish harvesting and macrophyte growth to favor increased population growth of *Daphnia*, which feed on algae.
- Wetlands treatment to filter out algae during the summer and lower the nutrient level of reclaimed water during the winter.
- Metal salt addition, such as sodium carbonate, may be considered as a last resort if the above three methods show limited success.

We are pleased for this opportunity to be of service and be part of this challenging project.

Sincerely,

MWH AMERICAS, INC.

Ajit S. Bhamrah, PE
Principal-in-Charge

ASB:bh

301 North Lake Avenue
Suite 600
Pasadena, California
91101

Tel: 626 796 9141
Fax: 626 568 6101

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see Instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	**... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE**		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **A.** On-site storm drain inlets	☒ Locations of inlets.	☒ Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	☒ Maintain and periodically repaint or replace inlet markings. ☒ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ☒ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ☒ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
☐ **B.** Interior floor drains and elevator shaft sump pumps		☐ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.
☐ **C.** Interior parking garages		☐ State that parking garage floor drains will be plumbed to the sanitary sewer.	☐ Inspect and maintain drains to prevent blockages and overflow.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **D1.** Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	☐ Provide Integrated Pest Management information to owners, lessees, and operators.
☒ **D2.** Landscape/ Outdoor Pesticide Use	☐ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ☐ Show self-retaining landscape areas, if any. ☐ Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. ☐ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ☒ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ☐ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ☒ Consider using pest-resistant plants, especially adjacent to hardscape. ☐ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	☒ Maintain landscaping using minimum or no pesticides. ☒ See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/Error! Hyperlink reference not valid. ☒ Provide IPM information to new owners, lessees and operators.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **E.** Pools, spas, ponds, decorative fountains, and other water features.	☒ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	☒ See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ **F.** Food service	☐ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ☐ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	☐ Describe the location and features of the designated cleaning area. ☐ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	☐ See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
☐ **G.** Refuse areas	☐ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ☐ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ☐ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	☐ State how site refuse will be handled and provide supporting detail to what is shown on plans. ☐ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	☐ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **H.** Industrial processes.	☐ Show process area.	☐ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	☐ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	☐ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ☐ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ☐ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank www.cchealth.org/groups/hazmat/	☐ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☒ **J.** Vehicle and Equipment Cleaning	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitaty sewer, or a wastewater reclamation system shall be installed.**	☒ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☒ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ☐ **Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **L.** Fuel Dispensing Areas	☐ Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ☐ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 **Potential Sources of Runoff Pollutants**	2 **Permanent Controls—Show on WQMP Drawings**	3 **Permanent Controls—List in WQMP Table and Narrative**	4 **Operational BMPs—Include in WQMP Table and Narrative**
☐ **M.** Loading Docks	☐ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ☐ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ☐ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on WQMP Drawings**	**3** **Permanent Controls—List in WQMP Table and Narrative**	**4** **Operational BMPs—Include in WQMP Table and Narrative**
☐ **N.** Fire Sprinkler Test Water		☐ Provide a means to drain fire sprinkler test water to the sanitary sewer.	☐ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources ☐ Boiler drain lines ☐ Condensate drain lines ☐ Rooftop equipment ☐ Drainage sumps ☒ Roofing, gutters, and trim. ☐ Other sources		☐ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ☐ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ☐ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ☐ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ☐ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ **P.** Plazas, sidewalks, and parking lots.			☒ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Non-Structural Source BMP Operation and Maintenance

BMP Description	Responsible Party	Procedure and Inspection Requirements	Frequency/Schedule
Education for Property Owners, Operators, Tenants, Occupants, or Employees	Developer then HOA	Educational materials will be available to employees, maintenance crews and contractors. Materials will include environmental awareness such as proper use of chemicals, discharges of wastes, dry cleaning, catch basins and storm drain maintenance, watershed protection. Provide educational materials on an annual basis and upon hiring of employees or any new tenant	Annually
Activity Restrictions	Developer then HOA	Once project has been turned over, certain restrictions may be enacted thru the formation of conditions and CCRs to protect surface water runoff. Provide copy of WQMP to all employees and contractors that do the maintenance work	Annually
Irrigation System and Landscape Management	Developer then HOA and Property Owners	Inspect all Common landscape areas and replace dead vegetation Properly manage pesticides and fertilizers per City/County Ordinances Inspect, adjust, and repair irrigation system. AB 1881 Compliant	Monthly during regular maintenance. Weekly during regular maintenance. Weekly, during regular maintenance
Common Area Litter Control	Developer then Owner and/or Maintenance Contractors	The HOA will be responsible for funding the common areas and slopes within the development. The City of Lake Elsinore will be responsible funding for areas within public right-of-way or property transferred to City (i.e. detention basins, riparian area, parks). Inspect and remove all litter and debris located in all common areas, including streets, parkways and sidewalks. Empty trash dumpsters located within delivery area.	Weekly
Street Sweeping Public Streets	City of Lake Elsinore	Inspect and remove all litter and debris. Clean up oil spills.	Twice a month

Drainage Facility Inspection and Maintenance	Developer then HOA	Inspect all catch basin and stormdrain pipes, remove litter, debris and any liquids Drainage facilities shall be cleaned if accumulated sediment/debris fills 25% or more of the sediment/debris capacity.	Minimum 3 times annually During the rainy season, beginning October 1st, inspections and maintenance activities shall be required following each rain event.

Structural Source Control BMP Operation and Maintenance

BMP Description	Responsible Party	Procedure and Inspection Requirements	Frequency/Schedule
MS4 Stenciling and Signage	Developer then City of Lake Elsinore	Tri Pointe Homes (property owner) to provide stenciling or labeling of all storm drain inlets and catch basins for one year following completion of construction. At that time, the public storm drain inlets shall be maintained by the City of Lake Elsinore. Catch Basin Stenciling shall include prohibitive language such as: "NO DUMPING, ONLY RAIN IN THE DRAIN" and/or graphical icons to discourage illegal dumping. Inspection/maintenance of the storm drain stenciling may be performed by the City employees or contracted maintenance personnel. During inspection, the inspector(s) shall check for the maintenance indicators given below: • Faded, vandalized, or otherwise unreadable concrete stamping There are no routine maintenance activities for the concrete stamping. If inspection indicates the storm drain stenciling is intact, no action is required. If inspection indicates the concrete stamping is not legible, the storm drain stenciling shall be repaired or replaced, as necessary.	Every 6 months or as needed
Use efficient irrigation and landscape design	Developer then Owner and HOA	Inspect and repair landscape irrigation timers. Inspect and repair all sprinkler heads as needed. Remove and replace dead vegetation as needed.	Weekly

Protect Slopes and Channels	Developer then HOA	The HOA will be responsible for funding of the protection of slopes and channels within the development. HOA will be responsible for funding of areas within property transferred to HOA/ County Transportation (i.e. detention basins, riparian area, parks). Inspect Slopes for erosion for earthen or landscaped slopes. Inspect falling debris for stabilized slopes with reinforcing materials. Repair slopes whenever necessary.	Weekly and whenever necessary
Trash Storage Areas	Developer then Owner	A private contract shall be prepared between the HOA and CR&R, Incorporated (the current Trash Company). Listed below are minimal requirements from the Riverside County Water Quality Management Plan: • Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent offsite transport of trash. • Trash dumpsters shall be leak proof and have attached covers or lids. • Connection of trash area drains to MS4 is prohibited. • Trash compactors shall be roofed and set on a concrete pad. The pad shall be minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.	Weekly
Post Development Site Design BMP Operation and Maintenance			
BMP Description	**Responsible Party**	**Procedure and Inspection Requirements**	**Frequency/Schedule**

Bioretention Basins	Developer then HOA	The BMP sizing calculations and design details for the proposed Bioretention Basins are located in Section VIII, Appendix F. The Bioretention Basins shall be maintained on a quarterly basis and prior to the rainy season, October 1st of each year. The basin shall be inspected for the following maintenance indicators: Maintenance procedures for the basin include: • Remove debris and gross pollutants from the entire basin and structural facilities. • The basin side slopes should be mowed at least twice a year to discourage woody growth. After the first or second growing season, the side slopes should be evaluated to determine if reinforcement planting is needed. If needed, the additional planting shall be installed at the onset of the second growing season after construction. • Use of fertilizer, pesticides, and herbicides should be avoided. Appropriate native plant selection and other IPM methods shall be employed to use of such products. • Repair slopes that are eroded or slumping. • Sediment deposit in the basin will monitored after each storm event. Whenever substantial sediment accumulation has occurred, remove accumulated sediment from the bottom of the basin. Removal shall extend to the original basin depth. Accumulated sediment will be tested for heavy metals and organics to determine the appropriate disposal method.	See left.

Bioretention Basins

Tri Pointe Homes (property owner) is responsible for maintaining and funding of the Bioretention basins until they are placed or turned over to the HOA which is the entity responsible for the long-term abatement, trash removal, maintenance, general repairs, etc.

Operation and maintenance will be funded by an HOA. HOA dues will be established sufficient to cover the cost of maintenance into perpetuity. The long term operation and maintenance and funding of the basin shall be determined and the WQMP updated accordingly prior to 1st occupancy.

Developer: Tri Pointe Homes
Address: 1250 Corona Pointe Court, Suite 600
Corona, CA 92879
Contact Person: Michael Heishman
Telephone: (951) 428-4400

Covenant and Agreement

Water Quality Management Plan and Urban Runoff BMP Transfer, Access and Maintenance Agreement

Recorded at the request of:

County of _____

After recording, return to:

County of _____

County Clerk _____

Water Quality Management Plan and Urban Runoff BMP Transfer, Access and Maintenance Agreement

OWNER: _____

PROPERTY LOCATION: _____

APNS: _____

THIS AGREEMENT is made and entered into in

_____, California, this _____ day of

_____, by and between

_____, herein after

referred to as "Owner" and the COUNTY OF _____, a

municipal corporation, located in the County of Riverside, State of California hereinafter

referred to as "COUNTY";

WHEREAS, the Owner owns real property ("Property") in the County of _____, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as _____ within the Property described herein, the City required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, on file with the City, hereinafter referred to as "WQMP", to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff;

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the City;

WHEREAS, said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Owner hereby provides the City of City's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.

4. The City may require the owner to post security in form and for a time period satisfactory to the city to guarantee the performance of the obligations state herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a

surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous Urban Runoff-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as Owner repays to City its reasonable costs incurred in accordance with paragraph 3 above.

5. This agreement shall be recorded in the Office of the Recorder of Riverside County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

6. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

7. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9. Time is of the essence in the performance of this Agreement.

10. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:	**IF TO OWNER:**
_____	_____
_____	_____
_____	_____
_____	_____

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

APPROVED AS TO FORM:

_____
County Attorney

_____
COUNTY OF

Name _____

_____
Title

ATTEST:

_____
County Clerk Date

NOTARIES ON FOLLOWING PAGE

OWNER:

_____
Name

_____
Title
OWNER

_____
Name

_____
Title

EXHIBIT A (Legal Description)

EXHIBIT B
(Map/Illustration)

Bioretention Area Maintenance Plan for
Tract No. 38116

March 2021

Project Address and Cross Streets: East of intersection of Riverside Drive and Grand Avenue.

Assessor's Parcel No.: 379-060-022, portion of 379-060-005, 379-060-027

Property Owner: Tri Pointe Homes Phone No.: (951) 428-4400

Designated Contact: Michael Heishman Phone No.: (951) 428-4400

Mailing Address: 1250 Corona Pointe Court, Suite 600 Corona, CA 92879

The property contains one (1) bio-retention area(s), located as described below and as shown in Post-Construction BMP Plan.

Bioretention Basin No. A is located on Lot "H"

I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to bioretention area failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1
Routine Maintenance Activities for Bioretention Areas

No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from bioretention area and dispose of properly.	Monthly, or as needed after storm events
2	Inspect bioretention area to ensure that it drains between storms and within five days after rainfall.	Monthly, or as needed after storm events
3	Inspect inlets for channels, soil exposure or other evidence of erosion. Clear obstructions and remove sediment.	Monthly, or as needed after storm events
4	Remove and replace all dead and diseased vegetation.	Twice a year
5	Maintain vegetation and the irrigation system. Prune and weed to keep bioretention area neat and orderly in appearance.	Before wet season begins, or as needed
6	Check that mulch is at appropriate depth (3 inches per soil specifications) and replenish as necessary before wet season begins.	Monthly
7	Inspect bioretention area using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

II. Prohibitions

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.

2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.
9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.
10. Unwanted/unused pesticides shall be disposed as hazardous waste.

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact vector control listed below. Mosquito larvicides shall be applied only when absolutely necessary and then only by a licensed professional or contractor. Contact information for vector control is provided below.

III. Vector Control Contacts

Unincorporated areas of Riverside County
Vector Control at Riverside County Environmental Health
951.766.9454

IV. Inspections

The attached Bioretention Area Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Bioretention Area
Inspection and Maintenance Checklist

Property Address: _____ Property Owner: _____

Treatment Measure No.: _____ Date of Inspection: _____ Type of Inspection: Monthly Pre-Wet Season
After heavy runoff End of Wet Season

Inspector(s): _____ Other:_____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	When water stands in the bioretention area between storms and does not drain within five days after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of bioretention area, or added underdrains.
2. Trash and Debris Accumulation	Trash and debris accumulated in the bioretention area.			Trash and debris removed from bioretention area and disposed of properly.
3. Sediment	Evidence of sedimentation in bioretention area.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, and/or other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
6. Mulch	Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 3 inches in depth.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 3 inches.
7. Miscellaneous	Any condition not covered above that needs attention in order for the bioretention area to function as designed.			Meet the design specifications.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

For Information:

Local Sewering Agencies in Riverside County:

City of Beaumont	(909) 769-8520
Belair Homeowners Association	(909) 277-1414
City of Banning	(909) 922-3130
City of Blythe	(760) 922-6161
City of Coachella	(760) 391-5008
Coachella Valley Water District	(760) 398-2651
City of Corona	(909) 736-2259
Desert Center, CSA #51	(760) 227-3203
Eastern Municipal Water District	(909) 928-3777
Elsinore Valley MWD	(909) 674-3146
Farm Mutual Water Company	(909) 244-4198
Idyllwild Water District	(909) 659-2143
Jurupa Community Services Dist.	(909) 685-7434
Lake Hemet MWD	(909) 658-3241
Lee Lake Water District	(909) 277-1414
March Air Force Base	(909) 656-7000
Mission Springs Water District	(760) 329-6448
City of Palm Springs	(760) 323-8242
Rancho Caballero	(909) 780-9272
Rancho California Water Dist.	(909) 676-4101
Ripley, CSA #62	(760) 922-4909
Rubidoux Community Services Dist.	(909) 684-7580
City of Riverside	(909) 782-5341
Silent Valley Club, Inc	(909) 849-4501
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(909) 780-4170

Spill Response Agency:
Haz-Mat: (909) 358-5055
Hazardous Waste Disposal: (909) 358-5055
To Report Illegal Dumping or a Clogged Storm Drain: 1-800-506-2555

StormWater CleanWater
PROTECTION PROGRAM

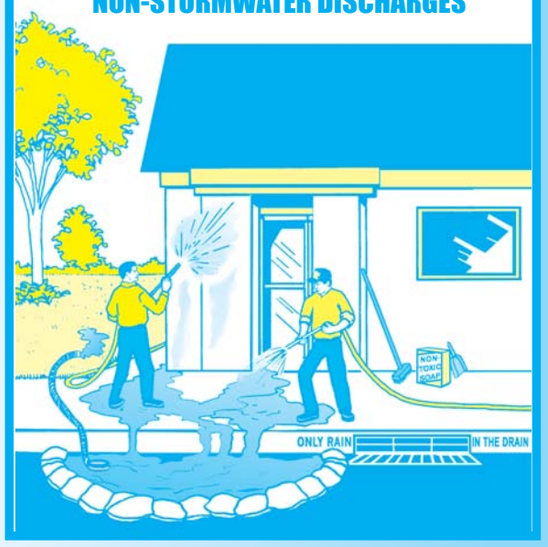
Riverside County gratefully acknowledges the Bay Area Stormwater Management Agencies Association and the Cleaning Equipment Trade Association for information provided in this brochure.

StormWater Pollution

What you should know for...

OUTDOOR CLEANING ACTIVITIES

NON-STORMWATER DISCHARGES



GUIDELINES for disposal of washwater from:

- Sidewalk, plaza or parking lot cleaning
- Vehicle washing or detailing
- Building exterior cleaning
- Waterproofing
- Equipment cleaning or degreasing

Do you know . . . where the water should go?

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to prevent flooding by carrying excess rainwater away from streets. . . it's not designed to be a waste disposal system. Since the storm drain system does not provide for water treatment, it often serves the unintended function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

Non-stormwater discharges such as washwater generated from outdoor cleaning projects often transport harmful pollutants into storm drains and our local waterways. Polluted runoff contaminates local waterways and poses a threat to groundwater resources.

Soaps, degreasers, automotive fluids, litter, and a host of other materials washed off buildings, sidewalks, plazas, parking areas, vehicles, and equipment can all pollute our waterways.

The Cities and County of Riverside StormWater/CleanWater Protection Program

Since preventing pollution is much easier, and less costly than cleaning up "after the fact," the Cities and County of Riverside StormWater/CleanWater Protection Program informs residents and businesses of pollution prevention activities such as those described in this pamphlet.

The Cities and County of Riverside have adopted ordinances for stormwater management and discharge control. In accordance with state and federal law, these local stormwater ordinances **prohibit** the discharge of wastes into the storm drain system or local surface waters. This includes non-stormwater discharges containing oil, grease, detergents, degreasers, trash, or other waste materials.

PLEASE NOTE: The discharge of pollutants into the street, gutters, storm drain system, or waterways - without a Regional Water Quality Control Board permit or waiver - is ***strictly prohibited*** by local ordinances and state and federal law.

Help Protect Our Waterways!

Use These Guidelines For Outdoor Cleaning Activities and Washwater Disposal

DO . . . Dispose of **small amounts** of **washwater from cleaning building exteriors, sidewalks, or plazas** onto landscaped or unpaved surfaces provided you have the owner's permission and the discharge will not cause flooding or nuisance problems, or flow into a storm drain.

DO NOT . . . Discharge **large amounts** of these types of washwater onto landscaped areas or soil where water may run to a street or storm drain. Wastewater from exterior cleaning may be pumped to a sewer line with specific permission from the local sewering agency.

DO . . . Check with your local sewering agency's policies and requirements concerning waste water disposal. **Water from many outdoor cleaning activities** may be acceptable for disposal to the sewer system. See the list on the back of this flyer for phone numbers of the sewering agencies in your area.

DO NOT . . . Pour **hazardous wastes** or toxic materials into the storm drain or sewer system . . . properly dispose of it instead. When in doubt, contact the local sewering agency! The agency will tell you what types of liquid wastes can be accepted.

DO . . . Understand that **water (without soap) used to remove dust from clean vehicles** may be discharged to a street or storm drain. **Washwater from sidewalk, plaza, and building surface cleaning** may go into a street or storm drain if ALL of the following conditions are met:

1) The surface being washed is free of residual oil stains, debris and similar pollutants by using dry cleanup methods (sweeping, and cleaning any oil or chemical spills with rags or other absorbent materials before using water).
2) Washing is done with water only - no soap or other cleaning materials.
3) You have not used the water to remove paint from surfaces during cleaning.

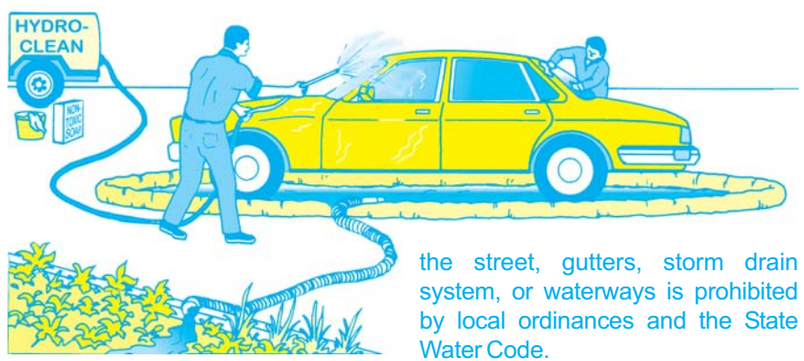
DO NOT . . . Dispose of water containing **soap or any other type of cleaning agent** into a storm drain or water body. This is a direct violation of state and/or local regulations. Because **wastewater from cleaning parking areas or roadways** normally contains metallic brake pad dust, oil and other automotive fluids, it should never be discharged to a street, gutter, or storm drain.

DO . . . Understand that **mobile auto detailers** should divert washwater to landscaped or dirt areas. Note: Be aware that soapy washwater may adversely affect landscaping; consult with the property owner. Residual washwater may remain on paved surfaces to evaporate; sweep up any remaining residue. If there is sufficient water volume to reach the storm drain, collect the runoff and obtain permission to pump it into the sanitary sewer. Follow local sewering agency's requirements for disposal.

DO NOT . . . Dispose of left over cleaning agents into the gutter, storm drain or sanitary sewer.

Regarding Cleaning Agents:

If you must use soap, use biodegradable/phosphate free cleaners. Avoid use of petroleum based cleaning products. Although the use of nontoxic cleaning products is strongly encouraged, ***do*** understand that these products can still degrade water quality and, therefore, the discharge of these products into



the street, gutters, storm drain system, or waterways is prohibited by local ordinances and the State Water Code.

Note: When cleaning surfaces with a high pressure washer or steam cleaning methods, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning, as compared to the use of a low pressure hose, can remove additional materials that can contaminate local waterways.

Other Tips to Help Protect Our Water . . .

Screening Wash Water

A thorough dry cleanup before washing (without soap) surfaces such as building exteriors and decks without loose paint, sidewalks, or plaza areas, *should be sufficient to protect storm drains.* **However**, if any debris (solids) could enter storm drains or remain in the gutter or street after cleaning, washwater should first pass through a "20 mesh" or finer screen to catch the solid material, which should then be disposed of in the trash.

Drain Inlet Protection/ Containing & Collecting Wash Water

- Sand bags can be used to create a barrier around storm drain inlets.
- Plugs or rubber mats can be used to temporarily seal storm drain openings.
- You can also use vacuum booms, containment pads, or temporary berms to keep wash water away from the street, gutter, or storm drain.

Equipment and Supplies

Special materials such as absorbents, storm drain plugs and seals, small sump pumps, and vacuum booms are available from many vendors. For more information check catalogs such as New Pig (800-468-4647), Lab Safety Supply (800-356-0783), C&H (800-558-9966), and W.W. Grainger (800-994-9174); or call the Cleaning Equipment Trade Association (800-441-0111) or the Power Washers of North America (800-393-PWNA).

For Information:

For more information on the General Industrial Storm Water Permit contact:

State Water Resources Control Board (SWRCB)
(916) 657-1146 or www.swrcb.ca.gov/ or, at your Regional Water Quality Control Board (RWQCB).

Santa Ana Region (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
(909) 782-4130

San Diego Region (9)
9771 Clairemont Mesa Blvd., Ste. A
San Diego, CA 92124
(619) 467-2952

Colorado River Basin Region (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
HAZARDOUS WASTE DISPOSAL: (909) 358-5055
RECYCLING INFORMATION: 1-800-366-SAVE
TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call:
(909) 955-1111.

StormWater
CleanWater
PROTECTION PROGRAM

Riverside County gratefully acknowledges the State Water Quality Control Board and the American Public Works Association, Storm Water Quality Task Force for the information provided in this brochure.

DID YOU KNOW . . .

YOUR FACILITY MAY NEED A STORM WATER PERMIT?

Many industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit

FIND OUT IF YOUR FACILITY MUST OBTAIN A PERMIT

StormWater Pollution . . . What you should know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

In recent years, awareness of the need to protect water quality has increased. As a result, federal, state, and local programs have been established to reduce polluted stormwater discharges to our waterways. The emphasis of these programs is to prevent stormwater pollution since it's much easier, and less costly, than cleaning up "after the fact."

National Pollutant Discharge Elimination System (NPDES)

In 1987, the Federal Clean Water Act was amended to establish a framework for regulating industrial stormwater discharges under the NPDES permit program. In California, NPDES permits are issued by the State Water Resources Control Board (SWRCB) and the nine (9) Regional Water Quality Control Boards (RWQCB). In general, certain industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit if the type of facilities or operations falls into one of the several categories described in this brochure.

How Do I Know If I Need A Permit?

Following are ***general descriptions*** of the industry categories types that are regulated by the Industrial Activities Storm Water General Permit. Contact your local Region Water Quality Control Board to determine if your facility/operation requires coverage under the Permit.

➜ Facilities such as cement manufacturing; feedlots; fertilizer manufacturing; petroleum refining; phosphate manufacturing; steam electric power generation; coal mining; mineral mining and processing; ore mining and dressing; and asphalt emulsion;

➜ Facilities classified as lumber and wood products (except wood kitchen cabinets); pulp, paper, and paperboard mills; chemical producers (except some pharmaceutical and biological products); petroleum and coal products; leather production and products; stone, clay and glass products; primary metal industries; fabricated structural metal; ship and boat building and repairing;

➜ Active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations;

➜ Hazardous waste treatment, storage, or disposal facilities;

➜ Landfills, land application sites and open dumps that receive or have received any industrial waste; unless there is a new overlying land use such as a golf course, park, etc., and there is no discharge associated with the landfill;

➜ Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards;

➜ Steam electric power generating facilities, facilities that generate steam for electric power by combustion;

➜ Transportation facilities that have vehicle maintenance shops, fueling facilities, equipment cleaning operations, or airport deicing operations. This includes school bus maintenance facilities operated by a school district;

➜ Sewage treatment facilities;

➜ Facilities that have areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water.

How do I obtain coverage under the Industrial Activities Storm Water General Permit?

Obtain a permit application package from your local Regional Water Quality Control Board listed on the back of this brochure or the State Water Resources Control Board (SWRCB). Submit a completed Notice of Intent (NOI) form, site map and the appropriate fee ($250 or $500) to the SWRCB. Facilities must submit an NOI thirty (30) days prior to beginning operation. Once you submit the NOI, the State Board will send you a letter acknowledging receipt of your NOI and will assign your facility a waste discharge identification number (WDID No.). You will also receive an annual fee billing. These billings should roughly coincide with the date the State Board processed your original NOI submittal.

What are the requirements of the Industrial Activities Storm Water General Permit?

The basic requirements of the Permit are:

1. The facility must eliminate any non-stormwater discharges or obtain a separate permit for such discharges.

2. The facility must develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must identify sources of pollutants that may be exposed to stormwater. Once the sources of pollutants have been identified, the facility operator must develop and implement Best Management Practices (BMPs) to minimize or prevent polluted runoff.

   Guidance in preparing a SWPPP is available from a document prepared by the California Storm Water Quality Task Force called the California Storm Water Best Management Practice Handbook.

3. The facility must develop and implement a Monitoring Program that includes conducting visual observations and collecting samples of the facility's storm water discharges associated with industrial activity. The General Permit requires that the analysis be conducted by a laboratory that is certified by the State of California.

4. The facility must submit to the Regional Board, every July 1, an annual report that includes the results of its monitoring program.

A Non-Storm Water Discharge is... *any discharge to a storm drain system that is not composed entirely of storm water. The following non-storm water discharges are authorized by the General Permit: fire hydrant flushing; potable water sources, including potable water related to the operation, maintenance, or testing of potable water systems; drinking fountain water; atmospheric condensates including refrigeration, air conditioning, and compressor condensate; irrigation drainage; landscape watering; springs; non-contaminated ground water; foundation or footing drainage; and sea water infiltration where the sea waters are discharged back into the sea water source.*

A BMP is . . . *a technique, process, activity, or structure used to reduce the pollutant content of a storm water discharge. BMPs may include simple, non-structural methods such as good housekeeping, staff training and preventive maintenance. Additionally, BMPs may include structural modifications such as the installation of berms, canopies or treatment control (e.g. setting basins, oil/water separators, etc.)*

WARNING*: There are significant penalties for non-compliance: a minimum fine of $5,000 for failing to obtain permit coverage, and, up to $10,000 per day, per violation plus $10 per gallon of discharge in excess of 1,000 gallons.*

After the Storm

A Citizen's Guide to Understanding Stormwater

EPA 833-B-03-002

January 2003

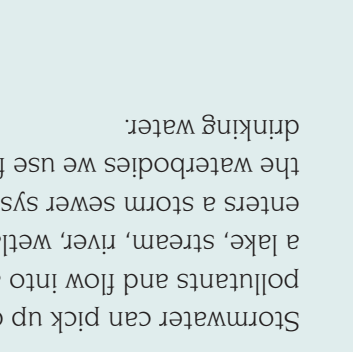
For more information contact:

or visit
www.epa.gov/npdes/stormwater
www.epa.gov/nps

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

What is stormwater runoff?

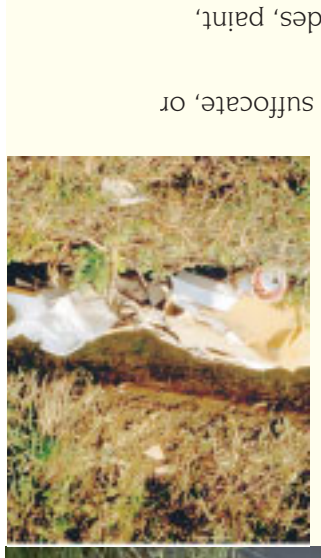


Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.
- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

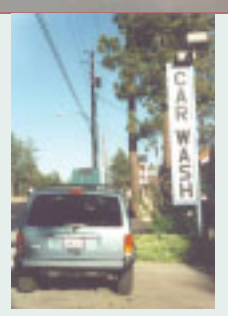
- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

Auto care



Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

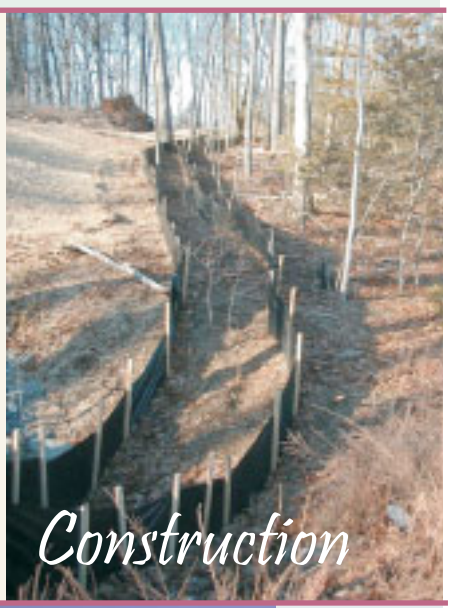
Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

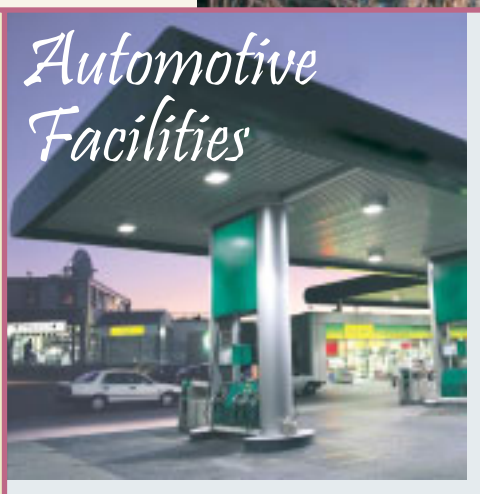
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.



Automotive Facilities

Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

For Information:

For more information on the General Industrial Storm Water Permit contact:

State Water Resources Control Board (SWRCB)
(916) 657-1146 or www.swrcb.ca.gov/ or, at your Regional Water Quality Control Board (RWQCB).

Santa Ana Region (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
(909) 782-4130

San Diego Region (9)
9771 Clairemont Mesa Blvd., Ste. A
San Diego, CA 92124
(619) 467-2952

Colorado River Basin Region (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491

SPILL RESPONSE AGENCY:
HAZ-MAT: (909) 358-5055
HAZARDOUS WASTE DISPOSAL: (909) 358-5055
RECYCLING INFORMATION: 1-800-366-SAVE
TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN: 1-800-506-2555

To order additional brochures or to obtain information on other pollution prevention activities, call:
(909) 955-1111.

StormWater
CleanWater
PROTECTION PROGRAM

Riverside County gratefully acknowledges the State Water Quality Control Board and the American Public Works Association, Storm Water Quality Task Force for the information provided in this brochure.

DID YOU KNOW . . .

YOUR FACILITY MAY NEED A STORM WATER PERMIT?

Many industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit

FIND OUT IF YOUR FACILITY MUST OBTAIN A PERMIT

StormWater Pollution . . . What you should know

Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to help prevent flooding by carrying excess rainwater away from streets. Since the storm drain system does not provide for water treatment, it also serves the *unintended* function of transporting pollutants directly to our waterways.

Unlike sanitary sewers, storm drains are not connected to a treatment plant - they flow directly to our local streams, rivers and lakes.

In recent years, awareness of the need to protect water quality has increased. As a result, federal, state, and local programs have been established to reduce polluted stormwater discharges to our waterways. The emphasis of these programs is to prevent stormwater pollution since it's much easier, and less costly, than cleaning up "after the fact."

National Pollutant Discharge Elimination System (NPDES)

In 1987, the Federal Clean Water Act was amended to establish a framework for regulating industrial stormwater discharges under the NPDES permit program. In California, NPDES permits are issued by the State Water Resources Control Board (SWRCB) and the nine (9) Regional Water Quality Control Boards (RWQCB). In general, certain industrial facilities and manufacturing operations must obtain coverage under the Industrial Activities Storm Water General Permit if the type of facilities or operations falls into one of the several categories described in this brochure.

How Do I Know If I Need A Permit?

Following are ***general descriptions*** of the industry categories types that are regulated by the Industrial Activities Storm Water General Permit. Contact your local Region Water Quality Control Board to determine if your facility/operation requires coverage under the Permit.

➜ Facilities such as cement manufacturing; feedlots; fertilizer manufacturing; petroleum refining; phosphate manufacturing; steam electric power generation; coal mining; mineral mining and processing; ore mining and dressing; and asphalt emulsion;

➜ Facilities classified as lumber and wood products (except wood kitchen cabinets); pulp, paper, and paperboard mills; chemical producers (except some pharmaceutical and biological products); petroleum and coal products; leather production and products; stone, clay and glass products; primary metal industries; fabricated structural metal; ship and boat building and repairing;

➜ Active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations;

➜ Hazardous waste treatment, storage, or disposal facilities;

➜ Landfills, land application sites and open dumps that receive or have received any industrial waste; unless there is a new overlying land use such as a golf course, park, etc., and there is no discharge associated with the landfill;

➜ Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards;

➜ Steam electric power generating facilities, facilities that generate steam for electric power by combustion;

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Stormwater Pollution Found in Your Area!

This is not a citation.

This is to inform you that our staff found the following pollutants in the storm sewer system in your area. This storm sewer system leads directly to

_____ .

- ❑ Motor oil
- ❑ Oil filters
- ❑ Antifreeze/ transmission fluid
- ❑ Paint
- ❑ Solvent/degreaser
- ❑ Cooking grease
- ❑ Detergent
- ❑ Home improvement waste (concrete, mortar)
- ❑ Pet waste
- ❑ Yard waste (leaves, grass, mulch)
- ❑ Excessive dirt and gravel
- ❑ Trash
- ❑ Construction debris
- ❑ Pesticides and fertilizers
- ❑ Other

_____

For more information or to report an illegal discharge of pollutants, please call:

WHEN IT RAINS IT DRAINS

www.epa.gov/npdes/stormwater

EPA
United States Environmental Protection Agency

EPA 833-F-03-002
April 2003

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Anything that enters a storm sewer system is discharged *untreated* into the waterbodies we use for swimming, fishing, and providing drinking water.

Remember: Only Rain Down the Drain

To keep the stormwater leaving your home or workplace clean, follow these simple guidelines:

- Use pesticides and fertilizers sparingly.
- Repair auto leaks.
- Dispose of household hazardous waste, used auto fluids (antifreeze, oil, etc.), and batteries at designated collection or recycling locations.
- Clean up after your pet.
- Use a commercial car wash or wash your car on a lawn or other unpaved surface.
- Sweep up yard debris rather than hosing down areas. Compost or recycle yard waste when possible.
- Clean paint brushes in a sink, not outdoors. Properly dispose of excess paints through a household hazardous waste collection program.
- Sweep up and properly dispose of construction debris like concrete and mortar.

EPA

Clean Water State Revolving Fund

ACTIVITY *UPDATE*

Innovative use of Clean Water State Revolving Funds for Nonpoint Source Pollution

States are successfully using linked deposit and pass-through loans to fund important nonpoint source pollution remediation projects

Many states are successfully using the USEPA's Office of Water, Clean Water State Revolving Fund (CWSRF) loan program to fund important nonpoint source pollution remediation projects. Nonpoint source pollution is widely viewed as one of the most serious threats to our nation's water quality. State and local governments, local watershed and agricultural organizations, and many others are working to devise solutions that address nonpoint source pollution. The CWSRF program provides very attractive low-interest loans that spread project costs over a repayment period of up to 20 years. Today, CWSRF programs are funding projects that address agriculture runoff, leaking on-site septic systems, and urban nonpoint source pollution, including stormwater runoff and brownfield contamination.

During the initial operating phase of CWSRF programs, states designed loan options and implemented administrative procedures that would best serve municipal wastewater system projects. However, when considering how the CWSRF program could be used to address nonpoint source pollution, a number of states recognized that they would need to go beyond the typical municipal borrower and provide loan assistance to farmers, homeowners, and nonprofit organizations. States also recognized that providing loans to small private borrowers could be challenging. The loans would fund a variety of small projects, there would be more of them to service and manage, and there would be a greater risk of loan defaults.

States have taken different approaches to addressing these challenges. In some states, the CWSRF program has called upon internal expertise and the expertise of other state personnel to help manage loans to private borrowers. Other states have used creative lending approaches that pass loan risks and loan servicing responsibilities to financial institutions, local governments, or other state agencies. These lending methods include linked deposit loan programs with local financial institutions and pass-through loan programs with local government or state agencies. This activity update will highlight these loan structures with three case studies of successful state programs.

What is a linked deposit loan?

Under a linked deposit loan approach, a state works with local private lending institutions to provide assistance for nonpoint source pollution control. The state agrees to accept a reduced rate of return on an investment (e.g., a certificate of deposit) and the lending institution agrees to provide a loan to a borrower at a similarly reduced interest rate. For example, if the typical earnings rate for a certificate of deposit (CD) is five percent, a state might agree to purchase a CD that earns two percent interest, and in exchange, the lending institution agrees to provide a loan to a borrower at an interest rate that is three percentage points lower than the market rate for the borrower. In this program, the CWSRF investment (deposit) is linked to a low-interest loan, thereby earning the description "linked deposit loan."

Linked deposit loan programs provide benefits for CWSRF programs, local financial institutions, and borrowers. The linked-deposit approach benefits CWSRF programs because they support high priority nonpoint source projects and because they place risk and management responsibilities with local financial institutions. Financial institutions earn profits from the linked deposit agreements and add an additional service for their customers. Borrowers find linked deposit programs to be economical and comfortable; they save money with low-interest loans, and they are comfortable working with local financial institutions.

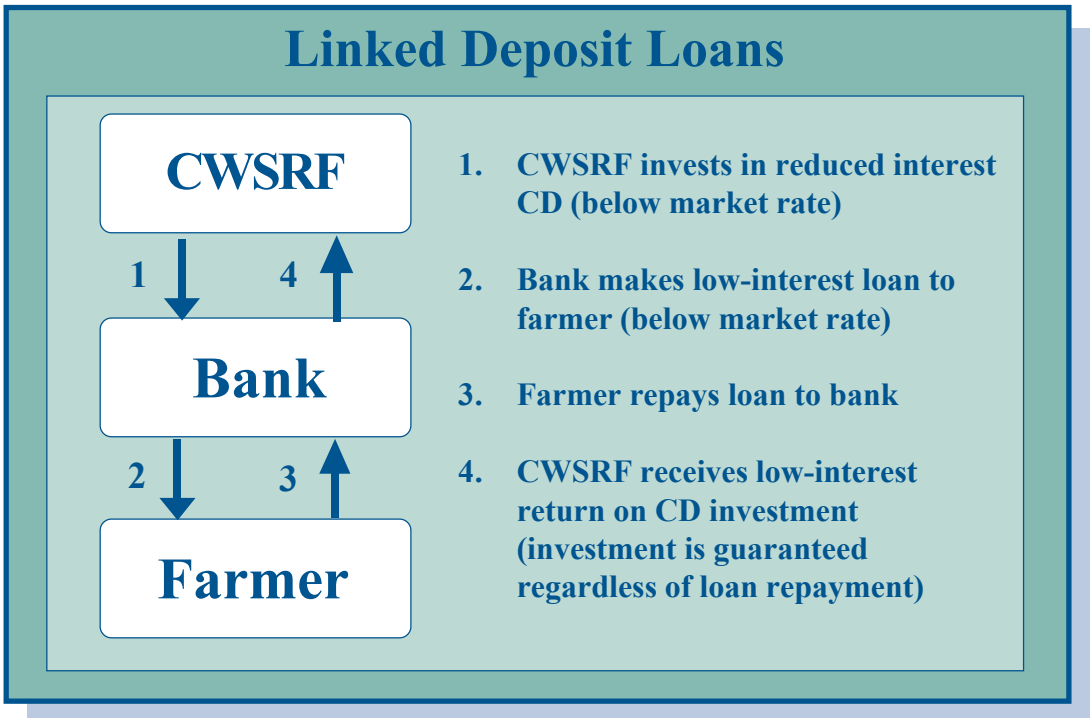


Figure 1. Linked deposit program flow chart

What is a pass-through loan?

In a pass-through loan, a CWSRF program makes a loan to another state or local government agency and that agency then lends the funds to private borrowers to address nonpoint source pollution. The town, county, or state agency reviews the project and the finances of each borrower. CWSRF loan funds are "passed-through" another government agency to private borrowers.

Pass-through loan programs benefit CWSRF programs, pass-through partners (towns, counties, and state agencies), and borrowers. These programs benefit CWSRF programs because they support high-priority nonpoint source projects and because they place risk and management responsibilities with program partners. Towns, counties, and state agencies benefit from pass-through programs because CWSRF funds support their nonpoint source priorities. Pass-through loans can offer two potential benefits to borrowers. First, pass-through loans are not provided by private lenders and, as a result, are likely to have lower interest rates. Second, local government agencies may have greater flexibility to provide loans to borrowers with relatively weak credit conditions if the borrower's nonpoint source project is a high priority for the state or local government agency.

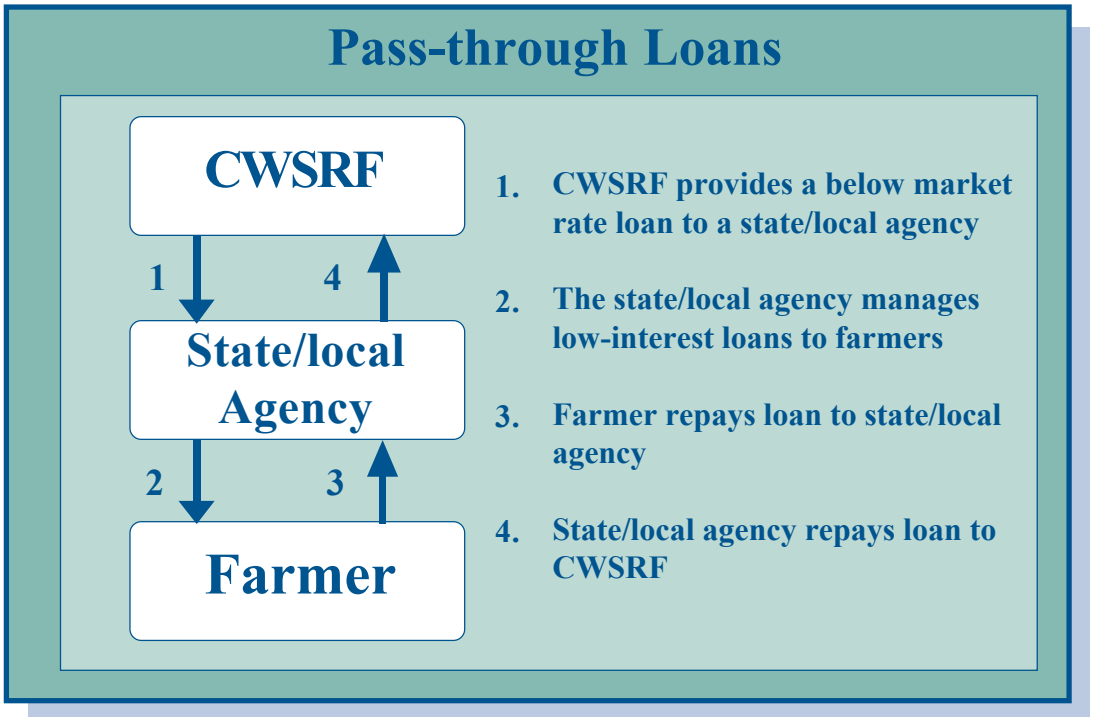


Figure 2. Pass-through program flow chart

Who has benefited from these programs and what have they funded?

CWSRF linked deposit and pass-through loan programs have supported borrowers implementing a variety of nonpoint source projects:

- Homeowners have implemented stormwater runoff best management practices and repaired or replaced failing on-site septic systems.
- Homeowner associations have addressed failing stormwater management facilities.
- Farmers have addressed agricultural runoff with a wide variety of agricultural best management practices including the construction of manure storage facilities, the restoration of filter strips and grassed waterways, and the use of conservation tillage equipment.

Ohio Case Study — Linked Deposit Loan Program

Ohio has used a linked-deposit loan program since 1993 to fund projects that support county watershed management plans. This program has funded more than 300 projects, including the repair of onsite wastewater treatment systems and the implementation of best management practices for agriculture, forestry, stormwater, and land development. The CWSRF program developed this program with the help of county soil and water conservation districts and local banks.

The CWSRF program implements its linked deposit loan program one county at a time. Each county's program is developed with two concurrent steps: the county soil and water conservation district develops a watershed management plan, and the CWSRF program and local financial institutions enter into agreements describing requirements and procedures for linked deposit loans.

Watershed management plans describe a watershed, identify sources of pollution, suggest actions that would address those pollution sources, prioritize water quality problems, identify sources of funding, and establish an implementation schedule. The county soil and water district's draft plan is reviewed by Ohio EPA and by a formal public review process. If Ohio EPA approves a plan after this review, the CWSRF program and the soil and water conservation district sign a memorandum of understanding that describes how these two entities will coordinate their implementation of the management plan.

At the same time that a watershed management plan is developed and reviewed, soil and conservation districts contact local banks to identify institutions that would like to participate in a linked deposit program. Interested banks enter into agreements with the CWSRF program that describe requirements and procedures for linked deposit loans.

Any borrower with a project that helps to implement a watershed management plan is eligible for a linked deposit loan. Participating banks review borrowers' credit using their own credit standards. If a bank approves a linked deposit loan, the CWSRF program purchases a CD of equal value from the bank. The CWSRF program accepts a CD interest rate that is five percentage points lower than the rate of a U.S. Treasury Note or Bond with the same term. The borrower's loan interest rate is also reduced by five percentage points. The bank makes semiannual payments of principal and interest to repay the CWSRF for its investment in the CD, and it makes these payments even if the borrower defaults on the linked deposit loan.

Massachusetts Case Study — Lending through Local Government

Since 1995, Massachusetts' Community Septic Management Program has used pass-through loans with local municipalities to fund the repair and replacement of failing septic systems. The program has funded more than 3,000 projects across the state. The CWSRF has developed this program with the cooperation of local municipalities.

Communities that participate in Massachusetts' Community Septic Management Program can borrow hundreds of thousands of dollars from the CWSRF program, but communities must first develop a septic management plan and procedures for a local betterment loan program (the community uses betterment assessments to secure the loans). Massachusetts provides grants of up to $20,000 to municipalities to support these planning activities and the administration of the program.

Massachusetts law defines a betterment assessment as a charge imposed on real property that receives a benefit from a public improvement. Municipalities have traditionally imposed betterments to pay for improvements such as roads, sidewalks and sewer lines. In the Community Septic Management Program, however, betterment agreements allow individuals to receive community support (a betterment loan) for septic system improvements, and the agreements allow communities to ensure that the loans are repaid as part of a property tax bill. The community can place a municipal lien on property if a homeowner defaults on a betterment loan.

Septic management plans identify and prioritize areas with septic systems that require monitoring, maintaining, and upgrading. As part of the planning process, communities develop maintenance schedules for septic systems, and they develop databases that track the inspection, maintenance, and upgrade of these systems. The Massachusetts Department of Environmental Protection reviews all community septic management plans.

Before a community can receive a CWSRF loan from the state, however, it also develops the framework for a local betterment loan program. Communities create administrative structures to manage the programs, devise a method for selecting priority projects, and work with their tax assessors to ensure that homeowners will repay their betterment loans as part of their local tax assessments.

Communities that develop septic management plans and procedures for a local betterment loan program receive loans from the CWSRF program for 20 years at zero percent interest. Communities typically borrow $200,000 from this program. Homeowners typically receive twenty-year loans from communities at two to five percent interest. Communities can use interest accrued on betterment loans to support the administrative costs of the loan programs. Communities must begin to repay the CWSRF within one year after they have finished dispersing the proceeds of each CWSRF loan.

Missouri Case Study — Lending through State Agencies

Missouri's Nonpoint Source Animal Waste Treatment Facility Loan Program is a pass-through loan program that uses a state agency as a loan intermediary. Since 1995, the Missouri Agriculture and Small Business Development Authority (MASBDA) has borrowed $5 million from the CWSRF program, and MASBDA has used these funds to support the construction of 88 animal waste treatment systems for livestock and poultry producers. The agricultural operation of each borrower in this loan program produces fewer than 1,000 animal units -- concentrated animal feeding operations are ineligible.

Missouri's Nonpoint Source Animal Waste Treatment Facility Loan Program does not require a regional planning effort similar to the soil and water conservation plans required in Ohio' linked deposit program or the septic management plans required in Massachusetts' pass-through loan program. Engineers with Missouri's CWSRF program review each project application to ensure that CWSRF-financed structures and equipment support the goals of the program.

Missouri's CWSRF program provides 10-year loans to MASBDA that have a 1.8 percent interest rate. Individual agricultural producers access these resources by submitting applications to MASBDA. MASBDA reviews the financial component of each application, assessing cash flows and establishing security requirements. Borrowers must provide a dedicated source of repayment and a first or second deed of trust on their property. Agricultural producers typically receive 10-year loans from MASBDA that have interest rates from 5.3-5.8 percent. However, MASBDA does not offer construction financing for animal waste treatment systems. Typically, agricultural producers use loans from the Nonpoint Source Animal Waste Treatment Facility Loan Program to pay off construction loans from a private lender. MASBDA uses the repayments from agricultural producers to repay its loan from the CWSRF.

Case Study Contact Information

More information on the programs outlined in this update can be found on the state program web sites or by contacting the programs themselves.

Ohio Environmental Protection Agency
Div. of Environmental & Financial Assistance
Contact: Bob Monsarrat
Phone: 614-644-3655
Web site:
www.epa.state.oh.us/defa/linkdepo.html

Massachusetts Department of Environmental Protection
Massachusetts' Community Septic Management Program
Contact: Joseph McNealy
Phone: 617-556-1068
Web site: www.state.ma.us/dep/brp

Missouri Department of Agriculture
Animal Waste Facility Loan Program
Contact: Steve Townley
Phone: 573-751-1397
Web site: www.mda.state.mo.us/a2c.htm

For more information about the Clean Water Revolving Fund, or for a program representative in your State, please contact:

Clean Water State Revolving Fund Branch

U.S. Environmental Protection Agency

1201 Constitution Avenue, NW (Mailcode 4204M)

Washington, DC 20004

Phone: (202) 564-0752 **Fax:** (202) 501-2403

Internet: http://www.epa.gov/owm

Clean Water
State Revolving Fund

Clean Water

Everybody's Business

10 Things You Can Do to Prevent Stormwater Runoff Pollution

- Use fertilizers sparingly and sweep up driveways, sidewalks, and roads
- Never dump anything down storm drains
- Vegetate bare spots in your yard
- Compost your yard waste
- Avoid pesticides; learn about Integrated Pest Management (IPM)
- Direct downspouts away from paved surfaces
- Take your car to the car wash instead of washing it in the driveway
- Check car for leaks, and recycle motor oil
- Pick up after your pet
- Have your septic tank pumped and system inspected regularly

EPA United States Environmental Protection Agency

For more information, visit
www.epa.gov/nps or
www.epa.gov/npdes/stormwater

EPA
United States
Environmental Protection
Agency

EPA 841-F-03-003

Protecting Water Quality *from* URBAN RUNOFF

Clean Water Is Everybody's Business

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and groundwater resources, development should be designed and built to minimize increases in runoff.

The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

How Urbanized Areas Affect Water Quality

Increased Runoff

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most of the rainfall and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts.

Storm sewer systems concentrate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drains and empties into a stream, its excessive volume and power blast out streambanks, damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded streambanks. They often carry higher water temperatures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life.

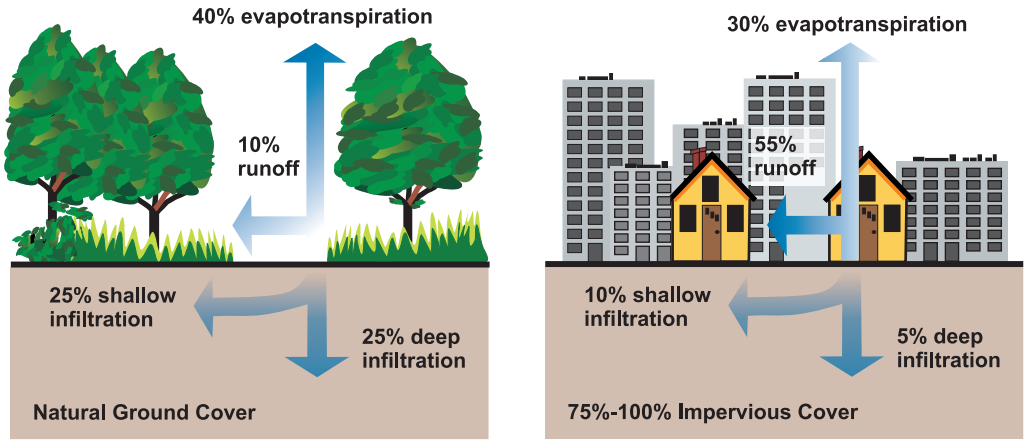
The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

- Sediment
- Oil, grease, and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface ruunoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

Managing Urban Runoff

What Homeowners Can Do

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management (IPM) to reduce dependence on harmful pesticides.

In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.

Controlling Impacts from New Development

Developers and city planners should attempt to control the volume of runoff from new development by using low impact development, structural controls, and pollution prevention strategies. Low impact development includes measures that conserve natural areas (particularly sensitive hydrologic areas like riparian buffers and infiltrable soils); reduce development impacts; and reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths.

Controlling Impacts from Existing Development

Controlling runoff from existing urban areas is often more costly than controlling runoff from new developments. Economic efficiencies are often realized through approaches that target "hot spots" of runoff pollution or have multiple benefits, such as high-efficiency street sweeping (which addresses aesthetics, road safety, and water quality). Urban planners and others responsible for managing urban and suburban areas can first identify and implement pollution prevention strategies and examine source control opportunities. They should seek out priority pollutant reduction opportunities, then protect natural areas that help control runoff, and finally begin ecological restoration and retrofit activities to clean up degraded water bodies. Local governments are encouraged to take lead roles in public education efforts through public signage, storm drain marking, pollution prevention outreach campaigns, and partnerships with citizen groups and businesses. Citizens can help prioritize the clean-up strategies, volunteer to become involved in restoration efforts, and mark storm drains with approved "don't dump" messages.

Related Publications

Turn Your Home into a Stormwater Pollution Solution!

www.epa.gov/nps

This web site links to an EPA homeowner's guide to healthy habits for clean water that provides tips for better vehicle and garage care, lawn and garden techniques, home improvement, pet care, and more.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas

www.epa.gov/owow/nps/urbanmm

This technical guidance and reference document is useful to local, state, and tribal managers in implementing management programs for polluted runoff. Contains information on the best available, economically achievable means of reducing pollution of surface waters and groundwater from urban areas.

Onsite Wastewater Treatment System Resources

www.epa.gov/owm/onsite

This web site contains the latest brochures and other resources from EPA for managing onsite wastewater treatment systems (OWTS) such as conventional septic systems and alternative decentralized systems. These resources provide basic information to help individual homeowners, as well as detailed, up-to-date technical guidance of interest to local and state health departments.

Low Impact Development Center

www.lowimpactdevelopment.org

This center provides information on protecting the environment and water resources through integrated site design techniques that are intended to replicate preexisting hydrologic site conditions.

Stormwater Manager's Resource Center (SMRC)

www.stormwatercenter.net

Created and maintained by the Center for Watershed Protection, this resource center is designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues.

Strategies: Community Responses to Runoff Pollution

www.nrdc.org/water/pollution/storm/stoinx.asp

The Natural Resources Defense Council developed this interactive web document to explore some of the most effective strategies that communities are using around the nation to control urban runoff pollution. The document is also available in print form and as an interactive CD-ROM.

For More Information

U.S. Environmental Protection Agency
Nonpoint Source Control Branch (4503T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

www.epa.gov/nps

February 2003

Stormwater Management

A Guide for Auto Recycler Owners and Operators

Only Rain in the Drain

Stormwater Protection
Starts With You

The facility operator's attitude toward stormwater management can make all the difference. It's your responsibility to communicate to your employees that stormwater management is a priority. Make sure your employees understand why stormwater management is important, both to your business and to the environment. Start by having them review the enclosed video and fact sheet.

Protecting stormwater can benefit your business in several important ways:

- **Professionalism and pride in your business** – Both workers and customers appreciate a clean and responsible facility.
- **It's the law** – Not complying with stormwater rules can put your business in jeopardy. Regulators and environmental groups across the country are increasingly targeting auto dismantlers for stormwater violations.
- **Environmental protection** – We all want clean streams, rivers, lakes, bays, and oceans for our families and for our future. Your business can protect the environment by following some straightforward and commonsense practices.

Protect the environment to protect your business

The following practices describe options that your facility can implement to help address its stormwater issues. Although following all of the practices described below may help improve performance with regard to stormwater management, it does not guarantee that your facility will be in compliance with all applicable stormwater rules. Check with your state regulatory agency or EPA for more information.

The Stormwater Permit

All vehicle dismantling facilities in the United States (except those in a combined sewer service area or facilities that do not discharge stormwater from their property) are required by the Clean Water Act to obtain a stormwater permit either from the U.S. Environmental Protection Agency or from an appropriate state agency. You must first file a Notice of Intent (NOI) with the appropriate state agency. You must also prepare a Storm Water Pollution Prevention Plan (SWPPP) to describe how you will address your facility's stormwater issues.

The practices below are organized by facility area or activity. Links and contact information to obtain additional information about stormwater and other environmental issues related to auto dismantling are listed at the end of this document.

What are Best Management Practices (BMPs)?

The term "BMP" is used to describe management practices that many different industries use to address a range of environmental issues. We'll use BMP to describe the practices that you can implement to address your auto dismantling facility's stormwater issues.

› Training

Employee training is critical! Train appropriate employees on relevant stormwater management procedures, especially during the wet season and prior to rain or snow events. All employees must be trained upon their initial hire and at least once per year thereafter. Be sure to document employee training. Also, place signs around activity areas as reminders to your workers; for example, "No fluids in the drain" or "Sweep up loose absorbent daily." Make up your own signs that make sense for your operation.

› Incoming Vehicles

Inspect all incoming vehicles for leaking fluids and unwanted materials as they enter your facility. Promptly contain leaks with drip pans or absorbent materials.

› Fluid Removal

Establish a procedure for processing vehicles and stick to it. First, before any vehicle is placed in the yard for long-term storage or crushed, and before fluid-containing parts are dismantled, drain the following fluids from the vehicle in the order that best fits your operation:

- Fuel
- Motor oil
- Transmission fluid
- Brake fluid
- Antifreeze
- Freon

Draining these fluids before placing the vehicle in the yard reduces 1) the possibility of spills when parts are removed later, and 2) time and cost to your business of cleaning up leaks and spills.

› Fluid Draining and Vehicle Dismantling Area

Ideally, these activities should be conducted in the same area, which should be covered with a roof. Your fluid draining and vehicle dismantling areas have more potential to contaminate stormwater than any other areas of your facility. Properly covering this area can eliminate contact with rainfall and is a great way to get a big bang for your buck in preventing stormwater pollution. Rain or snow can carry harmful materials like oil or gasoline into the soil and nearby streams, rivers, and lakes. Roofs not only keep out rain and snow, but also make the work area more comfortable for your workers.

If you don't currently dismantle fluid-containing parts and drain fluids under cover, you don't necessarily have to put up an entirely new and expensive building. One low-cost roofing option available is the "VersaTube" offered by Tuff Shed. (See http://www.tuffshed.com/versatube.htm or call (800) BUY-TUFF for more information.)

Another option includes building your own temporary cover using low-cost materials. Plans and materials for such temporary roofs can be obtained from vendors like South Bay Canopy (408) 998-8280.

You should also have a concrete pad in the draining and dismantling area, and you should drain all vehicles on this surface. Draining over concrete makes spills and leaks easier to clean up and minimizes the chance of environmental harm. Use appropriate fluid removal and handling equipment, such as suction systems, drain racks, and funnels for the containers.

Prevent stormwater pollution by minimizing the exposure of dismantling and fluid removal activities to stormwater. In addition to overhead cover, possible options include installing intercept trenches, berming the perimeter of the area, or using channels, swales, or grade breaks to divert the flow of stormwater around these areas.

› Fluid Storage

Storing fluids properly helps cut down on the amount of contaminants that end up in stormwater. When you remove fluids, transfer them to the proper container. Confine fluid storage to designated areas that are covered and have adequate secondary containment. Keep drums containing fluids away from storm drains; consider storing fluids near the location where fluids are drained. Maintain good integrity of all storage containers. Do not leave open drain pans that contain fluids around the shop.

You are responsible for ensuring that your fluids are handled by an authorized processor, transporter, and treatment/disposal facility.

› Spill Cleanup

Clean up spills promptly and thoroughly. Keep appropriately sized and stocked "spill kits" available in the areas where you conduct the following activities:

- Dismantling and fluid removal
- Fluid storage
- Battery and parts storage
- Fueling
- Equipment maintenance

For smaller spills, use shop rags and oil dry. Used absorbents should be placed in a designated container for proper disposal.

What should be in your spill kit?

- Absorbent socks or booms
- Absorbent pillows and pads
- Oil dry
- Broom and shovel
- Disposal bags or other containers
- Safety goggles
- Plastic gloves

- **Never use vehicle fluids for dust control!**
- **Don't mix your used oil with solvents, brake cleaner, or antifreeze.**
  This creates a hazardous waste, which can't be recycled and is very expensive to get rid of.
- **Don't pour fluids into your septic system, sanitary sewer, dry well, on the ground, or in the trash.**

› Parts Storage

Store engines, transmissions, and other oily parts (resale, core, or scrap) in a way that avoids exposure to rain or snowfall. This can include:

1) Storing parts indoors
2) Storing parts under a permanent roof on impervious surface
3) Storing parts in weather-proof, leak-proof, covered containers
4) Placing parts in vehicle bodies
5) Providing temporary cover (like tarps) for these parts as an interim measure

Lead acid battery components are toxic and corrosive and can contaminate the soil and water if handled improperly. Store batteries inside a building or outside in covered, non-leaking containers. Separate batteries from other wastes like paper, rags, garbage and flammable or hazardous chemicals. Monitor your battery storage area for leaks or deterioration, and take quick action to address any spills or leaks. Lime can be used to neutralize spilled battery acid. *Never pour battery acid on the ground or into a storm drain!*

Radiators removed from vehicles should be stored under a roof, tarp, or other cover, and raised up off the ground such that there is no contact with rainfall and surface drainage.

› Crushing

Never crush a vehicle without draining all the fluids and removing gas tanks, tires, and batteries. Capture and properly dispose of residual fluids released during crushing. You're responsible for ensuring fluids are captured and don't run off your property, even if you use a contractor to crush your vehicles.

› Vehicle Storage

If engines or fluid-containing parts remain in the vehicle when it is placed in the yard, place a hood or other cover, such as a well-secured tarp, over the vehicle engine. Use drip pans under stored vehicles with leaks.

Don't place vehicles on the ground where there is a heavy stormwater flow or close to a storm drain.

After vehicles are moved, scrape up dirt or gravel that was stained from leaks and drips. Manage the contaminated material in accordance with applicable regulations.

- Never wash spills into storm drains!
- Sweep up absorbent material and properly dispose at least daily.

› Equipment Maintenance

Schedule and perform periodic inspections of equipment. Regular maintenance of equipment such as forklifts reduces risk of breakdown and fluid release. Check for leaks and spills and for malfunctioning, worn, or corroded parts. Equipment maintenance should be done indoors or, where practical, on an impervious surface. If maintenance can't be done under cover, take adequate spill control and/or cleanup measures.

› Fueling

Pave refueling areas with concrete to prevent contamination of the soil and to enable cleanup. Don't leave vehicles unattended while fueling.

› Housekeeping

Sweep and clean paved surfaces daily to reduce sediment and contaminant buildup. Routine housekeeping is important. Catchments, inlets, oil-water separators, oil booms, waddles, tarps, and other pollutant-collecting materials need to be maintained regularly or they can become ineffective. Clean out drain inlets periodically, especially before the wet season, during the wet season, and after the wet season ends.

› Erosion Control

Tackle TSS! You may have heard of TSS or total suspended solids – in other words, dirt. Controlling the amount of dirt that runs off your property is important because metals and other harmful pollutants can attach themselves to the dirt particles and end up flowing off the property with stormwater. Eroded soil can also smother aquatic life.

Implement appropriate vegetative, structural, or stabilization measures such as basins, sediment traps, geotextiles, buffer strips, or filter berms in areas without much vegetation where soil erosion is evident.

› Non-Stormwater Discharges

Wash water from equipment, work areas, or shop floors cannot come into contact or mix with rainfall or surface drainage, or drain offsite. Vehicle and hand wash water is OK to be discharged to the sanitary sewer where allowed (be sure to check with your local sanitary sewer district). Most states prohibit all non-stormwater discharges from your property, including, but not limited to, discharges of wash water, rinse water and spilled fluids. If you are permitted to use sewers, make sure your drain is connected to the sanitary sewer. If this is not possible in your area, the wash water must be managed on-site. Management options include recycling, re-use, or off-site disposal. If you let the water soak into the ground (infiltration), take appropriate steps to prevent groundwater contamination and infestation by mosquitoes or other pests. For additional information consult your local regulatory agency.

- Residues from dried wash water cannot come into contact with rainfall or surface drainage.

- **Know where your drains go. Plug any floor drains that would let a spill run into septic systems or storm drains.**
  Automotive fluids and solvents can contaminate drinking water if they end up in drains that discharge to soil.

- Following washing, collect and clean up any accumulated sediments, oil deposits, debris, and paint particles.
- Do not steam clean or pressure wash parts without proper wash water management.
- Do not hose down the shop floor if water will run into a storm drain or off the property.

› Stormwater Filter Systems

Inexpensive filter systems or absorbents can provide an extra level of defense against stormwater pollution. Examples include: absorbent socks or booms, silt fences, straw bales, rock filters, and inlet filters. Regular maintenance of these products is essential – if they're not maintained, they won't work. Further, these measures are not a substitute for good stormwater management practices.

› Inspection

Inspect your site regularly to ensure all appropriate BMPs are being implemented. Increase inspections during periods of rainy weather. Based on permit or management needs, maintain a record of visual inspections.

Inspect oil containers, fresh water systems, irrigation lines, fueling areas, and other piping systems for leaks. If evidence of leaks is found, promptly repair or replace damaged parts to prevent polluted runoff and non-stormwater discharges.

› Customer Education

Inform customers who remove parts to do so properly and to appropriately dispose of fluids. For example, make fluid receptacles readily available, post signs that require the use of drip pans for parts removal, and prohibit waste generating activities like vehicle maintenance in parking lots.

Mercury Switches

Mercury switches are an important issue. Many older vehicles contain mercury, which is highly toxic and can cause learning disabilities and mental retardation in newborn children. When vehicles are crushed and mercury remains inside, it can get onto the ground and into waterways. Also, mercury can be released into the air and water bodies after scrapped vehicles go to the shredder.

What to do about mercury

Mercury switches are commonly found under vehicle hoods and trunks and less frequently in automatic braking systems (ABS). These switches can easily be removed to prevent contamination of the environment and human health problems.

Information on removing mercury from vehicles is available online at:

epa.gov/glnpo/bnsdocs/hgsbook/auto.pdf

epa.gov/region5/air/mercury/autoswitch.htm

switchout.ca

Some states require mercury switches to be removed before vehicles are crushed. Some auto dismantlers remove the switches even if they are not required to do so. If you choose to address this important environmental issue and remove mercury switches before your vehicles are crushed, store the switches in a leak-proof, clearly marked, closed container. Also take care to ensure that the switches do not break during handling or storage. A licensed metals recycler that reclaims mercury can dispose of the switches. Contact your state environmental agency for more information.

You
>> CAN <<
Make a Difference!

Auto recyclers do their part to conserve natural resources by recycling valuable materials. Build on this good work and protect the environment from polluted runoff by implementing the BMPs described in this fact sheet. Make sure that your employees understand that stormwater management is important and are trained to implement your BMPs.

Remember,
stormwater protection
starts with YOU!

"It's critical for owners to set an example and be actively involved in implementing BMPs." – Brian Werth, Select Auto & Truck Recyclers

Where to find more information

Check out the following sources for additional information on BMPs for auto recyclers:

Manuals

- An Environmental Compliance Workbook for Automotive Recyclers, Florida DEP
  www.dep.state.fl.us/central/home/ps/asyca/fl_gyb.pdf
- Environmental Compliance Guide for Motor Vehicle Salvage Yards, OH Small Bus. Assistance Office
  www.epa.state.oh.us/other/sbao/salvageguide.pdf
- Vehicle Recycling Manual: A Guide for Vehicle Recyclers, Washington State Department of Ecology
  www.ecy.wa.gov/pubs/97433.pdf
- Automotive Recyclers Guide to a Cleaner Environment, New York DEC
  www.dec.state.ny.us/website/reg8/press/autorec/autorec0.pdf
- Certified Auto Recycler (CAR) Guidance Manual, Automotive Recyclers Association
  www.autorecyc.org (Available to members only)

Other Sources

- The National Compliance Assistance Clearinghouse is your guide to compliance information on the Internet. It provides quick access to compliance tools and contacts from EPA and other compliance assistance providers. The clearinghouse has an entire section devoted to the auto salvage industry.
  cfpub.epa.gov/clearinghouse
- A list of state and local environmental contacts can be found on the internet at:
  www.epa.gov/epapages/statelocal/envrolst.htm
- The EPA Small Business Ombudsman can help you understand environmental regulations, or refer you to local contacts. Their toll-free small business hotline provides regulatory and technical assistance information: (800) 368-5888

Vendors

Call for catalogs or more information

Low-Cost Roofs:		**Fluid Removal and Storage Equipment**:		**Spill Kits and Absorbent Materials**:	
Tuff Shed	(800) BUY-TUFF	Hy-Tec Environmental	(800) 336-4499	Stormtech	(888) 549-5374
South Bay Canopy	(408) 998-8280	Spill Cleanup Direct	(800) 356-0783	New Pig	(800) 468-4647

Note: Sustainable Conservation and U.S. EPA do not endorse any of these products.
This list is not complete: other vendors may provide similar or identical products and services.

Developed by

Sustainable Conservation
www.suscon.org

Supervisión de la Precipitación Pluvial

Una Guía para los Dueños y Operadores de Recicladoras de Autos

La Protección de la Precipitación Pluvial Comienza Con Usted

La actitud del operador de la compañía hacia la supervisión de la precipitación pluvial puede hacer la diferencia. Es su responsabilidad comunicar a sus empleados que la supervisión de la precipitación pluvial es una prioridad. Asegúrese que sus empleados entiendan por qué es importante la supervisión de la precipitación pluvial tanto para su negocio como para el medio ambiente. Comienze mostrándoles el video y hoja informativa que aquí se adjuntan.

Proteger la precipitación pluvial puede beneficiar a su negocio de varias maneras importantes:

- **Profesionalismo y orgullo en su negocio** - Tanto los trabajadores como sus clientes aprecian una compañía limpia y responsable.
- **Es la ley** - El no cumplir con las normas de precipitación pluvial puede poner su negocio en juego. Los grupos reguladores y ambientalistas en todo el país estan enfocándose cada vez más en las desmanteladoras de autos por violaciones en cuanto a la precipitación pluvial.
- **Protección ambiental** - Todos queremos arroyos, ríos, lagos, bahías, y oceanos limpios para nuestras familias y nuestro futuro. Su compañía puede proteger el medio ambiente siguiendo algunas prácticas directas y de sentido común.

Proteja el medio ambiente para proteger a su negocio

Las siguientes prácticas describen opciones que su compañía puede aplicar para ayudarse a administrar lo relativo a la precipitación pluvial. Aunque el seguir todas las prácticas descritas abajo puede ayudar a mejorar el desempeño respecto a la supervición de la precipitación pluvial, ello no garantiza que su compañía estará en cumplimiento con todas las normas aplicables de la precipitación pluvial. Comuníquese con una agencia reguladora del estado o la EPA si desea más información.

El Permiso de precipitación pluvial

Todas las instalaciones desmanteladoras de vehículos en los Estados Unidos (excepto aquellas en una área de servicio de desagüe combinado o instalaciones que no desechen precipitación pluvial de su propiedad) están obligadas por la Ley de Agua Limpia (Clean Water Act) a obtener un permiso de precipitación pluvial, ya sea de la Agencia de Protección del Medio Ambiente de los EE.UU. o de una agencia estatal correspondiente. Usted primero debe archivar un Aviso de Intención (Notice of Intent, o N.O.I.) ante la agencia estatal correspondiente. También debe preparar un Plan de Prevención de Contaminación de la precipitación pluvial (SWPPP) para describir cómo es que su compañía administrará lo referente a la precipitación pluvial.

Las siguientes prácticas están organizadas por área o actividad de la compañía. Para referencias y contactos para obtener información adicional acerca de la precipitación pluvial y otros asuntos ambientales relacionados la desmantelación de vehículos, vea el final de este documento.

¿Cuáles son las prácticas de mejor manejo (BMPs)?

El término “BMP” es utilizado para describir prácticas de manejo que muchas diferentes industrias usan para dirigir un gran número de asuntos ambientales. Nosotros utilizaremos BMP para describir las prácticas que usted puede aplicar para administrar lo referente a la precipitación pluvial en su desmanteladora de autos.

Supervisión de la Precipitación Pluvial

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El término "BMP" es utilizado para describir prácticas de manejo que muchas diferentes industrias usan para dirigir un gran número de asuntos ambientales. Nosotros utilizaremos BMP para describir las prácticas que usted puede aplicar para administrar lo referente a la precipitación pluvial en su desmanteladora de autos.

› La capacitación

¡La capacitación de los empleados es fundamental! Capacite a sus empleados en procedimientos referentes al manejo de la precipitación pluvial, especialmente durante la temporada de lluvia y nieve y antes de que éstas lleguen. Todos los empleados deben ser capacitados al inicio de su contratación y al menos una vez al año después de ella. Asegúrese de documentar la capacitación de sus empleados. También debe colocar letreros alrededor de las áreas de actividad con recordatorios para sus trabajadores. Por ejemplo, "Evite los fluidos en el drenaje" o "Barra diariamente el absorbente." Diseñe sus propios letreros que den sentido a su operación.

› Ingreso de vehículos

Inspeccione todos los vehículos de reciente ingreso por posibles fugas de fluidos y materiales no deseados, cuando vayan entrando a las instalaciones. Contenga rápidamente las fugas con charolas o materiales absorbentes.

› Extracción de fluidos

Establezca un procedimiento para procesar vehículos y apéguese a él. Primero, antes de que cualquier vehículo sea colocado en la yarda por un término largo de almacenamiento o para compactarse, y antes que se desmantelen las partes que contengan fluidos, extraiga los siguientes fluidos del vehículo, en el orden que mejor funcione para su operación:

- Combustible
- Aceite de motor
- Líquido de transmisión
- Líquido de frenos
- Anticongelante
- Gas freón

Extraer estos fluidos antes de colocar el vehículo en la yarda disminuye 1) la posibilidad de derrames cuando las partes son removidas posteriormente, y 2) el tiempo y costo requerido en su negocio para limpiar fugas y derrames.

› Área de extracción de fluidos y de desmantelamiento de vehículos

Lo ideal es que estas actividades se realicen en la misma área, la cual debe estar cubierta con un techo. Sus áreas de extracción de fluidos y de desmantelación de vehículos tienen mayor potencial de contaminar la precipitación pluvial que cualquier otra área de su compañía. El cubrir apropiadamente esta área puede eliminar el contacto con la caída de la lluvia y es una gran forma de economizar, al prevenir la contaminación de la precipitación pluvial. La lluvia y la nieve pueden acarrear materiales dañinos como aceite o gasolina al suelo y cerca de arroyos, ríos, y lagos. Los techos no solo

detienen la lluvia y la nieve, sino que también hacen el área de trabajo más cómoda para sus trabajadores.

Si usted no desmantela actualmente partes que contengan fluidos y extrae fluidos debajo de un techo, usted no necesariamente tiene que construir un edificio nuevo y costoso. Una opción disponible es el techo de bajo costo "Versa Tube" ofrecido por Tuff Shed. (Vea http://www.tuffshed.com/versatube.htm o llame (800) BUY TUFF para más información.) Otra opción incluye construir su propio techo temporal utilizando materiales de bajo costo. Puede obtener planos y materiales de dichos techos temporales de vendedores como South Bay Canopy (408) 998-8280.

Usted también debe tener una plataforma de concreto en el área de extracción y desmantelamiento, y dee drenar todos los vehículos sobre la superficie. El drenar sobre concreto hace que los derrames y fugas sean más fáciles de limpiar y minimiza la posibilidad de daño ambiental. Utilice equipo apropiado para la extracción y manejo de fluidos, tales como sistemas de succión, racas de drenaje y embudos para contenedores.

Prevenga la contaminación de la precipitación pluvial minimizando la exposición de las actividades de desmantelamiento y de extracción de fluidos a la precipitación pluvial. Además de un techo, otras opciones posibles incluyen instalar zanjas interceptoras, bordear el perímetro del área, o utilizar canales, o cortes para desviar el flujo de la precipitación pluvial fuera del alcance de estas áreas.

› Almacenamiento de fluidos

El almacenar los fluidos apropiadamente ayuda a reducir la cantidad de contaminantes que terminan en la precipitación pluvial. Cuando extraiga fluidos, colóquelos en el contenedor apropiado. Destine el almacenamiento de fluidos a áreas designadas que estén cubiertas y que tengan un adecuado contenimiento secundario. Mantenga los barriles que contengan fluidos alejados de los drenajes de agua; considere almacenar los fluidos cerca del área donde los fluidos son extraidos. Mantenga en buenas condiciones todos los contenedores de almacenamiento. No deje charolas abiertas que contengan fluidos alrededor del taller.

Usted es responsable de asegurarse que sus fluidos sean manejados por procesadores, transportistas, y compañías de tratamiento/desechos autorizados.

› Limpieza de derrames

Limpie los derrames rápida y completamente. Guarde kits para derrames, del tamaño apropiado, en todas las áreas donde realice las siguientes actividades:

- Desmantelamiento y extracción de fluidos
- Almacenamiento de fluidos
- Almacenamiento de baterías y partes
- Abastecimiento de combustible
- Mantenimiento de equipo

Para derrames menores utilice trapos y "oil dry". Los materiales absorbentes usados deberán colocarse en un contenedor designado para su desecho.

¿Qué debería haber en su kit para derrames?

- Tubos ("socks") absorbentes
- Cojines y almohadas absorbentes
- "Oil dry"
- Escoba y pala
- Lentes de seguridad
- Guantes de plástico
- Bolsas para desecho y otros contenedores

- **¡Nunca utilice fluidos de vehículo para controlar el polvo!**
- **No mezcle su aceite usado con solventes, limpiador de frenos, ni anticongelante.** **Esto crea un desperdicio peligroso el cual no puede ser reciclado y es muy costoso deshacerse de él.**
- **No vierta fluidos dentro del sistema séptico, el drenaje sanitario, los pozos, en la tierra, ni en la basura.**

› Almacenamiento de partes

Almacene motores, transmisiones, y otras partes grasosas (reventa, core, o chatarra) de forma que se evite la exposición a la lluvia o caída de nieve. Esto puede incluir:

1) Almacenar partes a puerta cerrada
2) Almacenar partes bajo un techo permanente sobre una superficie impenetrable
3) Almacenar partes en contenedores cubiertos a prueba del clima y de fugas
4) Colocar partes en las carrocerías de los vehículos
5) Proveer cobertura temporal (como lonas) para estas partes como medida alterna

Los componentes de la batería de acido de plomo son tóxicos y corrosivos y pueden contaminar el suelo y agua si son manejados incorrectamente. Almacene las baterías dentro o fuera de un edificio en contenedores cubiertos y sin fugas. Separe las baterías de otros desperdicios como el papel, trapos, basura y químicos inflamables o peligrosos. Monitoree su área de almacenamiento de baterías por posibles fugas o deterioraciones, y tome acción rapida para evitar cualquier derrame o fuga. La cal puede utilizarse para neutralizar el acido de batería derramado. *¡Nunca vierta acido de batería en la tierra o dentro del drenaje de agua!*

Los radiadores extraidos de los vehículos deben almacenarse bajo techo, lona, u otro cobertizo, y a cierta altura del suelo de tal manera que no haya contacto con la lluvia o el drenaje de la superficie.

› Compactación

Nunca compacte un vehículo sin haber extraido todos los fluidos y quitado los tanques de gasolina, las llantas y las baterías. Contenga y deseche apropiadamente los residuos de fluidos que escurran mientras se está compactando. Usted es responsable de asegurarse que se contangan todos los fluidos y que no escurran fuera de su propiedad, aún si compacta sus vehículos a través de un contratista.

› Almacenamiento de vehículos

En caso de que haya motores o partes que contengan fluidos dentro del vehículo cuando éste se coloque en la yarda, coloque un cofre u otro cobertor tal como una lona bien asegurada sobre el motor del vehículo. Coloque charolas debajo de los vehículos que tengan fugas. No ponga vehículos en la tierra donde haya una corriente fuerte de precipitación pluvial o cerca de un drenaje. Después de que los vehículos sean retirados, levante la tierra o grava que ha sido manchada por fugas y goteos. Maneje el material contaminado de acuerdo con las regulaciones correspondientes.

- **¡Nunca dirija derrames hacia los drenajes!**
- **Barra el material absorbente y deséchelo apropiadamente al menos una vez al día.**

› Mantenimiento del equipo

Programe y realice inspecciones periódicas del equipo. El mantenimiento regular del equipo, tal como los montacargas, reduce el riesgo de que se descomponga y que tire fluidos. Revise por posibles fugas y derrames, el mal funcionamiento, desgaste, o partes corroídas. El mantenimiento del equipo debe hacerse en un lugar cerrado o, cuando sea práctico, en una superficie impenetrable. Si el mantenimiento no puede hacerse bajo techo, tome medidas adecuadas de control de derrames y/o limpieza.

› Abastecimiento de combustible

Pavimente las áreas de abastecimiento de combustible con concreto para prevenir la contaminación del suelo y facilitar la limpieza. No deje los vehículos sin atender mientras se estén cargando de combustible.

› Mantenimiento

Barra y limpie las superficies pavimentadas diariamente para reducir la sedimentación y acumulación de contaminantes. El mantenimiento como rutina es importante. Recipientes, zanjas, separadores de agua/aceite, repelentes de aceite, lonas, y demas materiales para retener contaminantes deben recibir mantenimiento regular o pueden llegar a ser ineficaces. Limpie las zanjas de drenaje periódicamente, antes, durante y después de la temporada de lluvias.

› Control de la erosión

¡Elimine los TSS! Quizás haya oído hablar de los TSS o sólidos totalmente suspendidos: en otras palabras, la tierra. Controlar la cantidad de tierra que se escurre fuera de su propiedad es importante porque los metales y otros contaminantes dañinos pueden adherirse a las particulas de tierra y terminar escurriéndose fuera de la propiedad hacia la precipitación pluvial. El suelo erosionado puede también extinguir la vida acuática.

Tome medidas adecuadas en cuanto a la vegetación, estructuración o estabilización, tales como desagües, retenedores de sedimentación, geotextiles, o bordos de filtración en áreas sin mucha vegetación, donde la erosión del suelo es evidente.

› Los escurrimientos que no provienen de la precipitación pluvial

El agua para lavar equipo, áreas de trabajo, o pisos del taller no puede entrar en contacto o mezclarse con la lluvia o el drenaje superficial ni el drenaje común. El agua para lavarse las manos o lavar vehículos puede descargarse en el drenaje sanitario donde sea permitido (asegúrese de contactar a su distrito local de drenaje sanitario). La mayoría de los estados prohiben los escurrimientos de su propiedad que no provengan de la precipitación pluvial, incluyendo, pero sin limitarse a, los escurrimientos de agua para lavar, para enjuagar y de fluidos derramados. Si usted tiene permiso para usar drenajes, asegúrese que su drenaje esté conectado al drenaje sanitario. Si esto no es posible en su área, el agua para lavar debe ser manejada dentro de su propiedad. Las opciones de manejo incluyen el reciclaje, el reuso o su desecho fuera de la propiedad. Si usted deja que el agua se acumule en la tierra (filtración), tome los pasos adecuados para prevenir contaminación en la tierra o que se infeste con mosquitos u otras plagas. Para información adicional consulte su agencia reguladora local.

- Los residuos secos del agua para lavar no pueden entrar en contacto con la lluvia o drenaje de la superficie.

- **Usted debe saber hacia dónde están dirigidos sus drenajes. Tape cualquier drenaje en el suelo que pudiera dejar escurrir un derrame hacia un sistema séptico o drenaje de agua.**
  Los fluidos y solventes de los autómoviles pueden contaminar el agua potable si caen en drenajes que se descargan sobre el suelo.

- Después de lavar, recoja y limpie cualquier sedimentación acumulada, depósitos de aceite, chatarra, y partículas de pintura.
- No lave partes a vapor o a presión sin el manejo apropiado del agua para lavar.
- No lave el piso del taller con manguera si el agua va a escurrir hacia el drenaje o fuera de la propiedad.

› Sistemas de filtración de la precipitación pluvial

Los sistemas de filtración no costosos o absorbentes pueden ofrecer un nivel de defensa adicional contra la contaminación de la precipitación pluvial. Algunos ejemplos incluyen: tubos absorbentes, cercos, pacas de paja, filtros de roca, y zanjas para filtrar. El mantenimiento regular de estos productos es esencial: si no reciben mantenimiento, no van a funcionar. Además, estas medidas no sustituyen a las prácticas del buen manejo de la precipitación pluvial.

› Inspección

Inspeccione sus instalaciones con regularidad para asegurarse que se estén aplicando todas las BMPs correctas. Aumente las inspecciones durante los periodos de clima lluvioso. Basándose en el permiso o necesidades de supervisión, mantenga un registro de las inspecciones visuales. Inspeccione los contenedores de aceite, los sistemas de agua fresca, las líneas de irrigación, las áreas de abastecimiento de combustible, y demás sistemas de tuberías por posibles fugas. Si existe evidencia de alguna fuga, repárela rápidamente o reemplace las partes dañadas para prevenir escurrimientos contaminados y descargas de agua que no provengan de la precipitación pluvial.

› Educación de los clientes

Notifique a sus clientes que sustraen partes que lo hagan correctamente y que desechen los fluidos debidamente. Por ejemplo, coloque recipientes para fluidos a disposición de los clientes, coloque letreros que requieran el uso de charolas para quitar partes, y prohiba actividades que generen desperdicios, como el dar mantenimiento a vehículos en el estacionamiento.

Switches de mercurio

Los switches o interrruptores de mercurio son un aspecto importante. Muchos vehículos viejos contienen mercurio, el cual es altamente tóxico y puede causar discapacidades del aprendizaje y el retardo mental en niños recién nacidos. Cuando los vehículos son compactados y el mercurio se mantiene adentro, éste puede caer en el suelo y en las corrientes de agua. El mercurio también puede esparcirse en el aire y en los mantos acuíferos después de que los vehículos compactados van a la cortadora.

Puede obtener información acerca de como remover el mercurio de los vehículos por el internet en:

epa.gov/glnpo/bnsdocs/hgsbook/auto.pdf

epa.gov/region5/air/mercury/autoswitch.htm

switchout.ca

Qué hacer acerca del mercurio

Los switches de mercurio se hayan normalmente debajo de los cofres y cajuelas de los vehículos y menos frecuentemente en sistemas de frenado automático (ABS). Estos switches se pueden extraer antes de compactar los vehículos. Algunas desmanteladoras de autos quitan los switches aunque no se les requiera. Si usted decidiera participar en este importante aspecto ambiental y removiera los switches de mercurio antes de compactar sus vehículos, debe almacenar los switches en un contenedor cerrado claramente marcado y a prueba de fugas. También asegúrese de que los switches no se quiebren cuando se manejen o almacenen. Una recicladora de metales con licencia que recolecte mercurio puede desechar los switches. Contacte a su agencia ambiental del estado si desea más información.

¡Usted
>> PUEDE <<
Hacer la Diferencia!

Las recicladoras de autos hacen su labor para conservar los recursos naturales al reciclar materiales valiosos. Coopere en esta buena labor y proteja al medio ambiente de los escurrimientos contaminados, aplicando las BMPs descritas en este documento. Asegúrese que sus empleados entiendan que el manejo de la precipitación pluvial es importante y que se les capacite para aplicar las BMPs.

Recuerde, ¡la protección de la precipitación pluvial

Comienza con USTED!

"Es fundamental para los propietarios poner el ejemplo y participar activamente en la aplicación de las BMPs."

— Brian Werth, Select Auto & Truck Recyclers

Dónde puede encontrar más información

Consulte las siguientes fuentes si desea más información acerca de las BMPs para recicladoras de autos:

Manuales

- An Environmental Compliance Workbook for Automotive Recyclers, Florida DEP
  www.dep.state.fl.us/central/home/ps/asyca/fl_gyb.pdf
- Environmental Compliance Guide for Motor Vehicle Salvage Yards, OH Small Bus. Assistance Office
  www.epa.state.oh.us/other/sbao/salvageguide.pdf
- Vehicle Recycling Manual: A Guide for Vehicle Recyclers, Washington State Department of Ecology
  www.ecy.wa.gov/pubs/97433.pdf
- Automotive Recyclers Guide to a Cleaner Environment, New York DEC
  www.dec.state.ny.us/website/reg8/press/autorec/autorec0.pdf
- Certified Auto Recycler (CAR) Guidance Manual, Automotive Recyclers Association
  www.autorecyc.org (Disponible para miembros solamente)

Otras fuentes

- La National Compliance Assistance Clearinghouse es su guía sobre cómo obtener información acerca de los requerimientos por el internet. Ésta le proporciona al rápido acceso a las herramientas requeridas y los contactos de la EPA y de otros proveedores de asistencia en cuanto a los requerimientos. Dicha agencia tiene una sección entera dedicada a la industria del salvamento de autos. http://cfpub.epa.gov/clearinghouse
- Puede hallar una lista de contactos ambientalistas del estado y locales por el internet en:
  epa.gov/epapages/statelocal/envrolst.htm
- El EPA Small Business Ombudsman le puede ayudar a comprender las regulaciones ambientales, o proporcionarle contactos locales. La línea libre de cobro para pequeños empresarios provee información sobre asistencia regulatoria y técnica: (800) 368 5888.

Información sobre vendedores

Techos de bajo costo:

Tuff Shed	(800) BUY-TUFF
South Bay Canopy	(408) 998-8280

Extracción de fluidos y equipo de almacenamiento:

Hy-Tec Environmental	(800) 336-4499
Spill Cleanup Direct	(800) 356-0783

Kits para derrames y materiales absorbentes:

Stormtech	(888) 549-5374
New Pig	(800) 468-4647

Nota: Sustainable Conservation y U.S. EPA no endosa ninguno de estos productos.
Esta lista no esta completa: otros vendedores pueden proveer productos y servicios similares o idénticos.

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Sustainable Conservation
www.suscon.org

Clean Water State Revolving Fund

FACT SHEET

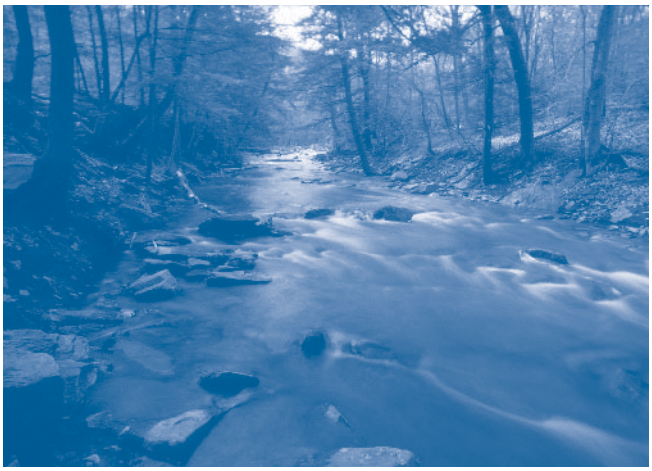
Cleaning Up Polluted Runoff with the Clean Water State Revolving Fund

What's In It For You?

The Clean Water State Revolving Fund (CWSRF) program has become a major source of funding to address polluted runoff. To date, 30 of the 51 CWSRF programs have provided funding for nonpoint source and estuary protection projects. Today annual funding to address polluted runoff exceeds $200 million. CWSRF loans are issued at below market rates (zero percent to less than market), offering borrowers significant savings over the life of the loan.

History

In creating the CWSRF program, Congress ensured that it would be able to fund most types of water quality projects, including nonpoint source, wetlands, estuary, and other types of watershed projects, as well as more traditional municipal wastewater treatment systems. The CWSRF program provisions in the Clean Water Act give no more preference to one category or type of project than any other.



Capacity of the CWSRF

The 51 CWSRF programs work like banks (each state and Puerto Rico has one). Federal and state contributions are used to capitalize or set-up the programs. These assets are used to make low-interest loans for important water quality projects. Repaid funds are then recycled to fund other important water quality projects.

The CWSRF programs have in excess of $42 billion in assets and average funding for the past three years exceedes $4 billion annually. The funding of polluted runoff projects with the CWSRF is gaining momentum. Since 1989, the CWSRF program has funded 3,400 projects, investing more than $1.6 billion in polluted runoff projects.

Who May Qualify?

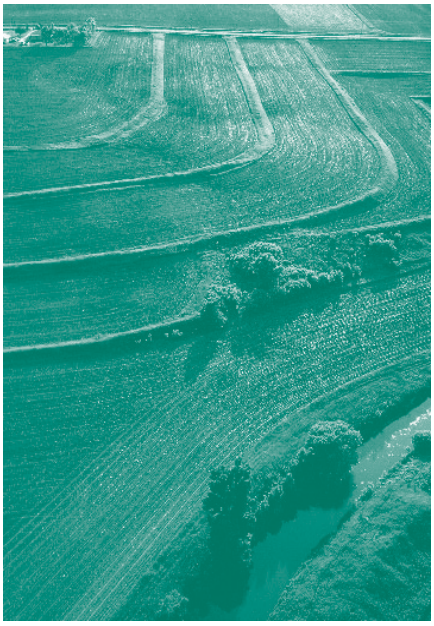
Included in a long list of eligible loan recipients are communities, citizens groups, businesses, farmers, homeowners, watershed groups, and nonprofit organizations. Since the program is managed largely by the states, project eligibility may vary according to the priorities within each state. Contact your state's CWSRF program for details.

Polluted Runoff and the CWSRF

The CWSRF can fund virtually any type or category of polluted runoff that is included in a state approved nonpoint source (NPS) management plan.

Polluted runoff occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into surface or ground

water. For instance, polluted runoff from agricultural sources is the leading contributor to water quality impairments in rivers, degrading over 60% of impaired river miles.



Terraces, conservation tillage and conservation buffers save soil and improve water quality

Here are a few actual project examples from states that demonstrate what the CWSRF can do:

- **California -** Stormwater management facilities, including sediment basins and constructed wetlands. Purchasing easements for wetland protection
- **Delaware -** Animal waste management facilities, including manure storage facilities and dead chicken composters
- **Massachusetts -** Septic system improvements and replacement
- **Minnesota -** Agricultural best management practices (BMPs) to prevent and reduce runoff. Purchasing conservation tillage equipment and implementing soil erosion controls
- **New York** - Purchasing land and easements for source water protection projects
- **Washington -** Rehabilitation of streambanks, riparian corridors and buffers
- **Wisconsin** - Water protection and improvement projects on brownfield redevelopment sites
- **Wyoming -** Removal of leaking underground storage tanks and remediation of contaminated ground water and soil

State of the art lagoon animal waste management system

These are just a sample of the projects that have been funded. Contact your state or visit the CWSRF web site for more examples and information **(www.epa.gov/owm/cwfinance/index.htm)**

Benefits of Loans

First, Funds are Available. CWSRF loans can usually be obtained much faster than grants and each year over $200 million is spent on nonpoint source projects.

Second, No Cash Up-Front. Most grant programs require significant cost shares (as much as 40 percent or more). A CWSRF loan can cover 100 percent of project costs with no cash up-front.

Third, Significant Cost Savings. CWSRF loans provide significant cost savings over the life of the loan. The total cost of a zero percent CWSRF loan will be approximately 50 percent less than the same project financed by a commercial loan at 7.5 percent.

Fourth, Loans can Complement other Funding Sources. It may be possible to combine a CWSRF loan with grant dollars from other sources. Check with your state.

Sources of Repayment

Many users of the CWSRF program have demonstrated a high level of creativity in developing sources of repayments. The source of repayment need not come from the project itself. Some possible sources include:

- Fees paid by property owner or homeowner
- Fees paid by a developer
- Dedicated portion of local, county, or state taxes or fees
- Recreational fees (fishing license, park entrance fees)
- Stormwater management fees
- Wastewater user charges
- Donations or dues made to nonprofit groups
- Business revenues

Making Funding Accessible - Ohio Examples

The state of Ohio employs several innovative funding methods to ensure a variety of watershed projects receive funding. Two unique funding methods used in Ohio are the Linked-Deposit Loan Program and the Watershed Resource Restoration Sponsorship Program (WRRSP). In both examples the state shows creativity by taking existing institutional arrangements and modifying them to achieve the state's goals and meet the needs of loan recipents.

Linked Deposit Lending Program

In Ohio's linked-deposit program, the state makes arrangements with local banks to provide loans for agricultural BMPs and on-site wastewater treatment projects. Under a linked-deposit arrangement the state agrees to buy a bank's investment (CD) and receive a lower than market rate of return on the investment. The bank agrees to provide reduced interest rate loans for eligible projects. The linked-deposit loan interest rate reflects the difference between the state's reduced rate of return on the investment and the market rate of return.

The linked-deposit approach benefits CWSRF programs because they support high priority nonpoint source projects and because they place risk and management responsibilities with local financial institutions. Financial institutions earn profits from the linked deposit agreements and add an additional service for their customers. Borrowers find linked deposit programs to be economical and comfortable; they save money with low-interest loans, and they are comfortable working with local financial institutions.

For more information on linked-deposit loans see EPA's Activity Update ***"Innovative Use of Clean Water State Revolving Funds for Nonpoint Source Pollution"*** (EPA 832-F-02-004) found on the CWSRF web site.

Watershed Resource Restoration Sponsorship Program (WRRSP)

The WRRSP offers communities very low interest rates on loans for wastewater treatment plant improvements if the communities also sponsor projects that protect or restore water resources. The end payment for the wastewater treatment plant project is the same because of the lower interest rate and the simultaneous funding for the restoration project by the wastewater treatment plant. The benefit of this program is water restoration projects that normally would not receive funding are completed with the help of the wastewater treatment plants.

To date, the WRRSP program has supported projects that have acquired wetlands and riparian lands, acquired conservation easements, restored habitat, and removed dams.

Over the past two years under the WRRSP, communities in Ohio have used $24 million of CWSRF loan funds to protect and restore 1850 acres of riparian lands and wetlands and 38 miles of Ohio's stream corridors.

For more information on Ohio's WRRSP see EPA's Activity Update ***"Ohio's Restoration Sponsor Program Integrates Point Source and Nonpoint Source Projects"*** (EPA 832-F-02-001) found on the CWSRF web site.

Challenges Ahead

With increasing emphasis on watershed-based program management and implementation of Total Maximum Daily Loads (TMDLs) in impaired water bodies, it will be even more important to take advantage of the tremendous buying power of the CWSRF program.

How to Get More From the CWSRF

- Share information on polluted runoff priorities with CWSRF managers
- Work to enhance CWSRF programs to include funding of polluted runoff projects
- Become involved in the annual CWSRF planning and priority setting process
- Help market the program and encourage loan applications

The water quality community needs to work together to increase understanding of polluted runoff issues and facilitate the use of the powerful resources of the CWSRF to address these significant problems. EPA has been encouraging the states to open their CWSRFs to the widest variety of water quality projects and to use their CWSRFs to fund the highest priority projects in targeted watersheds. Those interested in cleaning up polluted runoff must seek out their CWSRF programs, gain an understanding of how their state program works, and participate in the annual process that determines which projects are funded.

For more information about the Clean Water Revolving Fund, or for a program representative in your State, please contact:

Clean Water State Revolving Fund Branch

U.S. Environmental Protection Agency

1200 Pennsylvania Avenue, NW (Mailcode 4204M)

Washington, DC 20460

Phone: (202) 564-0752 **Fax:** (202) 501-2403

Internet: www.epa.gov/owm/cwfinance/index.htm

Clean Water
State Revolving Fund

What is WaterSense?

WaterSense is a voluntary public-private partnership program sponsored by the U.S. Environmental Protection Agency. Its mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products and services.

www.epa.gov/watersense

U.S. EPA WaterSense

5 Simple Ways to Save Water

United States Environmental Protection Agency
(4204M)

EPA-832-F-06-007
May 2006
www.epa.gov/watersense

Saving water is simple and smart.

1 Be smart when irrigating your lawn or landscape.

- Water the lawn or garden during the coolest part of the day. Early morning is best.
- Water plants according to their water needs; you'll have healthier plants and a lower water bill.
- Set sprinklers to water lawns and gardens only—not the street or sidewalk.
- Use soaker hoses or trickle irrigation systems for trees and shrubs.

2 Use your appliances wisely.

- Wash only full loads or set small loads to the appropriate water level.
- Scrape rather than rinse dishes before loading them into the dishwasher.
- Replace old clothes washers with ENERGY STAR qualified appliances that use less water.

3 Don't flush your money down the drain/Toilets.

- A leaky toilet can waste 200 gallons of water per day. Check your toilet for leaks by adding food coloring to the tank. If the toilet is leaking, color will appear in the bowl within 15 minutes. Look for worn out, corroded or bent parts in the leaky toilet. Most replacement parts are inexpensive, readily available and easily installed. (Flush as soon as test is done, since food coloring may stain the tank.)
- When replacing your toilet, look for high-efficiency models that use less than 1.3 gallons per flush.

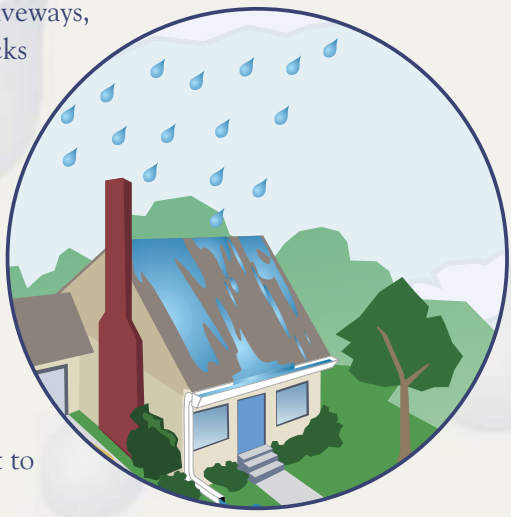
4 Conserve around the house.

- Keep drinking water in the refrigerator instead of letting the faucet run until cool. A running tap can use about 2 gallons of water per minute.
- Try not to leave the tap running while you brush your teeth or shave.
- Don't pour water down the drain if you can use it for other projects such as watering a plant or cleaning.

5 Stop those leaks.

- Verify that your home is leak-free. Many homes have hidden water leaks that can waste more than 10 percent, costing both you and the environment. Read your water meter before and after a two-hour period where no water is being used. If the meter does not read exactly the same, you probably have a leak.
- Repair dripping faucets and showers. If your faucet is dripping at the rate of one drop per second, you can expect to waste 2,700 gallons per year. This waste will add to the cost of water and sewer utilities or strain your septic system.

As stormwater flows over driveways, lawns, and sidewalks, it picks up debris, chemicals, dirt, and other pollutants. Stormwater can flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water. Polluted runoff is the nation's greatest threat to clean water.



By practicing healthy household habits, homeowners can keep common pollutants like pesticides, pet waste, grass clippings, and automotive fluids off the ground and out of stormwater. Adopt these healthy household habits and help protect lakes, streams, rivers, wetlands, and coastal waters. Remember to share the habits with your neighbors!

Healthy Household Habits for Clean Water

Vehicle and Garage

- Use a commercial car wash or wash your car on a lawn or other unpaved surface to **minimize** the amount of dirty, soapy water flowing into the storm drain and eventually into your local waterbody.

- Check your car, boat, motorcycle, and other machinery and equipment for leaks and spills. Make repairs as soon as possible. Clean up **spilled fluids** with an absorbent material like kitty litter or sand, and don't rinse the spills into a nearby storm drain. Remember to properly dispose of the absorbent material.

- **Recycle** used oil and other automotive fluids at participating service stations. Don't dump these chemicals down the storm drain or dispose of them in your trash.

Lawn and Garden

- Use pesticides and fertilizers **sparingly**. When use is necessary, use these chemicals in the recommended amounts. Avoid application if the forecast calls for rain; otherwise, chemicals will be washed into your local stream.

- Select **native** plants and grasses that are drought- and pest-resistant. Native plants require less water, fertilizer, and pesticides.

- **Sweep up** yard debris, rather than hosing down areas. Compost or recycle yard waste when possible.

- Don't overwater your lawn. Water during the **cool** times of the day, and don't let water run off into the storm drain.

- Cover piles of dirt and mulch being used in landscaping projects to prevent these pollutants from blowing or washing off your yard and into local waterbodies. **Vegetate** bare spots in your yard to prevent soil erosion.

Home Repair and Improvement

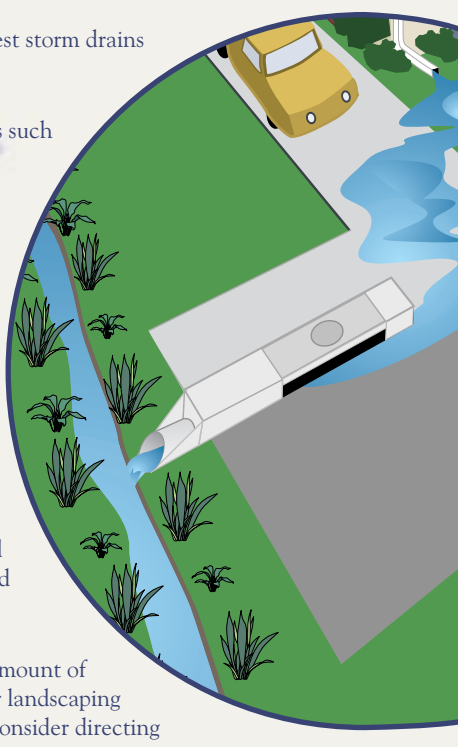
- Before beginning an outdoor project, locate the nearest storm drains and **protect** them from debris and other materials.

- **Sweep up** and properly dispose of construction debris such as concrete and mortar.

- Use hazardous substances like paints, solvents, and cleaners in the **smallest amounts possible**, and follow the directions on the label. Clean up spills **immediately**, and dispose of the waste safely. Store substances properly to avoid leaks and spills.

- Purchase and use **nontoxic**, **biodegradable**, **recycled**, and **recyclable** products whenever possible.

- **Clean** paint brushes in a sink, not outdoors. Filter and reuse paint thinner when using oil-based paints. Properly dispose of excess paints through a household hazardous waste collection program, or donate unused paint to local organizations.



- **Reduce** the amount of paved area and increase the amount of vegetated area in your yard. Use native plants in your landscaping to reduce the need for watering during dry periods. Consider directing downspouts away from paved surfaces onto lawns and other measures to increase infiltration and reduce polluted runoff.

Pet Care

- When walking your pet, remember to **pick up** the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Swimming Pool and Spa

- **Drain** your swimming pool only when a test kit does not detect chlorine levels.
- Whenever possible, drain your pool or spa into the **sanitary** sewer system.
- Properly store pool and spa chemicals to **prevent** leaks and spills, preferably in a covered area to avoid exposure to stormwater.

Septic System Use and Maintenance

- Have your septic system **inspected** by a professional at least every 3 years, and have the septic tank **pumped** as necessary (usually every 3 to 5 years).
- Care for the septic system drainfield by **not** driving or parking vehicles on it. Plant only grass over and near the drainfield to avoid damage from roots.
- Flush responsibly. Flushing household chemicals like paint, pesticides, oil, and antifreeze can **destroy** the biological treatment taking place in the system. Other items, such as diapers, paper towels, and cat litter, can **clog** the septic system and potentially damage components.

Storm drains connect to waterbodies!

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EPA 833-B-03-003
January 2003

THE YEAR OF CLEAN WATER
Celebrate Restoration!

www.epa.gov/nps

Remember: Only rain down the drain!

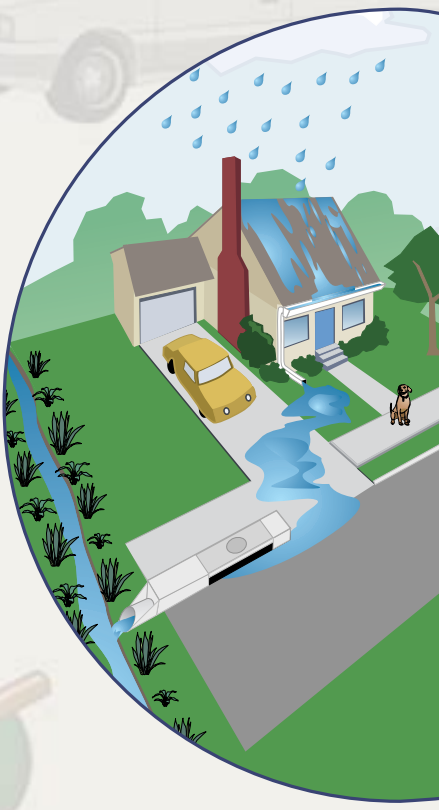
For more information, visit
www.epa.gov/npdes/stormwater
or

Make your home

The

SOLUTION TO STORMWATER POLLUTION!

A homeowner's guide to healthy habits for clean water



EPA United States Environmental Protection Agency

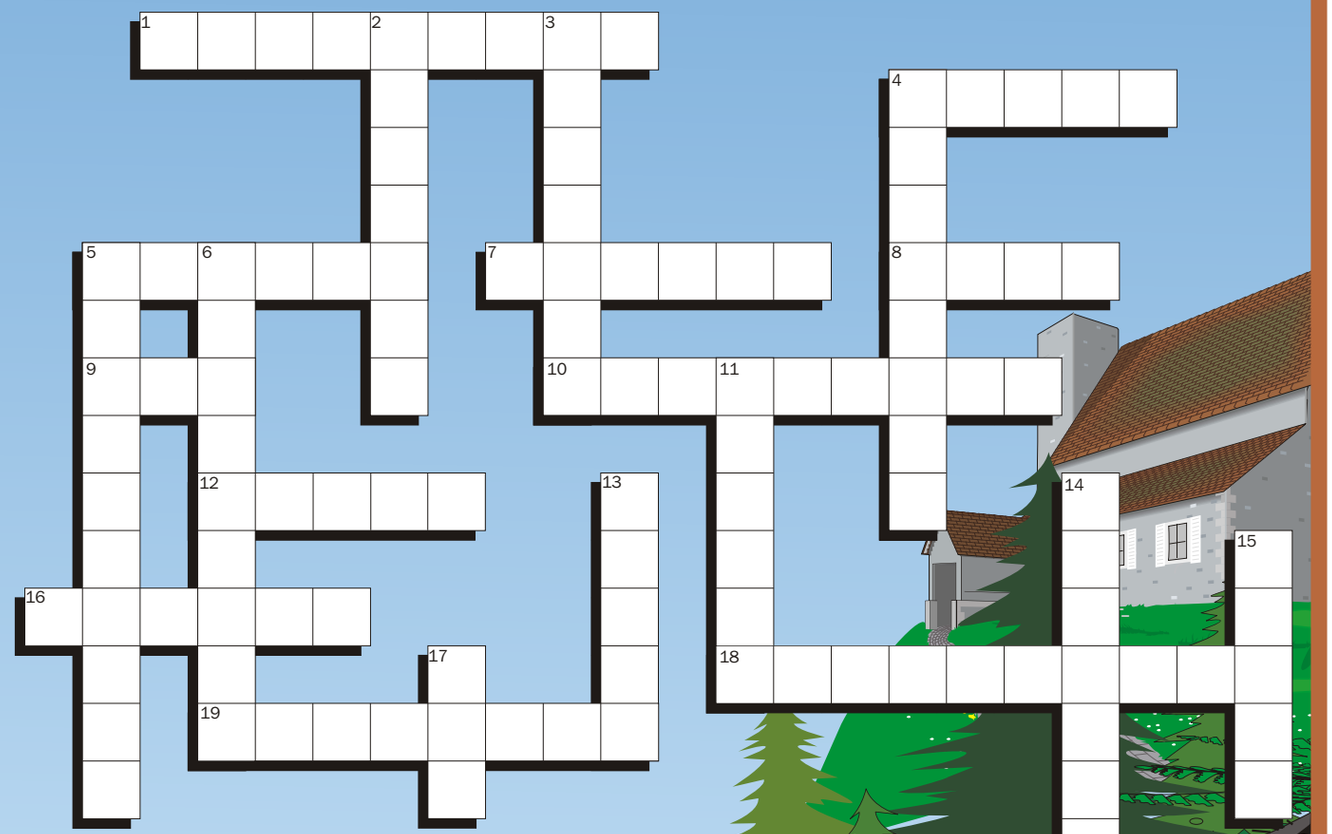
Take the Stormwater Runoff Challenge

Across:

1) The area of land that drains into an estuary, lake, stream, or groundwater is known as a _____.
4) The _____ of speeding boats can erode shorelines.
5) Maintaining your _____ tank will help to prevent bacteria and nutrients from leaking into groundwater and surface waters.
7) Wetland plants act like a natural water _____, removing harmful pollutants from stormwater runoff.
8) Leave your grass clippings on your _____ to reduce the need for commercial fertilizers.
9) A single quart of motor _____, if disposed of improperly, can pollute 2 million gallons of water.
10) Fertilizers and animal wastes contain _____ that "feed" algae and other aquatic plants harmful to water quality.
12) Polluted runoff from both rural and _____ sources has a significant impact on water quality.
16) Storm _____ don't always connect to sewage treatment plants, so runoff can flow directly to rivers, lakes, and coastal waters.
18) Follow directions carefully when applying _____ on your lawn—more isn't always better.
19) Polluted runoff (also called_____ source pollution) comes from so many places that it's hard to "pinpoint" a source.
20) Yard and vegetable food waste are suitable additions to a _____ pile.

Down:

2) Don't dump used motor oil into storm drains. _____ it!
3) _____ of soil from barren land can cloud nearby streams.
4) _____ prevent flooding, improve water quality, and provide habitat for waterfowl, fish, and wildlife.
5) Marking "Do Not Dump, Drains to Bay" on a _____ is one way to educate people about polluted runoff.
6) Excess sediment, nutrients, toxics, and pathogens are all types of runoff _____.
11) Polluted _____ is the nation's #1 water quality problem.
13) The cattail is one wetland _____ that helps purify polluted runoff.
14) Too much _____ in water can harm aquatic life.
15) Proper crop and animal management on _____ helps to control water pollution.
17) _____ impact development helps control stormwater pollution through conservation approaches and techniques.



Choices:

compost	nonpoint	sediment
drains	nutrients	septic
erosion	oil	storm drain
farms	plant	urban
fertilizer	pollution	wakes
filter	recycle	watershed
lawn	runoff	wetlands
Low		

EPA United States Environmental Protection Agency

For more information, please visit EPA's Polluted Runoff web site at www.epa.gov/nps

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Water-Efficient Landscaping:

Preventing Pollution & Using Resources Wisely

A Message from the Administrator

Christine Todd Whitman

I believe water is the biggest environmental issue we face in the 21st Century in terms of both quality and quantity. In the 30 years since its passage, the Clean Water Act has dramatically increased the number of waterways that are once again safe for fishing and swimming. Despite this great progress in reducing water pollution, many of the nation's waters still do not meet water quality goals. I challenge you to join with me to finish the business of restoring and protecting our nation's waters for present and future generations.

United States Environmental Protection Agency
Office of Water (4204M)
EPA832-F-02-002
September 2002
www.epa.gov/owm/water-efficiency/index.htm

Contents

What is Water-efficient Landscaping?

Water, many agree, is our most precious natural resource; without it, life ceases. Yet judging by our water use and consumption practices, many of us in the United States seem to take it for granted. A typical household uses approximately 260 gallons of water per day. "Water conscious" individuals often install high-efficiency shower heads and toilets and wash only full loads of clothes and dishes to reduce consumption. But in the summer, the amount of water used outdoors by a household can exceed the amount used for all other purposes in the entire year. This is especially true in hot, dry climates.

Gardening and lawn care account for the majority of this seasonal increase, but other outdoor activities, such as washing cars and filling swimming pools, also contribute. According to the U.S. Geological Survey, of the 26 billion gallons of water consumed daily in the United States[1], approximately 7.8 billion gallons, or 30 percent[2], is devoted to outdoor uses. The majority of this is used for landscaping. In fact, it is estimated that the typical suburban lawn consumes 10,000 gallons of water above and beyond rainwater each year (Vickers, p 140).

Many mistakenly believe that stunning gardens and beautiful lawns are only possible through extensive watering, fertilization, and pesticide application. As this booklet will demonstrate, eye-catching gardens and landscapes that save water, prevent pollution, and protect the environment are, in fact, easily achieved by employing water-efficient landscaping. Water-efficient landscaping produces attractive landscapes because it utilizes designs and plants suited to local conditions.

This booklet describes the benefits of water-efficient landscaping. It includes several examples of successful projects and programs, as well as contacts, references, and a short bibliography. For specific information about how to best apply water-efficient landscaping principles to your geographical area, consult with your county extension service and local garden and nursery centers. Local governments and water utilities also possess a wealth of information and suggestions for using water more efficiently in all aspects of your life, including landscaping.

Xeriscape garden at Denver Water

1 W.B. Solley, R.R. Pierce, and H.A. Perlman. 1998. *Estimated Use of Water in the United States in 1995* (USGS Circular 1200). USGS. Reston, VA. p.27.

2 Amy Vickers. 2001. *Handbook of Water Use and Conservation*. WaterPlow Press. Amherst, MA. p. 140.

Xeriscaped front yard in Colorado Springs

Many terms and schools of thought have been used to describe approaches to water-efficient landscaping. Some examples include "water-wise," "water-smart," "low-water," and "natural landscaping." While each of these terms varies in philosophy and approach, they are all based on the same principles and are commonly used interchangeably. One of the first conceptual approaches developed to formalize these principles is known as "Xeriscape[3] landscaping." Xeriscape landscaping is defined as "quality landscaping that conserves water and protects the environment." The word "Xeriscape" was coined and copyrighted by Denver Water Department in 1981 to help make water conserving landscaping an easily recognized concept. The word is a combination of the Greek word "*xeros*," which means "dry," and "landscape."

The seven principles upon which Xeriscape landscaping is based are:

- Proper planning and design
- Soil analysis and improvement
- Appropriate plant selection
- Practical turf areas
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

The eight fundamentals of water-wise landscaping, below, illustrate the similarities in the underlaying concepts and principles of Xeriscape landscaping and other water-efficient approaches.

- Group plants according to their water needs.
- Use native and low-water-use plants.
- Limit turf areas to those needed for practical uses.
- Use efficient irrigation systems.
- Schedule irrigation wisely.
- Make sure soil is healthy.
- Remember to mulch.
- Provide regular maintenance.

In short, plan and maintain your landscape with these principles of water efficiency in mind and it will continue to conserve water and be attractive.

3 Denver Water welcomes the use of the term Xeriscape in books, articles, and speeches promoting water conserving landscape. EPA is using this term with permission from Denver Water. For permission to use "Xeriscape" in your publications, call Denver Water at 303 628-6330.

Why Use Water-efficient Landscaping?

Proper landscaping techniques not only create beautiful landscapes, but also benefit the environment and save water. In addition, attractive, water-efficient, low-maintenance landscapes can increase home values.

Water-efficient landscaping offers many economic and environmental benefits, including:

- Lower water bills from reduced water use.
- Conservation of natural resources and preservation of habitat for plants and wildlife such as fish and waterfowl.
- Decreased energy use (and air pollution associated with its generation) because less pumping and treatment of water is required.
- Reduced home or office heating and cooling costs through the careful placement of trees and plants.
- Reduced runoff of stormwater and irrigation water that carries top soils, fertilizers, and pesticides into lakes, rivers, and streams.
- Fewer yard trimmings to be managed or landfilled.
- Reduced landscaping labor and maintenance costs.
- Extended life for water resources infrastructure (e.g., reservoirs, treatment plants, groundwater aquifers), thus reduced taxpayer costs.

Meadow Sage (Salvia pratensis) *is the background for New Mexico Evening Primrose* (Oenothera berlandieri 'siskiyou')

How is Water-efficient Landscaping Applied?

Landscaping that conserves water and protects the environment is not limited to arid landscapes with only rocks and cacti. Through careful planning, landscapes can be designed to be both pleasing to the senses and kind to the environment. One simple approach to achieving this is applying and adopting the basic principles of water-efficient landscaping to suit your climatic region. The seven principles of Xeriscape landscaping are used below to describe these basic concepts in greater detail.

Dragon's Blood Sedum (Sedum spurium) *under Honeylocust Trees* (Gleditsia triaconthos)

Proper planning and design

Developing a landscape plan is the first and most important step in creating a water-efficient landscape. Your plan should take into account the regional and microclimatic conditions of the site, existing vegetation, topography, intended uses of the property, and most importantly, the grouping of plants by their water needs. Also consider the plants' sun or shade requirements and preferred soil conditions. A well-thought-out landscape plan can serve as your roadmap in creating beautiful, water-efficient landscapes and allow you to continually improve your landscape over time.

Soil analysis and improvements

Because soils vary from site to site, test your soil before beginning your landscape improvements. Your county extension service can analyze the pH levels; nutrient levels (e.g., nitrogen, phosphorus, potassium); and the sand, silt, clay, and organic matter content of your soil. It can also suggest ways to improve your soil's ability to support plants and retain water (e.g., through aeration or the addition of soil amendments or fertilizers).

Appropriate plant selection

Your landscape design should take into account your local climate as well as soil conditions. Focus on preserving as many existing trees and shrubs as possible because established plants usually require less water and maintenance. Choose plants native to your region. Native plants, once established, require very little to no additional water beyond normal rainfall. Also, because they are adapted to local soils and climatic conditions, native plants commonly do not require the addition of fertilizers and are more resistant to pests and disease.

When selecting plants, avoid those labeled "hard to establish," "susceptible to disease," or "needs frequent attention," as these types of plants frequently require large amounts of supplemental water, fertilizers, and pesticides. Be careful when selecting non-indigenous species as some of them may become invasive. An invasive plant might be a water guzzler and will surely choke out native species. Your state or county extension service or local nursery can help you select appropriate plants for your area.

The key to successful planting and transplanting is getting the roots to grow into the surrounding soil as quickly as possible. Knowing when and where to plant is crucial to speeding the establishment of new plants. The best time to plant will vary from species to species. Some plants will thrive when planted in a dormant or inactive state. Others succeed when planted during the season when root generation is highest and sufficient moisture is available to support new growth (generally, spring is the best season, but check plant tags or consult with your local nursery for specific species).

Wine Cup (Callirhoe involucrata) *and Sunset Hyssop* (Agastache rupestris) *in the Denver Water Xeriscape Garden*

Practical turf areas

How and where turf is placed in the landscape can significantly reduce the amount of irrigation water needed to support the landscape. Lawns require a large amount of supplemental water and generally greater maintenance than other vegetation. Use turf where it aesthetically highlights the house or buildings and where it has practical function, such as in play or recreation areas. Grouping turf areas can increase watering efficiency and significantly reduce evaporative and runoff losses. Select a type of grass that can withstand drought periods and become dormant during hot, dry seasons. Reducing or eliminating turf areas altogether further reduces water use.

Efficient irrigation

Efficient irrigation is a very important part of using water efficiently outdoors, and applies in any landscape—whether Xeriscape or conventional. For this reason, an entire section of this booklet addresses efficient irrigation; it can be found on page 6.

Use of mulches

Mulches aid in greater retention of water by minimizing evaporation, reducing weed growth, moderating soil temperatures, and preventing erosion. Organic mulches also improve the condition of your soil as they decompose. Mulches are typically composed of wood bark chips, wood grindings, pine straws, nut shells, small gravel, or shredded landscape clippings. Avoid using rock mulches in sunny areas or around non-arid climate plants, as they radiate large amounts of heat and promote water loss that can lead to scorching. Too much mulch can restrict water flow to plant roots and should be avoided.

Appropriate maintenance

Water and fertilize plants only as needed. Too much water promotes weak growth and increases pruning and mowing requirements. Like any landscape, a water-efficient yard will require regular pruning, weeding, fertilization, pest control, and irrigation. As your water-efficient landscape matures, however, it will require less maintenance and less water. Cutting turf grass only when it reaches two to three inches promotes deeper root growth and a more drought-resistant lawn. As a rule of thumb, mow your turf grass before it requires more than one inch to be removed. The proper cutting height varies, however, with the type of grass, so you should contact your county extension service or local nursery to find out the ideal cutting height for your lawn. Avoid shearing plants or giving them high nitrogen fertilizers during dry periods because these practices encourage water-demanding new growth.

Water-efficient Landscape Irrigation Methods

With common watering practices, a large portion of the water applied to lawns and gardens is not absorbed by the plants. It is lost through evaporation, runoff, or being pushed beyond the root zone because it is applied too quickly or in excess of the plants' needs. The goal of efficient irrigation is to reduce these losses by applying only as much water as is needed to keep your plants healthy. This goal is applicable whether you have a Xeriscape or a conventional landscape.

To promote the strong root growth that supports a plant during drought, water deeply and only when the plant needs water. For clay soils, watering less deeply and more often is recommended. Irrigating with consideration to soil type, the condition of your plants, the season, and weather conditions—rather than on a fixed schedule—significantly increases your watering efficiency. Grouping plants according to similar water needs also makes watering easier and more efficient.

Purple Fountain Grass (Pennisetum setaceum "Rubrum") *and Marigolds* (Calendula officinalis) *in planter bed*

Irrigating lawns, gardens, and landscapes can be accomplished either manually or with an automatic irrigation system. Manual watering with a hand-held hose tends to be the most water-efficient method. According to the AWWA Research Foundation's outdoor end use study, households that manually water with a hose typically use 33 percent less water outdoors than the average household. The study also showed that households with in-ground sprinkler systems used 35 percent more water, those with automatic timers used 47 percent more water, and those with drip irrigation systems used 16 percent more water than households without these types of systems. These results show that in-ground sprinkler and drip irrigation systems must be operated properly to be water-efficient.

You can use a hand-held hose or a sprinkler for manual irrigation. To reduce water losses from evaporation and wind, avoid sprinklers that produce a fine mist or spray high into the air. Soaker hoses can also be very efficient and effective when used properly. Use a hand-held soil moisture probe to determine when irrigation is needed.

To make automatic irrigation systems more efficient, install system controllers such as rain sensors that prevent sprinkler systems from turning on during and immediately after rainfall, or soil moisture sensors that activate sprinklers only when soil moisture levels drop below pre-programmed levels. You can also use a weather-

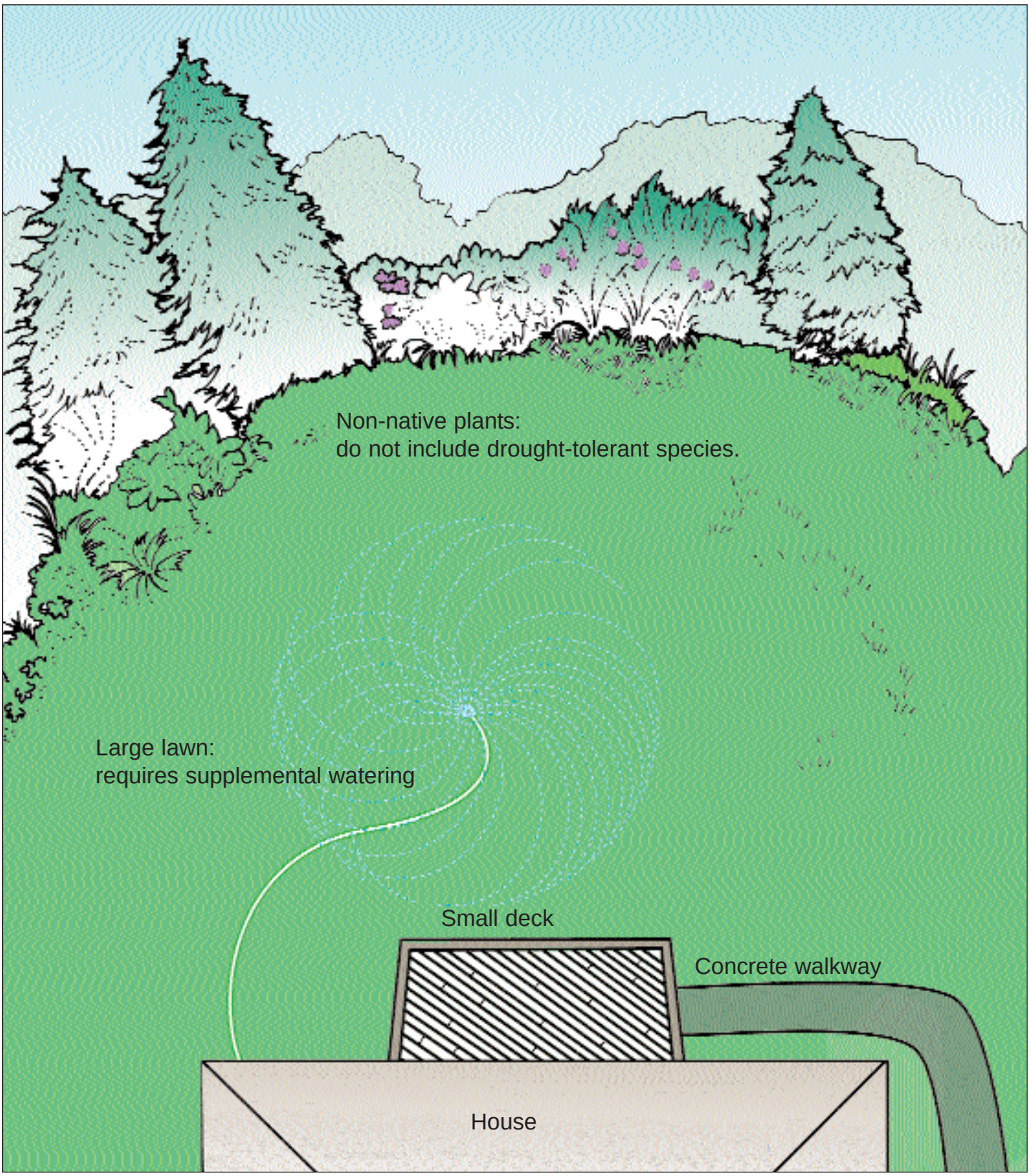
driven programming system. Drip-type irrigation systems are considered the most efficient of the automated irrigation methods because they deliver water directly to the plants' roots. It is also important to revise your watering schedule as the seasons change. Over-watering is most common during the fall when summer irrigation schedules have not been adjusted to the cooler temperatures.

To further reduce your water consumption, consider using alternative sources of irrigation water, such as gray water, reclaimed water, and collected rainwater. According to the AWWA Research Foundation, homes with access to alternative sources of irrigation reduce their water bills by as much as 25 percent.[4] Graywater is untreated household waste water from bathroom sinks, showers, bathtubs, and clothes washing machines. Graywater systems pipe this used water to a storage tank for later outdoor watering use. State and local graywater laws and policies vary, so you should investigate what qualifies as gray water and if any limitations or restrictions apply. Reclaimed water is waste water that has been treated to levels suitable for nonpotable uses. Check with local water officials to determine if it is available in your area. Collected rainwater is rainwater collected in cisterns, barrels, or storage tanks. Commercial rooftop collection systems are available, but simply diverting your downspout into a covered barrel is an easy, low-cost approach. When collecting rainwater, cover all collection vessels to prevent animals and children from entering and to prevent mosquito breeding. Some states might have laws which do not allow collection of rainwater, so be sure to check with your state's water resource agency before implementing a rainwater collection system.

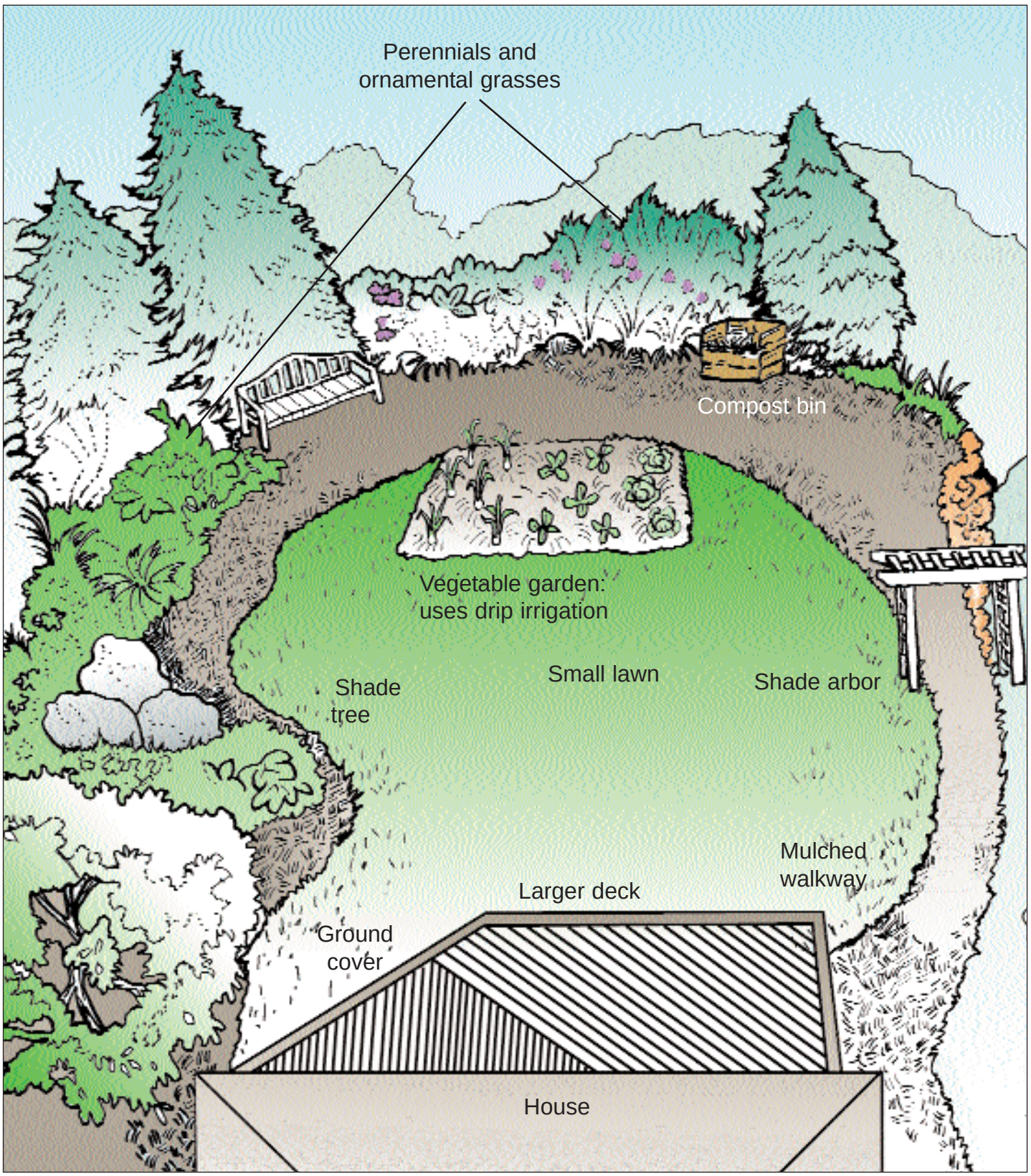
Red Valerian (Centranthus ruber)

4 AWWA Research Foundation. 1999. *Residential End Uses of Water*. <www.waterwiser.org>

Non-xeriscaping



Xeriscaping



Examples of Successful Water-efficient Landscaping Projects

Water-efficient landscaping techniques can be used by individuals, companies, state, tribal, and local governments, and businesses to physically enhance their properties, reduce long-term maintenance costs, and create environmentally conscious landscapes. The following examples illustrate how water-efficient landscapes can be used in various situations.

Oriental Poppies (Paparer orientale)

Homeowner–public/private partnership

- The South Florida Water Management District, the Florida Nurserymen and Growers Association, the Florida Irrigation Society, and local businesses worked together to produce a television video called "Plant It Smart with Xeriscape." The video shows how a typical Florida residential yard can be retrofitted with Xeriscape landscaping to save energy, time, and money. The showcase yard (selected from 70 applicants) had a history of heavy water use—more than 90,000 gallons per month. After the retrofit, the yard's aesthetic value was enhanced; plus it now uses 75 percent less water and relies on yard trimmings for mulch and compost.
- The Southwest Florida Water Management District (SWFWMD), the City of St. Petersburg, and Pinellas County, Florida, produced a video called "Xeriscape It!" It shows a landscape being installed using the seven Xeriscape principles. The SWFWMD also funded several Xeriscape demonstration sites and maintains a Xeriscape demonstration garden at its Brooksville, Florida, headquarters. The garden features a variety of native and non-native plants and is available for public viewing, along with a landscape plant identification guide.
- Residents of Glendale, Arizona, can receive a $100 cash rebate for installing or converting more than half of their landscapable area to non-grass vegetation. The Glendale Water Conservation Office conducts an inspection of the converted lawn to ensure compliance with rebate requirements and then issues a rebate check to the homeowner. The purpose of the Landscape Rebate Program is to permanently reduce the amount of water used to irrigate grass throughout Glendale.

State government

- Although perceived as a water-rich state, Florida became the first to enact a statewide Xeriscape law. Florida's legislature recognized that its growing population and vulnerable environment necessitated legal safeguards for its water resources. The Xeriscape law requires Florida's Departments of Management Ser-

vices and Transportation to use Xeriscape landscaping on all new public properties and to develop a 5-year program to phase in Xeriscape on properties constructed before July 1992. All local governments must also consider requiring the use of Xeriscape and offering incentives to install Xeriscaping.

- Texas also developed legislation requiring Xeriscape landscaping on new construction projects on state property beginning on or after January 1994. Additional legislation, enacted in 1995, requires the Department of Transportation to use Xeriscape practices in the construction and maintenance of roadside parks. All municipalities may consider enacting ordinances requiring Xeriscape to conserve water.

City government

In Las Vegas, Nevada, homeowners can receive up to $1,000 for converting their lawn to Xeriscape, while commercial landowners can receive up to a $50,000 credit on their water bill. The city and several other surrounding communities hope these eye-catching figures will help Las Vegas meet its goal of saving 25 percent of the water it would otherwise have used by the year 2010; to date, it has saved 17 percent. Local officials plan to reach the target with the assistance of incentive programs encouraging Xeriscape, a city ordinance limiting turf to no more than 50 percent of new landscapes, grassroots information programs, and a landscape awards program specifically for Xeriscaped properties. Preliminary results of a five-year study show that residents who converted a portion of their lawns to Xeriscape reduced total water consumption by an average of 33 percent. The xeric vegetation required less than a quarter of the water typically used and one-third the maintenance (both in labor and expenditures) compared to traditional turf.

Yellow Ice Plant (Delosperma nubigenum) *close-up*

Developers

Howard Hughes Properties (HHP), a developer and manager of more than 25,000 acres of residential, commercial, and office development property, has enthusiastically used drought tolerant landscaping on all of its properties since 1990. Most of the company's properties are located in Las Vegas, one of the country's fastest growing metropolitan areas. To conserve resources, the city and county have implemented regulations requiring developers to employ certain Xeriscape principles in new projects. Specifically, a limited percentage of grass can be used on projects, and it must be kept away from streets. As the area's first large-scale developer to recognize the need and value in incorporating drought tolerant landscaping in parks, streetscapes, and open spaces, HHP uses native and desert-adaptive plants that survive and thrive in the Las Vegas climate with minimal to moderate amounts of water.

Drip system irrigation controllers are linked to weather stations that monitor the evapotranspiration rate. This allows HHP to determine the correct amount of water to be applied to plants at any given time. HHP tests the irrigation systems regularly and adds appropriate soil amendments to promote healthy plant growth. The maintenance program also includes pest management, the use of mulching mowers, and the use of rock mulch top dressing on all non-turf planting areas. These measures combine to ensure a beautiful, healthy, and responsible landscape.

Public/private partnerships

Even the most water-conscious homeowners in Southern California are over-watering by 50 to 70 gallons per day. The excess water washes away fertilizers and pesticides, which pollute natural waterways. The quantity of water wasted (and the dollars that pay for it) are even more substantial for large-scale commercial properties and developments.

An innovative partnership in Orange County links landscape water management, green material management, and non-point source pollution prevention goals into one program—the Landscape Performance Certification Program. This program emphasizes efficient landscape irrigation and features a "landscape irrigation budget" based on a property's landscape area, type, and the daily weather. The Municipal Water District monitors actual water use through a system of 12,000 dedicated water meters installed by participating landscape managers.

Participants, including landscapers, property managers, and homeowner associations, can compare the actual cost of water used on their property with the calculated budget. Those staying within budget are awarded certification, a proven marketing tool. This new voluntary program is implemented by the Municipal Water District with input from the California Landscape Contractors' Association, the Orange County Integrated Management Department, the Metropolitan Water District of Southern California, and local nurseries and has the support of 32 retailing water suppliers. The program is already credited with increasing the use of arid-climate shrubs and landscaping to accommodate drip irrigation, and has resulted in cost savings to water customers.

Miscanthus sinensis (Miscanthus grass, also called Maiden grass) *variety with leaves turning yellow for fall.*

For More Information

The following list of organizations can provide more information on water-efficient landscaping. This is not meant to be an exhaustive list, rather it is intended to help you locate local information sources and possible technical assistance.

Turkish Speedwell (Veronica liwanensis) *in background and tulips in foreground.*

Water Management Districts or Utilities

Your local water management district often can provide information on water conservation, including water efficient landscaping practices. Your city, town, or county water management district can be found in the Blue Pages section of your local phone book or through your city, town, or county's Web site if it has one. If you do not know your city, town, or county's Web site, check for a link on your state's Web site. URLs for state Web sites typically follow this format: <www.state.(two letter state abbreviation).us>.

State/County Extension Services

Your state or county extension service is also an excellent source of information. Many extension services provide free publications and advice on home landscaping issues including tips on plant selection and soil improvement. Some also offer a soil analysis service for a nominal fee. Your county extension service can be found in the Blue Pages section of your local phone book under the county government section or through your county's Web site if it has one. The U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (www.reeusda.gov/statepartners/usa.htm) provides an online directory of land-grant universities which can help you locate your state extension service. Government Guide (www.governmentguide.com) is yet another online resource that might prove helpful in locating state or local agencies.

Organizations

The following is a partial list of organizations located across the United States that provide helpful information on water-efficient landscaping.

American Water Works Association (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Telephone: 303 794-7711
and
1401 New York Avenue, NW, Suite 640
Washington, DC 20005
Telephone: 202 628-8303
Web: <www.awwa.org>

Arizona Municipal Water Users Association (AMWUA)
Web: <www.amwua.org/program-xeriscape.htm>

BASIN
City of Boulder Environmental Affairs
P.O. Box 791
Boulder, CO 80306
Phone: 303 441-1964
E-mail: basin@bcn.boulder.co. us
Web: <bcn.boulder.co.us/basin/local/seven.html>

Denver Water
1600 West 12th Avenue
Denver, CO 80204
Phone: 303 628-6000
Fax: 303 628-6199
TDDY: 303 534-4116
Office of Water Conservation hotline:
303 628-6343
E-mail: jane.earle@denverwater.org
Web: <www.water.denver.co.gov/conservation/conservframe.html>

New Mexico Water Conservation Program/Water Conservation Clearinghouse
P. O. Box 25102
Santa Fe, NM 87504
Phone: 800 WATER-NM
E-mail: waternm@ose.state.nm.us
Fax: 505 827-3813
Web: <www.ose.state.nm.us/water-info/conservation/index.html>

Project WET - Water Education for Teachers
201 Culbertson Hall
Montana State University
Bozeman, MT 59717
Phone: 406 994-5392
Web: <www.montana.edu/wwwwet>

Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, CO 81654-9199
Phone: 970 927-3851
Web: <www.rmi.org>

Southern Nevada Water Authority
1001 S. Valley View Boulevard, Mailstop #440
Las Vegas, NV 89153
Phone: 702 258-3930
Web: <www.snwa.com>

Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
Phone: 352 796-7211 or 800 423-1476 (Florida only)
Web: <www.swfwmd.state.fl.us/watercon/xeris/swfxeris.html>

Sustainable Sources Green Building Program: Sustainable Building Source Book
E-mail: info@greenbuilder.com
Web: <www.greenbuilder.com/sourcebook/xeriscape.html>

Water Conservation Garden – San Diego County
12122 Cuyamaca College Drive West
El Cajon, CA 92019
Phone: 619 660-0614
Fax: 619 660-1687
E-mail: info@thegarden.org
Web: <www.thegarden.org/garden/xeriscape/index.html> and <www.sdcwa.org/manage/conservation-xeriscape.phtml>\

WaterWiser: The Water Efficiency Clearing House
(Operated by AWWA in cooperation with the U.S. Bureau of Reclamation)
6666 West Quincy Avenue
Denver, CO 80235
Phone: 800 559-9855
Fax: 303 794-6303
E-mail: bewiser@waterwiser.org
Web: <www.waterwiser.org>

Xeriscape Colorado!, Inc.
P.O. Box 40202
Denver, CO 80204-0202
Web: <www.xeriscape.org>

Resources

The following is a partial list of publications on resource efficient landscaping. For even more information, particularly on plants suited to your locale, consult your local library, county extension service, nursery, garden clubs, or water utility.

Ball, Ken and American Water Works Association Water Conservation Committee. *Xeriscape Programs for Water Utilities*. Denver: American Water Works Association, 1990.

Bennett, Jennifer. *Dry-Land Gardening: A Xeriscaping Guide for Dry-Summer, Cold-Winter Climates*. Buffalo: Firefly, 1998.

Bennett, Richard E. and Michael S. Hazinski. *Water-Efficient Landscape Guidelines*. Denver: American Water Works Association, 1993.

Brenzel, Kathleen N., ed. *Western Garden Book*, 2001 Edition. Menlo Park: Sunset Publishing Corporation, 2001.

City of Aurora, Colorado Utilities Department. *Landscaping for Water Conservation: Xeriscape!* Aurora: Colorado Utilities Department, 1989.

Johnson, Eric and Scott Millard. *The Low-Water Flower Gardener: 270 Unthirsty Plants for Color, Including Perennials, Ground Covers, Grasses & Shrubs*. Tucson: Ironwood Press, 1993.

Knopf, James M. *The Xeriscape Flower Gardener*. Boulder: Johnson Books, 1991.

Knopf, James M., ed. *Waterwise Landscaping with Trees, Shrubs, and Vines: A Xeriscape Guide for the Rocky Mountain Region, California, and the Desert Southwest*. Boulder: Chamisa Books, 1999.

Knox, Kim, ed. *Landscaping for Water Conservation: Xeriscape*. Denver: City of Aurora and Denver Water, 1989.

Nellis, David W. *Seashore Plants of South Florida and the Caribbean: A Guide to Identification and Propagation of Xeriscape Plants*. Sarasota: Pineapple Press, Inc., 1994.

Perry, Bob. *Landscape Plants for Western Regions: An Illustrated Guide to Plants for Water Conservation*. Claremont: Land Design Publishing, 1992.

Phillips, Judith. *Natural by Design: Beauty and Balance in Southwest Gardens*. Santa Fe: Museum of New Mexico Press, 1995.

Phillips, Judith. *Plants for Natural Gardens: Southwestern Native & Adaptive Trees, Shrubs, Wildflowers & Grasses*. Santa Fe: Museum of New Mexico Press, 1995.

Robinette, Gary O. *Water Conservation in Landscape Design and Maintenance*. New York: Nostrand Reinhold, 1984.

Rumary, Mark. *The Dry Garden*. New York: Sterling Publishing Co., Inc., 1995.

Springer, Lauren. *The Undaunted Garden: Planting for Weather-Resilient Beauty*. Golden: Fulcrum Publishing, 1994.

Springer, Lauren. *Waterwise Gardening*. New York: Prentice Hall Gardening, 1994.

Stephens, Tom, Doug Welsh, and Connie Ellefson. *Xeriscape Gardening, Water Conservation for the American Landscape*. New York: Macmillan Publishing, 1992.

Sunset Books, eds. *Waterwise Gardening: Beautiful Gardens with Less Water*. Menlo Park: Lane Publishing Company, 1989.

Vickers, Amy. *Handbook of Water Use and Conservation*. Amherst, MA: WaterPlow Press, 2001.

Weinstein, Gayle. *Xeriscape Handbook : A How-To Guide to Natural, Resource-Wise Gardening*. Golden: Fulcrum Publishing, 1998.

Williams, Sara. *Creating the Prairie Xeriscape*. Saskatchewan: University Extension Press, 1997.

Winger, David, ed. *Xeriscape Plant Guide: 100 Water-Wise Plants for Gardens and Landscapes*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Xeriscape Color Guide*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Evidence of Care: The Xeriscape Maintenance Journal, 2002, Vol. 1*, Colorado WaterWise Council, 2001.

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For copies of this publication contact:
EPA Water Resources Center (RC-4100)
U.S. Environmental Protection Agency
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.
Washington, DC 20460

For more information regarding water efficiency, please contact:
Water Efficiency Program (4204M)
U.S. Environmental Protection Agency
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.
Washington, DC 20460
<www.epa.gov/OWM/water-efficiency/index.htm>

United States
Environmental Protection Agency (4204M)
Washington, DC 20460

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CHAPTER 19.70

LANDSCAPING

Section:

19.70.010 INTENT AND PURPOSE

A. Determinations

The City Council has determined the following:

1. Water is a valuable resource in limited supply in the State subject to increasing demand.
2. The City has set the goal of implementing measurements resulting in the more efficient use of water through landscaping and irrigation design.
3. Landscapes provide recreation areas, promote clean air and water, prevent erosion, and replace ecosystems displaced by development.
4. Landscape design, installation and maintenance shall be water- efficient.

B. Purpose

The purpose of this Chapter shall be to:

1. Promote the values and benefits of landscapes while recognizing the need to use water as efficiently as possible.
2. Establish criteria for designing, installing, and maintaining water-efficient landscapes in new projects.
3. Establish landscape design criteria for development projects.

19.70.020 DEFINITIONS

The following terms used in this Ordinance have the meaning set forth below:

"Application rate" means the amount of water applied to an area in one (1) hour measured in inches per hour.

"Backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

"Check valve" or "anti-drain valve" means a valve located under a sprinkler head or other location in the irrigation system to hold water in the system to prevent drainage from the sprinkler heads when the system is off.

"Conversion factor (0.62)" means a number that converts the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows:

(325,829 gallons/43,560 square feet)/

12 inches = (0.62)

325,829 gallons = one acre foot

43,560 square feet = one acre

To convert gallons per year to 100-cubic feet per year (a common billing unit for water), divide gallons per year by 748 (748 gallons = 100 cubic feet).

"Emitter" means a drip irrigation fitting that delivers water slowly from the system to the soil.

"Established landscape" means the point at which plants in the landscape have developed significant root growth into the site. Typically, most plants are established after one or two years of growth.

"Establishment period" means the first year after installing the plant in the landscape.

"Estimated Annual Water Use" (EAWU) means the portion of the Estimated Total Water Use that is derived from applied water. The Estimated Annual Water Use shall not exceed the Maximum Applied Water Allowance (MAWA). Estimated Annual Water Use may be the sum of the water used on system components recommended through the irrigation schedule. EAWU is used to estimate the total water use per year for a given hydrozone, and is calculated as follows:

EAWU (in gallons) = (ETo)(0.62)[((PFxHA)/IE) +SLA]

where:
ETo is reference evapotranspiration (56.65 is a recent ETo rate for Perris)
PF is Plant Factor
HA is hydrozone area in square feet
IE is irrigation efficiency (minimum 0.71)
SLA is the amount of special landscape area in square feet

"Evapotranspiration" (ETo) or "Reference Evapotranspiration" means the quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time. "ETo" is a standard measure of environmental parameters that affect the water use of plants. ETo is given in inches per day, month or year. ETo is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well-watered. Reference evapotranspiration is used as

the basis of determining the Maximum Applied Water Allowance (MAWA) so that regional differences in climate can be accommodated. A recent annual ETo determined for Perris is 56.65.

"Flow rate" means the rate at which water flows through pipes and valves (gallons per minute or cubic feet per second).

"Hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

"Invasive species" are non-indigenous species (e.g., plants or animals) that adversely affect the habitats they invade economically, environmentally, or ecologically. Lists of invasive species are included within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (incorporated by reference).

"Landscape architect" means a person who holds a license to practice landscape architecture in the State of California (Government Code Section 5615).

"Landscaped area" or "LA" means all of the planting areas, turf areas and water features in a landscape design plan subject to the Maximum Applied Water Allowance (MAWA) calculation. Landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or impervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

"Landscape Plans" for the purpose of meeting the requirements of this Ordinance shall include the following items: Planting Plan, Irrigation Plan, Soil Management Plan, and Grading Plan. A submittal package missing any one of these items will be deemed incomplete.

"Low volume irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

"Maximum Applied Water Allowance" or "MAWA" means the upper limit of annual applied water allowed for the established landscaped area, and is calculated as follows:

- For landscapes installed before January 1, 2010, the applicable MAWA (in gallons)=
  (ETo)(0.62)(**0.8**)(LA)

- For landscapes installed after January 1, 2010, the applicable MAWA (in gallons)=
  (ETo)(0.62)[**0.7** xLA+0.3 x SLA]

  where:
  ETo is reference evapotranspiration
  SLA is the amount of special landscape area in square feet
  LA is total landscape area (including the SLA) in square feet

MAWA (in gallons) = (ETo)(0.62)[0.7 x LA+0.3 x SLA]

For the purposes of determining the Maximum Applied Water Allowance (MAWA), average irrigation efficiency is assumed to be 0.71. New irrigation systems shall be designed, maintained, and managed to meet or exceed an average irrigation efficiency of 0.71.

"Overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., pop- ups, impulse sprinklers, spray heads and rotors, etc.).

"Rehabilitated landscapes" means any re-landscaping project that requires a permit, plan check, or design review, and/or would meet the requirements of 19.70.030.B.

"Special landscape area" (SLA) means an area of the landscape dedicated to edible plants, areas irrigated with recycled water, and publicly accessible areas dedicated to active play such as parks, sports fields, golf courses, where turf provides a playing field or where turf is needed for high traffic activities.

"Temporarily irrigated" means irrigation for the purposes of establishing plants, or irrigation which will not continue after plant establishment. Temporary irrigation is for a period of six months or less.

"Water intensive landscaping" means a landscape with a WUCOLS plant factor of 0.7 or greater.

"Water Service Area" means an area where retail water services are provided by a local water purveyor. The water purveyor provides metering services, water use billing and shall be responsible for enforcement of this Ordinance. The City of Perris has three water service areas, two of its own, and the area encompassed by the Eastern Municipal Water District (EMWD).

"WUCOLS" means the publication entitled "Water Use Classification of Landscape Species" by the U.C. Cooperative Extension (1999 or most current version).

19.70.030 WATER CONSERVATION REQUIREMENTS FOR NEW OR REHABILITATED LANDSCAPES

A. ***Intent.*** By adoption of these provisions, it is the intent of this Ordinance to:

1. Establish provisions for water management practices and water waste prevention;
2. Establish a structure for planning, designing, installing, maintaining, and managing water efficient landscapes in new construction and rehabilitated projects;
3. To reduce the water demands from landscapes without a decline in landscape quality or quantity;
4. To retain flexibility and encourage creativity through appropriate design;
5. To attain water-efficient landscape goals by requiring that landscapes not exceed a maximum water demand of 70% of its reference evapotranspiration (ET_o) rate;
6. To eliminate water waste from overspray and/or runoff;

7. To achieve water conservation by raising the public awareness of the need to conserve water through education and motivation to embrace an effective water demand management program; and
8. To implement the requirements to meet the state of California Water Conservation in Landscaping Act 2006 and the California Code of Regulations Title 23, Division 2, Chapter 2.7.

B. ***Applicability.*** The City of Perris has two water service areas, its own and the area encompassed by the Eastern Municipal Water District (EMWD). Water-efficiency standards for landscaping shall apply as follows:

1. **New or rehabilitated landscape projects** throughout the City (City water service areas or EMWD service areas) are subject to the water-efficiency requirements of this Ordinance as follows:
    a. All new construction landscapes which are homeowner-provided and/or homeowner-hired ("owner-builder") in single-family and multi-family projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or design review as determined by the Director of Development Services;
    b. All other landscape projects with a landscape area equal to or greater than 2,500 square feet subject to discretionary permits, plan checks, design reviews, and/or approvals as determined by the Director of Development Services.

2. **Existing properties with landscape areas within the Perris water service area** are subject to the water-efficiency requirements of this Ordinance when:
    a. Properties with landscape areas are one acre or greater in size, or
    b. Properties less than one acre in size are served by a dedicated landscape irrigation meter.
    c. Existing properties with landscape areas installed before January 1, 2010 that are less than one acre in size, or not served by a dedicated landscape irrigation meter, are limited to an ETo factor of 0.8, and subject to water conservation enforcement by the water service provider.

3. **Existing properties with landscape areas within the EMWD water service area** are subject to the water-efficiency requirements of this Ordinance and the terms of EMWD's water service agreement, including but not limited to, tiered rate pricing, any Water Shortage Contingency Plan, Water Use Efficiency Ordinance 72.24, and enforcement thereof. Landscapes installed before January 1, 2010 are limited to an ETo factor of 0.8.

C. ***CC&Rs.*** When Covenants, Conditions and Restrictions (CC&Rs) are required for any permit subject to this Ordinance, a Condition of Approval shall state the following:

1. The CC&R's shall prohibit water-intensive landscaping and require low water use landscaping pursuant to the provisions of this Ordinance in connection with common area/open space landscaping. The CC&Rs shall not prohibit use of low-water use plants, nor prohibit the replacement of turf with less water intensive plant species.

2. The CC&R's shall incorporate provisions addressing landscape irrigation system management and maintenance.
3. The Ordinance shall not apply to common areas or open space that is intended to remain natural.

D. ***Cemeteries.*** Cemeteries are recognized as having unique landscape needs. New, rehabilitated and existing cemeteries are required to comply with the landscape and maintenance protocol described in 19.70.050, if not a registered local, state or federal historical site.

E. ***Exemptions.*** The following projects or sites are exempt from the provisions of this chapter:

1. Any project with a total landscaped area less than 2,500 square feet.
2. Registered local, state or federal historical sites.
3. Ecological restoration projects that do not require a permanent irrigation system and have an establishment period of less than 3 years.
4. Mined-land reclamation projects that do not require a permanent irrigation system.
5. Botanical gardens and arboretums open to the public.

F. ***Special Landscape Areas (SLA)***. The following specialized landscape areas are allowed an ET0 factor of 0.8 when calculating MAWA:

1. Publicly accessible recreation areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing field;
2. Areas irrigated with recycled water;
3. Areas devoted to edible plants;
4. Where turf is needed for high traffic activities.

19.70.040 LANDSCAPE PLAN CHECK REQUIREMENTS

A. ***Landscape Plan Requirements***

1. An applicant proposing any new or rehabilitated landscape subject to this Ordinance shall prepare and submit complete landscape plans to the Development Services Department for review and approval. No building permit shall be issued until the plans have been reviewed and approved by the Development Services Department.
2. A copy of the approved landscaping and irrigation plans shall be provided to the applicant and the licensed landscape architect who prepared and stamped the plans.
3. Conceptual landscaping plans shall be submitted for review and preliminary approval with applications for administrative development plan review, development plan review, conditional use permit, specific plan, and other applications as determined by the Development Services Director. Conceptual landscape plans shall include the following information at minimum:
    a. Planting plan.
    b. Plant palette.

c. Water use estimates.
d. Allowed water circulation.

4. The final landscape and irrigation plans shall be stamped by a California licensed landscape architect and shall include at a minimum the following:
    a. Landscape design plan.
    b. Irrigation design plan.
    c. Water Quality Management Plan (WQMP) site design BMP's
    d. Planting details (per the City's Technical Manual for Landscape Design), including but not limited to:
        i. Tree staking (double-staked)
        ii. Groundcover spacing
        iii. Planting specifications (trees and shrubs)
        iv. Root barriers as necessary
    e. Maintenance schedule.
    f. Approval block for City signatures.

B. ***Required Landscape Plan Project Information***

1. Date.
2. Applicant name and contact information.
3. Project owner and contact information.
4. Project address including parcel and lot numbers.
5. Site information required by Chapter 19.71, Urban Forestry.
6. Total landscape area in square feet.
7. Project type (e.g., new, rehabilitated, public, private).
8. Water supply (e.g., potable, well, recycled). Use of recycled water is encouraged.
9. Applicant signature and date with statement "I agree to comply all requirements of this Ordinance and submit complete Landscape Plans."

C. ***Planting Plan Requirements***

1. The City's Technical Manual for Landscape Design (19.70 Appendix) shall be referenced for Water Use Classifications of Landscape Species (WUCOLS) list, approved City of Perris Street Tree List, and landscape design details.
2. The "Riverside County Guide to California Friendly Landscaping" is hereby incorporated by reference to assist with developing water efficient landscapes.
3. Plants shall be selected appropriately based upon their adaptability to the climate, geologic and topographical conditions on the project site.
4. Plant types shall be grouped together according to their water, soil, sun and shade requirements, and relationship to buildings and available shade. Plants with different water needs shall be irrigated separately. Plants with the following classifications shall be grouped accordingly: high and moderate, moderate and low, low and very low. Deviation from these groupings shall not be permitted.
5. Designation of any Special Landscape Area dedicated to recreation and publicly accessible areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing field; areas irrigated with recycled water; areas devoted to edible plants; or where turf is needed for high traffic activities.

6. Water features and pool regulations:
    a. Decorative water features shall use re-circulating water systems.
    b. Commercial/community-oriented facilities with pools and/or spas shall be equipped with covers to minimize evaporation when not in use.
    c. Where available, recycled water shall be used as the source for irrigation and decorative water features.
7. Areas to be accepted for maintenance by the City shall be clearly indicated by a concrete mow strip, wall or other element easily distinguished from adjacent landscaping. A concrete mow strip shall separate turf from other planting areas.
8. Trees are an essential element of landscape design and their inclusion shall be carefully considered and optimized. As opportunity permits, trees shall be planted to increase the urban canopy, cleanse the air, reduce the heat island effect and conserve energy. Trees for shade (deciduous and/or evergreen) shall be provided per Chapter 19.71, Urban Forestry, for residential, commercial and industrial building sites, parking lots and in open space areas to maximize energy and water conservation.
9. Plants shall be placed in a manner considerate of solar orientation to maximize summer shade and winter solar gain.
10. Plant selection for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Fire-prone plant materials and highly flammable mulches shall be avoided.
11. Protection and preservation of native species and natural areas is encouraged.
12. Invasive species of plants shall be avoided especially near parks, buffers, greenbelts, water bodies, and open spaces because of their potential to cause harm in to environmentally sensitive areas.
13. Exposed surfaces of non-turf areas within the developed landscape area shall be mulched with a minimum three inch (3") layer of organic material, except in areas with groundcover planted from flats where mulch depth shall be two inches (2").
14. Stabilizing organic mulching products shall be used on slopes.
15. Turf areas shall be used in response to functional needs and in compliance with the water budget.
16. Planting plans shall identify and site the following:
    a. New and existing trees, shrubs, groundcovers, and turf areas within the proposed landscape area;
    b. Planting legend indicating all plant species by botanical name and common name, spacing, and quantities of each type of plant by container size;
    c. Designation of hydrozones;
    d. Area, in square feet, devoted to landscaping with a breakdown of the total area by landscape hydrozones;
    e. Property lines, streets, and street names;
    f. Building locations, driveways, sidewalks, retaining walls, and other hardscape features;
    g. Appropriate scale and north arrow;
    h. Any special landscape areas;
    i. Type of mulch and application depth;
    j. Type and surface area of any water features;

k. Type and installation details of any applicable stormwater best management practices;
l. Planting specifications and details, including the recommendations from the soils analysis as applicable.

17. Planting plans shall be prepared using the following Maximum Applied Water Allowance (MAWA):

MAWA (in gallons) = (ETo)(0.62)[0.7 x LA+0.3 x SLA]

where:
ETo is reference evapotranspiration
SLA is the amount of special landscape area in square feet
LA is total landscape area (including the SLA) in square feet

For the purposes of determining the Maximum Applied Water Allowance (MAWA), average irrigation efficiency is assumed to be 0.71. New irrigation systems shall be designed, maintained, and managed to meet or exceed an average irrigation efficiency of 0.71.

18. Hydrozones shall be calculated according to Estimated Annual Water Use (EAWU). The EAWU for a given hydrozone is calculated as follows:

EAWU (in gallons) = (ETo)(0.62)[((PFxHA)/IE) +SLA]

where:
ETo is reference evapotranspiration (56.65 is the evapotranspiration rate for Perris, as measured in inches of water per year)
PF is Plant Factor
HA is hydrozone area in square feet
IE is irrigation efficiency (minimum 0.71)
SLA is the amount of special landscape area in square feet

a. Landscaping plans shall provide EAWU in the same units as the MAWA for each valve circuit in the irrigation hydrozone. The sum of all EAWU calculations shall not exceed the MAWA for the project.
b. The plant factor used shall be from WUCOLS. The plant factor for low water use plants range from 0 to 0.3, for moderate water use plants range from 0.4 to 0.6, and for high water use plants range from 0.7 to 1.0.
c. The plant factor calculation is based on the proportions of the respective plant water uses and their plant factor, or the plant factor of the higher water using plant is used.
d. The surface area of a water features shall be included in the high water use hydrozone area of the water budget calculation and temporarily irrigated areas in the low water use hydrozone.

19. Reference is made to the Technical Manual for Landscape Design for the (PF) value of a specific plant; the irrigation efficiency (IE) value for the various types of irrigation

heads or emitters; the AE value of a control system; and, other supplementary details on conforming to requirements that are a part of this Ordinance.

20. Planting and irrigation plans shall be drawn at the same size and scale.
21. Planting and irrigation plans shall be prepared by a landscape architect licensed by the State of California.

D. ***Irrigation Design Plan Requirements***

1. The "Riverside County Guide to California Friendly Landscaping" (Guide) is hereby incorporated by reference to assist the applicant in designing, constructing, and maintaining an efficient irrigation system.
2. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average irrigation efficiency of 0.71.
3. The applicant/developer for a project in the Eastern Municipal Water District (EMWD) shall contact EMWD prior to irrigation system design to determine the availability of recycled water or potable water service. If EMWD determines that potential service will be furnished with recycled water, the landscape and irrigation plans shall be designed in accordance with EMWD requirements for recycled water systems.
4. All irrigation systems shall be designed to prevent runoff, over-spray, low-head drainage and other similar conditions where water flows off site onto adjacent property, non-irrigated areas, walk, roadways, or structures. Irrigation systems shall be designed, constructed, managed, and maintained to achieve as high an overall efficiency as possible. The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
5. Landscaped areas shall be provided with a smart irrigation controller which automatically adjusts the frequency and/or duration of irrigation events in response to changing weather conditions, unless the use of the property would otherwise prohibit use of a timer.
6. Water systems for common open space areas shall use non-potable water, if approved facilities are made available by the water purveyor. Provisions for the conversion to a non-potable water system shall be provided within the landscape plan. Water systems designed to utilize non-potable water shall be designed to meet all applicable standards of the California Regional Water Quality Control Board, the Riverside County Health Department and EMWD.
7. Separate valves shall be provided for separate water use planting areas so that plants with similar water needs are irrigated by the same irrigation valve. All installations shall rely on highly efficient state of the art irrigation systems to eliminate runoff and maximize irrigation efficiency.
8. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at the installation.
9. The capacity of the irrigation system shall not exceed:
   a. The capacity required for peak water demand based on water budget calculations;
   b. meter capacity; or
   c. backflow preventer type and device capacity.

10. Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer.
11. In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
12. Non-turf areas on slopes greater than 25% shall be irrigated with drip irrigation or other low volume irrigation technology.
13. Long, narrow, or irregularly shaped areas including turf less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or low-volume irrigation technology.
14. Overhead irrigation shall not be permitted within 24 inches of any nonpermeable surface. There are no restrictions on the irrigation system type if the landscape area is adjacent to permeable surfacing and no overspray and runoff occurs.
15. Overhead irrigation shall be limited to the hours of 8 p.m. to 9 a.m.
16. All irrigation systems shall be equipped with the following:
    a. A smart irrigation controller as defined in Section 19.70.040.D.5 of this Ordinance;
    b. A rain-sensing device to prevent irrigation during rainy weather;
    c. Anti-drain check valves installed at strategic points to minimize or prevent low-head drainage;
    d. A manual shut-off valve shall be required as close as possible to the point of connection of the water supply to minimize water loss in case of an emergency or routine repair;
    e. A pressure regulator when the static water pressure is above or below the recommended operating pressure of the irrigation system;
    f. Backflow prevention devices; and
    g. Riser protection components for all risers in high traffic areas.
17. Dedicated landscape meters shall be required for all projects greater than 2,500 sq. ft.
18. Irrigation Plans shall identify and site the following:
    a. Hydrozones
        i) Each hydrozone shall be designated by number, letter or other designation
        ii) A Hydrozone Information Table shall be prepared for each hydrozone
    b. The areas irrigated by each valve;
    c. Irrigation point of connection (POC) to the water system;
    d. Static water pressure at POC;
    e. Location and size of water meter(s), service laterals, and backflow preventers;
    f. Location, size, and type of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads and nozzles, pressure regulator, drip and low volume irrigation equipment;
    g. Total flow rate (gallons per minute), design operating pressure (psi) for each overhead spray and bubbler circuit, and total flow rate (gallons per hour) and design operating pressure (psi) for each drip and low volume irrigation circuit;
    h. Precipitation rate (inches per hour) for each overhead spray circuit;
    i. Irrigation legend with the manufacturer name, model number, and general description for all specified equipment, separate symbols for all irrigation equipment with different spray patterns, spray radius, and precipitation rate;
    j. Irrigation system details for assembly and installation;
    k. Recommended irrigation schedule for each month, including number of irrigation days per week, number of start times (cycles) per day, minutes of run time per

cycle, and estimated amount of applied irrigation water, expressed in gallons per month and gallons per year, for the established landscape; and

l. Irrigation Plans shall contain the following statement, "I agree to comply with the criteria of the Ordinance and to apply them for the efficient use of water in the Irrigation Design Plan."

19. For each valve, two irrigation schedules shall be prepared identifying the specific water needs of the plants and turf throughout the calendar year: one for the initial establishment period of six months, and one for the established landscape.
20. Irrigation Plans and Planting Plans (19.70.040.C and D) shall be drawn at the same size and scale.
21. Whenever possible, irrigation scheduling shall incorporate evapotranspiration (ETo) data from the California Irrigation Management Information System (CIMIS) weather stations to determine the appropriate levels of water application for this climate. A local weather station is located at UC Riverside. (wwwcimis.water.ca.gov/)
22. Irrigation system for areas to be accepted for maintenance by the City shall have a centralized control system or controllers that can be programmed and that measure soil moisture and evapotranspiration rates associated with centrally controlled systems.

E. Soil Management Plan Requirements

1. After mass grading, the project applicant or his/her designee shall:
   a. Perform a preliminary site inspection;
   b. Determine the appropriate level of soil sampling and sampling method needed to obtain representative soil sample(s);
   c. Conduct a soil probe test to determine if the soil in the landscape area has sufficient depth to support the intended plants; and
   d. Obtain appropriate soil sample(s).
2. The project applicant or his/her designee shall submit soil sample(s) to laboratory for analysis and recommendation. The soil analysis may include:
   a. Soil texture;
   b. Infiltration rate determined by laboratory test or soil texture infiltration rate tables;
   c. pH;
   d. Total soluble salts;
   e. Sodium; and
   f. Recommendations.
3. The project applicant or his/her designee shall prepare documentation describing the following:
   a. Soil type;
   b. Identification of limiting soil characteristics;
   c. Identification of planned soil management actions to remediate limiting soil characteristics; and
4. The soil analysis report and documentation verifying implementation of soil analysis report recommendations shall be submitted to the City of Perris pursuant to the requirements of 19.70.040.H.3, Certificate of Completion.

F. ***Grading Design Plan Requirements, as applicable***

1. The Landscape Plans shall include rough/precise grade elevations prepared for the project by a licensed civil engineer.
2. Rough grading plans shall include Water Quality Management Plan (WQMP) BMPs such as basins, swales, and permeable surfaces other than green landscape.

G. ***Landscape Irrigation and Maintenance***

This section applies to all landscape projects subject to this Ordinance. The "Riverside County Guide to California Friendly Landscaping" (Guide) is hereby incorporated by reference to promote water use efficiency.

1. Two irrigation schedules shall be prepared: one for the initial establishment period of six months, and one for the established landscape, which incorporates the specific water needs of the plants and turf throughout the calendar year. The irrigation schedule shall take into account the particular characteristics of the soil; shall be continuously available on site to those responsible for the landscape maintenance; and shall contain specifics as to optimum run time and frequency of watering, and irrigation hours per day. The schedule currently in effect shall be posted at the controller.
2. A regular maintenance schedule shall be submitted to the Development Services Director, property owner, and water purveyor, with the Certificate of Completion (19.70.040.H.3). A regular maintenance schedule shall include, but not be limited to, routine inspection, adjustments, and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning, weeding in all landscape areas and removing any obstruction to irrigation devices.
3. Repair of all irrigation equipment shall be done with the originally installed components or equivalent.
4. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this Ordinance.
5. Information shall be provided to owners of new, single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes.

H. Landscape Plan Check Process

1. As part of the land development process and prior to construction, the City shall:
   a. Provide the project applicant with the Ordinance and procedures for permits, plan checks, or design reviews;
   b. Review the Landscape Plans submitted by the project applicant;
   c. Approve or reject the Landscape Plans; and
   d. Issue a permit or approve the plan check or design review for the project applicant.
2. For all landscape projects subject to this Ordinance, the project applicant shall submit complete Landscape Plans prior to construction for review and approval by the Director of Development Services. Planting Plans, Irrigation Plans, Soils Management Plans and Grading Plans shall be reviewed to ensure that all components adhere to the requirements of this Ordinance. A licensed landscape architect shall sign to verify the

Plans comply with this Ordinance. Any Plans submitted without the appropriate signature shall not be accepted for review.

3. A Certificate of Completion shall be completed and signed by a licensed landscape architect prior to issuance of a Certificate of Occupancy or final inspection for a project subject to this Ordinance. The Certificate of Completion and a regular maintenance schedule shall be submitted to the Development Services Director certifying that the landscaping has been completed in accordance with the approved Landscape plans (Planting, Irrigation, Soil Management, and Grading Design) for the project. The Certificate of Completion shall contain the following information:
   a. Date
   b. Project information
   c. Project name
   d. Project applicant name, telephone, mailing address
   e. Project address and location
   d. Property owner name and mailing address
   e. Prior to backfilling, evidence that the party responsible for irrigation installation conducted a preliminary field inspection of the irrigation system (evidence of field inspection shall be attached).
   f. The landscaping has been installed in conformance with the approved Planting and Irrigation plans;
   g. Irrigation audit report performed by a certified irrigation auditor after project installation (audit report shall be attached);
   h. The smart irrigation controller has been set according to the irrigation schedule;
   i. The irrigation system has been adjusted to maximize irrigation efficiency and eliminate overspray and runoff; and
   j. Verification that a copy of the approved complete Landscape plans, irrigation schedule, and maintenance schedule has been provided to the property owner and the local water purveyor (either EMWD or City).
   k. Verification that the maintenance schedule has been provided to the Development Services Director.
4. At minimum, all landscape irrigation audits shall comply with the "Irrigation Association Certified Landscape Irrigation Auditor Training Manual" (2004 or most current) and shall be conducted by a certified landscape irrigation auditor.
5. The Development Services Director or his/her designee shall have the right to enter upon the project site at any time before, during and after installation of the landscaping, to conduct inspections for the purpose of enforcing this Ordinance.

19.70.50 LANDSCAPE WATER USE EFFICIENCY MEASURES

A. ***Restrictions.*** The following water conservation measures are intended to avoid water waste, are effective at all times, and are permanent.

1. **Limits on Watering Hours:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 9:00 a.m. and 5:00 p.m. on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very

short periods of time for the express purpose of adjusting or repairing an irrigation system. Overhead irrigation shall be limited to the hours of 8 pm to 9 am.

2. **No Excessive Water Flow or Runoff:** Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.
3. **No Washing Down Hard or Paved Surfaces:** Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device, a low-volume, high-pressure cleaning machine equipped to recycle any water used, or a low-volume high pressure water broom.
4. **Obligation to Fix Leaks, Breaks or Malfunctions:** Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than seven (7) days, is prohibited.

B. ***Landscape Meter Requirements***

1. A separate dedicated meter is required for new landscape areas greater than or equal to 2,500 square feet.
2. The efficient use of water shall be considered in the design of any new landscape area. The MAWA will be calculated for customers that request a new account using the formula in 19.70.040.C of this Ordinance.
3. Prior to the issuance of a meter, the new customer shall calculate the EAWU for each landscape area using the formula provided in 19.70.040.C. For the new meter to be issued, the EAWU shall be reviewed by the local water purveyor to insure the water budget for the landscape area does exceed the MAWA calculated under this Ordinance.
4. New accounts that must comply with equivalent or more stringent water use efficiency measures imposed by another jurisdiction (State of California, public utility companies, etc.), do not need to comply with the requirements of this section of the Ordinance, but may need to provide information about the landscape area to the local water purveyor.

C. ***Enforcement.*** Water waste resulting from inefficient landscape irrigation shall be prohibited. The City of Perris employs random irrigation audits and/or irrigation surveys to insure the landscape area meets the applicable MAWA to ensure water is being used efficiently in its water service areas. Within the EMWD water service area, existing landscaped properties are subject to EMWD's tiered rate water budget and water conservation enforcement procedures.

1. Existing landscapes including green belts, common areas, multi-family housing, schools, businesses, parks, cemeteries, and publicity owned landscapes are subject to review of water usage. For landscapes installed before January 1, 2010, the applicable MAWA (in gallons) = (ETo)(0.62)(0.8)(LA).
    a. If water bills indicate that the facility is using less than or equal to the maximum applied water allowance for that project site, no action is necessary.

b. If water bills indicate that the facility is using more water than the maximum applied water allowance, the irrigation system shall be reviewed and fine tuned to the greatest extent feasible to increase efficiency of the system.

2. Within both the City of Perris and EMWD water service areas warnings, correction notices (Notice of Violation), citations and/or penalties (including fees) may be issued for any violation of this Ordinance.

19.70.060 LANDSCAPE DESIGN GUIDELINES

This Section shall serve as a guideline only, and additional requirements may be appropriate for special or unique projects, or as determined by the Director of Development Services. Reference is made to Chapter 19.71, Urban Forestry, and the Technical Manual for Landscape Design for supplementary details on conforming to requirements of this Ordinance.

A. ***Street Tree Requirements.*** Street trees shall be incorporated along all street right-of-way and shall be provided to the following specifications:

1. General:
   a. Type of street trees should be consistent with existing street trees.
   b. Trees with fruit, nuts, pepper, or other maintenance intensive characteristics are not encouraged for use as street trees.
2. Commercial, Industrial, Multi-Family Residential, Parks and Public Facilities..
   a. A minimum of one tree per 30 feet of lineal frontage. In order to enhance design, trees may be placed in groupings; however the number of trees provided shall be derived as stated above.
   b. The minimum size for the street trees shall be 24 inch box.
   c. Lineal root barriers shall be installed for any street tree which is planted within 5 feet of public right-of-way or sidewalk.
3. Single-Family Residential.
   a. Standard lots shall have a minimum of one (1) tree per 30 lineal street frontage, however, each lot shall have a minimum of one street tree per lot (cul-de-sac lots).
   b. Corner lots shall have three (3) street trees, minimum or one (1) street tree for every 30 lineal feet of street frontage.
   c. Corner lot side yard planting areas between fences/walls and side walks shall be planted with 5 gallon shrubs at spacing no greater than 5'-0" o.c. to achieve a 80 % shrub cover in 5 years and one (1) gallon groundcover at not more than 24" o.c. One (1) gallon vines shall be placed at 20'-0"o.c.
   d. The minimum size for the street trees shall be 24 inch box.
   e. Lineal root barriers shall be installed for any street trees planted within 5'-0" or closer to hardscape or walks.

B. ***Median & Parkway Requirements***

1. In accordance with the Circulation Element of the General Plan, medians shall be installed along Expressways, Primary Arterials, Secondary and may be required for other significant roadways, including those within specific plans. The requirement for

median treatments along other roadways will be dependent upon traffic control needs, and if required, shall be landscaped according to these guidelines.

2. The design of the median shall be consistent for each street and comply with the following guidelines:
   a. Turf treatment shall be minimized.
   b. Water runoff into the street shall not occur,
   c. Trees, shrubs, and groundcover shall be incorporated.
   d. Shrub placement shall be designed to form natural groupings that will not require excessive pruning or hedging, with varying heights, to create a multi-tiered effect. Shrubs shall be spaced to provide 80% coverage of planting area within five (5) years of installation.
   e. Shrubs within medians shall not exceed 36 inches in height. Within 50 feet of the end of the median, plant materials shall not exceed 24 inches in height.
2. Parkways with slopes shall be designed to match the parkway planting theme and plant materials. Slopes shall be a maximum of 3:1. Slopes greater than 3:1 shall use a split/tiered system with a 4'-0" wide, minimum, planter area between the block wall and retaining wall.
3. Natural clustering of tree species is encouraged.
4. Street trees shall be placed to avoid conflicting with utilities and visibility site lines. Street tree placement shall comply with Landscaping Detail L-20 of the Technical Manual for Landscape Design. Street trees in medians shall comply with Landscaping Detail L-21 of the Technical Manual for Landscape Design for distance from the ends of medians. All trees within medians shall have lineal root barriers.
5. Street trees placed within 5'-0" of hardscape elements or walls shall have lineal root barriers.
6. Street trees placed in turf shall have a minimum 4'-0" diameter clear ring around the tree trunk with 3 inches of wood mulch within the ring.
7. A 3-inch thick uniform layer of wood mulch shall be placed in planting areas.
8. Medians shall be designed to have a 2'-0" wide hardscape surface on one edge. Up to 30% of the total landscaped area may be a combination of hardscape and inert or natural groundcovers.
9. Hardscape concepts that are integrated into the overall design and do not dominate the landscape design are acceptable, as determined by the Development Services Director.
10. Landscape designs should be easily maintained.
11. Evergreen trees shall be included in the landscape design, and the inclusion of deciduous varieties is optional.
12. Above grade irrigation equipment, such as controllers, sensors, and backflow devices shall be placed in shrub planting areas for screening purposes.
13. Utility vaults or boxes, irrigation equipment and other above grade utility elements shall not be placed at intersections.
14. Irrigation equipment shall comply with requirements of Section 19.70.040.D. Use of sprayheads is discouraged, and shall not occur within medians with width of 14 feet or less.
15. The landscape design shall not create any sign distance or visibility problems.

C. ***Residential Subdivision Requirements***

1. Parkways along side yards on corner lots and other public areas such as bus stops and cluster-box mailbox areas shall be irrigated and metered separately, and clearly identified by a concrete mow strip, wall or element easily distinguished from private adjacent landscaping. These areas shall be accepted for maintenance by the City.
2. Street trees shall be provided per 19.70.060. A, Street Tree Requirements.
3. A minimum of two (2) 15 gallon front yard trees shall be provided (in addition to street tree requirements).
4. Shrub placement shall achieve 50% cover of the planting area within 5 years of installation. 50% of the shrub quantity shall be 5 gallon or larger. 5-gallon vines shall be placed on fences and walls at a minimum of 20'-0" oc.
5. The front yard turf area shall not exceed 70% of the total planting area.
6. For trees placed in turf, provide a 4'-0" wide minimum clear ring.
7. Concrete stepping pads shall be placed to provide access from side yard gates to driveway and/or walk.
8. Irrigation systems shall be fully automatic. The irrigation controller shall be placed in the garage. Irrigation control wires shall be routed in a 2" diameter Schedule 40 PVC conduit with a minimum of 12" cover.
9. Irrigation valves shall be placed in a location away from the residential entry where they shall be screened with plant materials.
10. All irrigation lines shall be Schedule 40 PVC.
11. The use of low volume irrigation is encouraged in shrub planting areas. Turf shall be irrigated with 6" pop-up heads, when shrubs are irrigated with 6" pop-up heads, when shrubs are irrigated with spray heads 12" pop-up heads shall be used.
12. Automatic rain shutoff devices shall be provided.

D. ***Multi-Family Residential Development***

1. Street trees shall be provided as stated in Subsection A, Street Tree Requirements.
2. Turf area should be confined to use areas such as play areas, and shall otherwise be minimized.
3. Trees, shrubs, groundcovers, and annual color plant material shall be provided, and the plans shall integrate into the design of the multi-family project.
4. Enhanced landscaping shall be provided at entries along with automatic security gates. Such enhanced landscaping shall not adversely affect sight lines for vehicles entering or leaving the project.
5. In parking areas, one 24" box tree shall be provided for every 6 parking stalls. At each end of parking stalls, an 8" wide minimum island shall be provided. Two 24" box trees shall be installed in each parking island. Palm trees may be used in parking islands: when palm trees are used they shall have a 12' high minimum brown trunk. Trees in island planters hall be installed with lineal root barriers. Thirty percent (30%) of the trees in project shall be 36" box size or larger.
6. Between parking islands trees shall be placed in 4' minimum square diamond planters. Parking lot trees in diamond planters shall be installed with root barriers.
7. The use of turf grass shall conform to the MAWA and the EAWU for the project.

8. Parking areas shall be screened by a 36" high shrub border. The shrub border shall be created by installing a double row of 5 gallon shrubs at 3'-6"oc.
9. Trash enclosures, shall be screened with a 6' high shrub hedge. To achieve this hedge, 5-gallon shrubs shall be installed at no greater than 4'oc.
10. Shrubs shall be placed within the planting areas at 1 shrub per every 30 square feet, except where screen requirements may require a denser planting of shrub material. Eighty percent of the required shrub quantity shall be 5 gallon or larger.
11. Where pedestrian plazas, outdoor courtyards, or dining areas, occur shade trees shall be placed to provide a 50% summer time shade cover.
12. Outdoor dining areas shall be enclosed by a 30" high masonry wall and/or shrub hedge. Place 5 gallon or larger vines on structures with one vine per 400 s.f. of structure (two vines minimum).
13. Overhead arbor shade structures may be used to provide shade cover to pedestrian areas. Overhead structures shall be planted with vines.
14. Five-gallon sized vines shall be placed on walls and fences at 20' oc.
15. Planting areas may incorporate the use of inert groundcovers. Up to 25% of the planting area can be covered by an inert groundcover. Shrub planting areas shall have 80% cover after three years of installation.
16. Eighty percent of the shrubs installed shall be 5 gallon or larger.
17. Planting within the site shall incorporate plant materials that complement the streetscape.
18. Site amenities for the project shall include some of the following: clubhouse, pool and spa, basketball court, children's play area, picnic shelters and tables, outdoor patios, lawn bowling, walking trails, dog play area, tennis courts or other court games. The City shall determine which recreation elements will be required.
19. Front yards of duplexes or triplexes shall comply with the standards for typical front yards.
20. Rear and side yards shall be fenced to comply with the standards for single-family housing.

E. ***Slope Stabilization & Planting***

1. Slopes that are 3:1 or steeper and 4 feet or higher, shall plant one approved tree for every 400 square feet, with 70 % of trees 15 gallons sized, and 30% being 5 gallon sized. Trees shall be placed in informal groupings, and be a mix of deciduous and evergreen.
2. Shrubs are to be placed with like species grouped in informal patterns according to hydrozones. Shrubs shall be provided at the rate of one 5-gallon ornamental shrubs for every 75 square feet, and 1 gallon perennial flower/ornamental shrub for every 60 square feet.
3. In addition to shrub materials, an approved groundcover shall be installed using rooted cuttings or 1-gallon plants.
4. Water-wise plants materials shall be used for slope plantings.
5. For slopes 5'-0" in height or greater, an approved erosion control fabric shall be installed. Plant materials shall be installed after erosion control fabric has been installed.

6. Slopes that interface with the street landscape shall incorporate the planting scheme and materials of the street landscape.

F. ***Commercial Landscaping Requirements***

1. Parking Areas
   a. Tree size: Minimum of 15 gallon, 30 percent of trees shall be 36 inch box or larger.
   b. A minimum of one 24-inch box tree per 6 parking stalls
   c. Shade trees shall be provided in accordance with Chapter 19.71.
   d. Trees with fruit, nuts, pepper, or other maintenance intensive characteristics are not encouraged for use as street or parking area trees.
   e. Between parking islands trees shall be placed in 4'-0", minimum, square planters.
   f. At each end of parking stalls, an 8'-0" wide, minimum, island planter shall be provided with two 24" box trees.
   g. Island planter trees shall be installed with lineal root barriers.
   h. Parking areas and drive-through lanes shall be screened by a 36-inch high shrub border using a double row of 5-gallon shrubs at 3 ½ feet o.c.
   i. A minimum of 10 percent of the site shall be landscaped.
   j. Loading areas shall be screened.
   k. Expanses of building and walls shall be broken up with landscaping.
   l. Trash enclosures, loading/unloading areas, and truck parking areas shall be screened/broken up with 6'-0" high shrub hedge. Hedges shall be 5 gallon shrubs spaced at 4'-0" o.c., maximum.
   m. Where loading/unloading areas abut residential areas, parks or a street a 25'-0" planting buffer area shall be provided in addition to any setback of right of ways. A mixture of vertical form deciduous and evergreen trees shall be placed within the planting buffer at 25'-0" o.c. maximum. 15-gallon shrubs shall be provided at 6'-0" maximum to provide a six-foot high screen adjacent to residential areas or parks. Where the loading/unloading area is adjacent to a street, a 6'-0" high shrub screen shall be placed adjacent to the loading/unloading area. In addition to the shrub screen of loading and service areas, trees shall be placed at 15'-0" to 20'-0" o.c. 50% of the trees used for screening shall be 36-inch box size, and 50% shall be 24-inch box size.
   n. Shrubs shall be placed within the planting areas at 1 shrub per each 30 square feet, except where screen requirements may require a denser planting. 80% of the required planting shall be 5 gallon or larger.
   o. Planting within the site shall incorporate plant materials that complement the streetscape.
   p. Enhanced landscaping shall be provided at all points of entry to the site.
   q. Street trees as stipulated in street tree portion of this Ordinance shall be provided.

G. ***Industrial Landscaping Requirements***

1. Same as Section F.

H. ***Model Home Complex Landscape Requirements***

1. Landscaping plans as described in Section 19.70.040 shall be required.
   a. Model homes complexes shall use signs and provide written information to demonstrate the principles of water efficient landscapes as described in this ordinance.
   b. Signs shall identify the model exemplifying water efficient landscape elements such as hydrozones, irrigation equipment, and other features that contribute to the overall water efficient theme.
   c. Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.
2. A minimum of 25 percent of the model homes shall be landscaped with xeriscape designs.
3. All shade structures, arbors, gazebos, pergolas, decks or other structures used in the model complex shall be designed and constructed to meet City building codes.
4. All trap fencing shall be located outside of the public right-of-way. Trap fencing must be secured to be stable throughout the sales period of the model homes.
5. Temporary landscaping shall be provided within a planter area surrounding the sales parking area, as follows:
   a. Twenty-four inch box trees shall be planted near parking spaces at a rate of one tree per every two spaces. Additional trees shall be installed so that the total quantity of trees equals or exceeds the rate of one tree per 30 linear feet. Additional trees shall be sized 24" box or larger. Planting schemes must incorporate the approved City street trees in the model front yards.
   b. Planting concepts used shall employ waterwise garden design principles. This shall include plant selection, reduction of the amount of turf to comply with the typical front yard standards, and use of mulch materials, inert groundcovers and hardscape.
   c. A shrub border shall be installed at the perimeter of the parking lot and maintained at a height of 36". Minimum five-gallon sized shrubs within the screening border shall be installed at 30" o.c. maximum.
6. Model home front yard designs must use concrete mow strip between any turf and plantings.
7. A minimum of 15% of front yard shrubs used shall be 15-gallon material. Not more than 30% of the shrubs shall be one-gallon material. All remaining shrubs shall be five-gallon sized.
8. Turf used in the landscape design shall not exceed the MAWA and EAWU for the model home complex (the project).
9. Groundcover shall be installed in all non-turf planter beds, including up to the stems of shrubs and the trunks of trees.

I. Landscape for Screening

When landscaping is provided for screening purposes, the following criteria shall be met:

1. Plant material shall be sized and spaced appropriately to ensure 100 percent screening within three years of installation.

2. The plant material shall be of variety that will retain screening qualities at all times of the year.
3. The landscape shall be maintained in a viable and healthy growth condition.
4. The landscape screen shall be served by a permanent automatic irrigation system..

19.70.070 INSPECTIONS AND CERTIFICATION

A. Inspections for Privately Maintained Landscaping

Upon approval of the Landscape Plans, the Development Services Department shall provide the applicant with one set of the approved plans to be kept on the project site for inspection purposes. For privately maintained areas, a minimum of three (3) landscape inspections shall be conducted by the City, as follows:

1. Upon the installation of the irrigation equipment, when trenches are open and the system can be pressurized to 150 pounds-per-square-inch for four hours;
2. After soil preparation, at the time the plant materials are positioned and ready to plant;
3. And at the time plant materials are fully installed and the irrigation system is functional.

B. Inspections for Publicly Maintained Landscaping

Upon approval of the Landscape Plans, the Development Services Department will provide the applicant one set of the approved plans to be kept on the project site for inspection purposes.. For areas to be accepted for maintenance by the City, a minimum of four (4) landscape inspections shall be conducted by the City, as follows:

1. Upon the installation of the irrigation equipment, when trenches are open and the system can be pressurized to 150 pounds-per-square-inch for four hours;
2. After soil preparation, at the time the plant materials are positioned and ready to plant;
3. At the time plant materials are fully installed and the irrigation system is functional. Any equipment, devices, lighting, pumps and appurtenances must be fully functional at the time of the third inspection. When the third inspection is approved and finalized by the City's Landscape Architect, a one-year period of maintenance will be required prior to the fourth inspection.
4. The fourth inspection will take place a minimum of one year after obtaining approval of the third inspection. This time period will be extended if the improvements are not maintained at a high standard as required during the year. When the fourth and final inspection is approved and finalized by the City's Landscape Architect, the City will accept the improvements for maintenance. . The following shall be provided before the fourth inspection can be approved and finalized by the City's Landscape Architect and the Public Works Department:
   a. A set of City approved "as-builts" on mylar.
   b. A Landscape and Irrigation Maintenance Schedule shall include the checking, routine inspection, adjustment and repair of the irrigation system and its components; resetting and adjusting the automatic controllers; aerating and

dethatching turf areas; replenishing mulch; fertilizing; pruning and weeding in all landscaped areas.

c. A Maintenance Schedule for non-landscaped areas shall include the checking, routine inspection, adjustment, painting, replacement and repair of lighting; playground equipment; monument areas and signage; and other appurtenances.
d. The Landscape Plan Check Application and Water Budget Agreement entered into with Eastern Municipal Water District or the City of Perris, along with a copy the most recent Monthly Water Budget Statement for Landscape Meters as provided by EMWD or the City of Perris.
e. Meter and account information for all utilities.
f. Equipment, warranties, keys, manuals and software.

(Ord. 1265, Feb 2010)