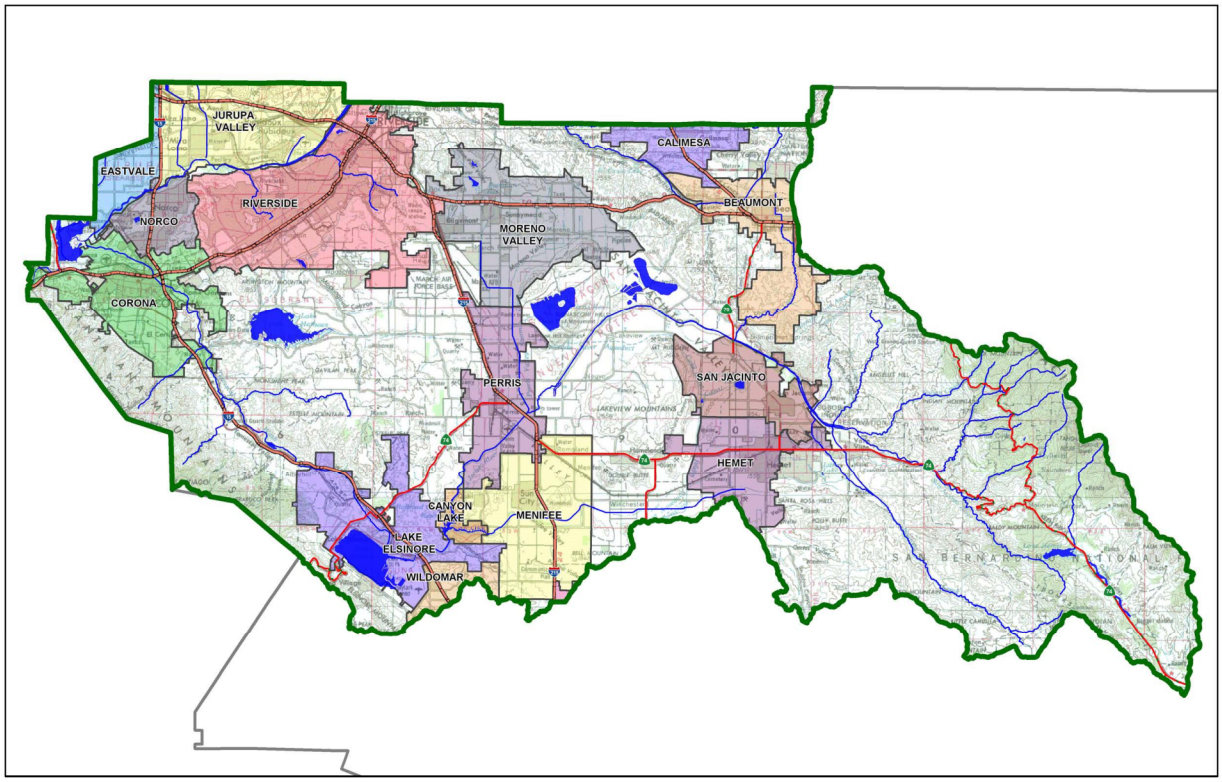
Project Specific Water Quality Management Plan

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

Project Title: **Pennington Industrial Park**

Development No: **IDR-2019-00001**

Design Review/Case No: **PAR-2018-00006**



☒ **Preliminary**
☐ **Final**

Original Date Prepared: **2/27/2019**

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

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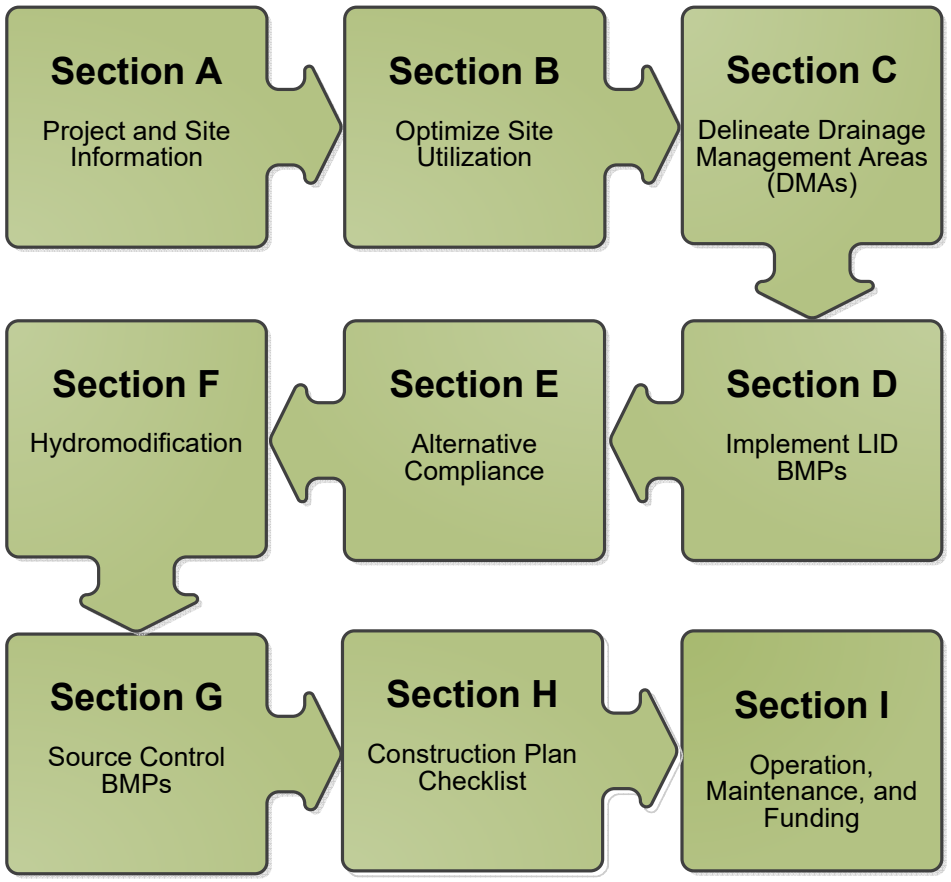
Note: Site-Specific and/or design-related responses to template inquiries are highlighted in bold and/or blue color (color of this text) throughout the main body (template) of this WQMP.

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 **Pennington Industrial, LLC** by **SB&O Inc.** for the **Pennington Industrial Park** 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."

at Final WQMP

Owner's Signature

Date

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."

Bradley Knepp

Preparer's Signature

5-17-2019

Date

Bradley Knepp

Preparer's Printed Name

Proj. Engr.

Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	**Light Industrial / Commercial**
Planning Area:	**City of Lake Elsinore**
Community Name:	**Minthorn and Chaney Streets**
Development Name:	**Pennington Industrial**
PROJECT LOCATION	
Latitude & Longitude (DMS):	**N33°41'00" W117°20'04"**
Project Watershed and Sub-Watershed:	**Santa Ana River, Temescal Creek**
Gross Acres:	**4.8 acres**
APN(s):	**377-160-014**
Map Book and Page No.:	**Map Book 8, Page 378**
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	**Business Park / Light Industrial/Commercial**
Proposed or Potential SIC Code(s)	**4241, 4225, 4226, 1541**
Total Area of Project Footprint **(onsite and offsite combined)** (SF)	**247,339 sf**
Total Area of proposed Impervious Surfaces within Project Footprint (SF)/or Replacement	**208,449 sf**
Does the project consist of offsite road improvements? **(57,314 sf)**	☒ **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)	**HSG B soil only per NRCS Report; Geotech Report also attached.**
What is the Water Quality **(85th Percentile 24-hr)** Design Storm Depth for the project?	**0.69 inches**

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, 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	CAL 2014/2016 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Temescal Creek, Reach 6	**Indicator Bacteria**	**MUN, GWR, REC1, REC2, WARM, WILD**	**None**
Temescal Creek, Reach 5	**n/a**	**MUN, AGR, GWR, REC1, REC2, WARM, WILD RARE**	
Temescal Creek, Reach 4	**n/a**	**MUN, AGR, GWR, REC1, REC2, WARM, WILD RARE**	
Temescal Creek, Reach 3 (Lee Lake)	**None**	**MUN, AGR, IND, GWR, REC1, REC2, WARM, WILD**	
Temescal Creek, Reach 2	**None**	**MUN, AGR, IND, GWR, REC1, REC2, WARM, WILD**	
Temescal Creek, Reach 1A & 1B	**n/a**	**MUN, REC2, WARM, WILD**	
Santa Ana River, Reach 3	**Pathogens, Nitrates**	**MUN, REC1, REC2, WARM, WILD, RARE**	

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 Grading Permit**	☒ **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?

Yes, existing drainage patterns were identified; no, existing drainage patterns were not fully preserved by design. A significant portion of the site runoff in the existing condition discharges to the developed property to the southeast and enters that property's onsite underground storage facility. We have chosen to discharge no proposed flows into this adjoining system as it would require a private stormwater discharge agreement. All proposed flows are discharged into Chaney Street. The ultimate discharge location, Temescal Creek, is unchanged.

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

No. The site has been mass graded in the past and is mostly barren of existing vegetation. New vegetation (commercial landscaping with irrigation) will be provided with the development of the site.

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

Infiltration is not feasible due to seasonal high groundwater at 10 ft below ground surface, per the geotechnical engineering report, Appendix 3. Further, infiltration is not recommended due to very significant over-excavation/compaction requirements on the site (18-20 feet under pads) which will impact well beyond the pad limits as well.

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

All impervious area is identified based on the proposed architectural requirements and design of the site.

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

Yes, to the maximum extent practicable, but not for all impervious surfaces. Factors mitigating against pervious area dispersion include: a) infiltration is not feasible (see above); b) site design and grading requirements, due in part to the in-fill nature of the site allow only limited areas, typically at the site perimeter, for some pervious area dispersion.

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
Onsite	**Roof, Pavement, Concrete and/or Asphalt and Ornamental Landscaping**	**190,025**	**D**
Offsite	**Pavement, Sidewalk, Parkway**	**57,314**	**D**

[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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)

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

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

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

DMA Name or ID	BMP Name or ID
Onsite	**Modular Wetlands Unit (8 x 24)**
Offsite	**Modular Wetlands Unit (4 x 15)**

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**

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 Copermittee, 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, a Phase I Environmental Site Assessment has been prepared, included 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.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?	X	
If Yes, list affected DMAs: **Onsite and Offsite**		
…have any DMAs located within 100 feet of a water supply well?		X
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? **No, but see last question in this table, below.**		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour? **No tests, due to groundwater table.**	n/a	n/a
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? **18-20 ft over-excavation removals and replacements at bldg pads impacting most site soils**	X	
If Yes, list affected DMAs: **Onsite, Offsite**		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	X	
Describe here: **See page 6 of soils report (soils report in Appx. 3) under General, last paragraph.**		

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: **0.81 acres**

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

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: **4.0 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: **1.266**

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: **5.04 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)
5.04 acres	**0.81 acres (NOT FEASIBLE)**

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: ***30 (estimated at 10 per each of 3 proposed buildings)***

Project Type: ***Light industrial***

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: **4.0 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: ***195***

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: ***780***

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)
780	**30 (NOT FEASIBLE)**

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.

N/A

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:

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:

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:

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:

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)**

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. **This was discussed with City staff as probable, based on all geotechnical considerations, prior to submittal of this WQMP.** 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	
Onsite	☐	☐	☐	☐	☒
Offsite	☐	☐	☐	☐	☒

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.

See Appendix 5.

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 (Vbmp) 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**	***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]

[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

Table D.3 is not applicable due to Alternative Compliance BMP being flow-based. However, the Vbmp (DCV) calculation is provided for reference on template-provided spreadsheet 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.

Onsite, Offsite

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
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☒ **Commercial/Industrial Development**	P(3)	**P**	**P(1)**	**P(1)**	P(5)	**P(1)**	**P**	**P**
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft²)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft²)	P	N	P	P	N	P	P	P
☒ **Parking Lots (>5,000 ft²)**	**P(6)**	**P**	**P(1)**	**P(1)**	**P(4)**	**P(1)**	**P**	**P**
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
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]
In-fill development	**10%**

[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

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)*
	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

In order to avoid duplication, redundancy (and therefore potential error and confusion on the part of the reader), the reader is referred to Appendix 6 where the Vbmp and Qbmp calculations, identical to those requested in Table E.3, above, are provided on the *template-provided* spreadsheets. A summary of (applicable) Qbmp results is shown in the table below.

DMA Name	Design
Onsite	**Qbmp: 0.625 cubic feet per second**
Offsite	**Qbmp: 0.161 cubic feet per second**

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

Treatment Control BMP Name[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]
BioClean Modular Wetlands System	**Bacterial Indicators**	**60-83%**
	Metals	**Copper / Zinc 50-86%**
	Nutrients	**Nitrogen 45-75%; Phosphorus 64-67%**
	Pesticides	**Tetrachlorophenol 5 & 6 26-46% Pentachlorophenol 58-66%**
	Petroleum Hydrocarbons	**84% - 100%**
	Sediments	**85% - 99%**
	Trash & Debris	**100% - Approved full trash capture device by State Water Quality Control Board**
	Oil & Grease	**Oil 90-95%**

[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) **[used for volume calcs below, see Appendix 7]**, 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	**15 minutes**	**Much greater in post-condition due to subsurface detention**	**Much greater in post- condition due to subsurface detention**
Volume (Cubic Feet)	**18,918 cubic feet released (whole site for 2-yr 24-hr)**	**15,780 cubic feet released (2-yr 24-hr post- vol. [25,933 cf] minus 10-yr 24-hr volume detained [10,153 cf])**	**17% less released in post-condition due to detention of 10-yr 24-hr event.**

[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:

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
Storm Drain Inlets	**Inlets shall be marked with words "Only Rain Down the Storm Drain" or similar wording.**	• **Wording shall be maintained or replaced per the O&M Schedule in Appendix 9.** • **See applicable operational BMPs in SC-44 in Appendix 10.** **The following shall be included 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 maintenance/ Outdoor Pesticide Use	**Final landscape plans shall accomplish the following:** • **Landscape shall be designed to minimize irrigation and runoff, promote surface infiltration where**	• **Maintain landscaping using minimal pesticides.** • **See "What You Should Know for**

	appropriate, and minimize use of fertilizers and pesticides that can contribute to stormwater pollution. • Consideration given to use of pest-resistant plants especially adjacent to hardscape. • For successful establishment, plants shall be selected appropriate to site soils, slopes, climate, sun, rain, land use, ecological consistency, and plant interactions.	Landscape and Gardening" brochure in Appendix 10. • Provide Integrated Pest Management information to new owners, lessees, and operators.
Outdoor Refuse Areas and Litter/Trash & Debris Control	• Site refuse area shall be walled, covered, curbed and graded to prevent run-on. • Signs will be posted on or near dumpsters with the words, "Do not dump hazardous materials here" or similar wording.	• Maintain adequate number of receptacles and inspect 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 onsite. • See applicable operational BMPs in SC-34 in Appendix 10.
Sidewalks and Parking Lots & Sweeping	-	• Vacuum sweep sidewalks and parking lot monthly to prevent accumulation of litter and debris.
Loading Docks	• Roof downspouts shall be positioned to direct stormwater away from the loading dock. • Water from depressed loading dock areas shall be pumped to drain to the onsite storm drain system. • 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 Appendix 10.
Fire Sprinkler Test Water Roofing, Gutters and Trim	• Provide a means to drain fire sprinkler test water to the sanitary sewer. • Avoid roofing, gutters and trim made of copper or other unprotected metals that may leach into runoff.	See Fact Sheet SC-41 "Building and Grounds Maintenance" in Appendix 10.

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)
Onsite	**BioClean Modular Wetlands System (8' x 24' with underground inlet)**	**CGP – provided in Prelim WQMP (PGP sheets provided in Final)**	**33.6830°N 117.3353°W**
Offsite	**BioClean Modular Wetlands System (4' x 15' with curb inlet)**	**CGP – provided in Prelim WQMP (PGP sheets provided in Final)**	**33.6830°N 117.3353°W**

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: **All maintenance of the storm drain system and BMPs shall be the responsibility of the property owner.**

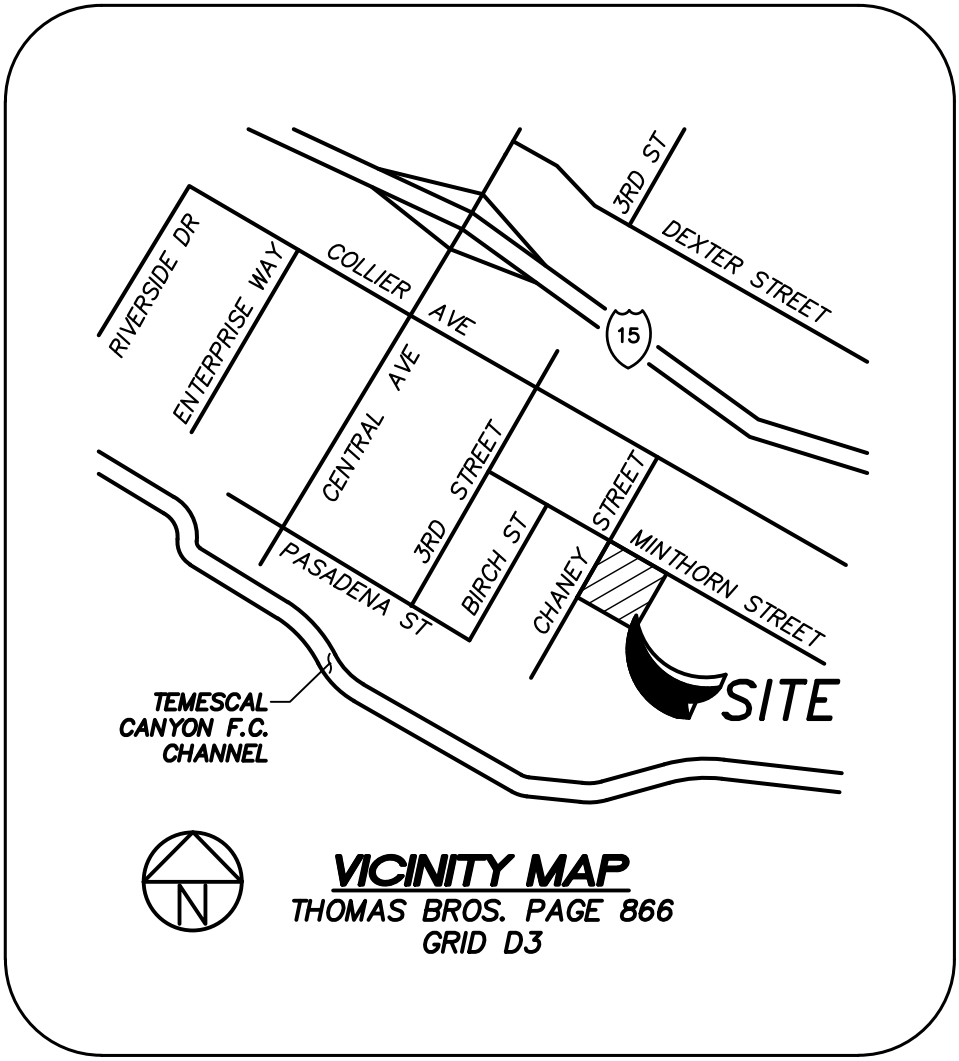
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ 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.

Appendix 1: Maps and Site Plans

Vicinity Map
County Stormwater Tracking Tool Report
85th Percentile 24-hour Precipitation Map
Receiving Waters Map
WQMP Site Map



VICINITY MAP

THOMAS BROS. PAGE 866
GRID D3

WQMP Project Report

County of Riverside Stormwater Program

Santa Ana River Watershed Geodatabase

Tuesday, January 08, 2019

Note: The information provided in this report and on the Stormwater Geodatabase for the County of Riverside Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s):	377160014, 377160033
Latitude/Longitude:	33.6831, -117.3344
Thomas Brothers Page:	866
Project Site Acreage:	4.43
Watershed(s):	SANTA ANA
This Project Site Resides in the following Hydrologic Unit (s) (HUC):	**HUC Name** - HUC Number **Arroyo Del Torro-Temescal Wash** - 180702030601
The HUCs Contribute stormwater to the following 303d listed water bodies and TMDLs which may include drainage from your proposed Project Site:	**WBID Name** - WBID Number **Santa Ana River, Reach 3** - CAR8012100019990211140353 **Temescal Creek, Reach 1** - CAR8012500019991014110146 **Temescal Creek, Reach 6 (Elsinore Groundwater sub basin boundary to Lake Elsinore Outlet)** - CAR8013500020081204163614
These 303d listed Water bodies and TMDLs have the following Pollutants of Concern (POC):	**Bacterial Indicators** - Pathogens **Metals/Metalloids** - Copper, Lead **Miscellaneous** - pH
Limitations on Infiltration:	**Project Site Onsite Soils Group(s)** - B **Known Groundwater Contamination Plumes within 1000'** - No **Adjacent Water Supply Wells(s)** - No information available please contact your local water agency for more information. Your local contact agency is ELSINORE VALLEY M.W.D.. Your local wholesaler contact agency is METROPOLITAN WATER DISTRICT.
Environmentally Sensitive Areas within 200'(Fish and Wildlife Habitat/Species):	None
Environmentally Sensitive Areas within 200'(CVMSHCP):	None
Environmentally Sensitive Areas within 200'(WRMSHCP):	Burrowing Owl Survey Required Area
Groundwater elevation from Mean Sea Level:	1209
85th Percentile Design Storm Depth (in):	0.69
Groundwater Basin:	Warm Springs Valley
MSHCP/CVMSHCP Criteria Cell(s):	No Data
Retention Ordinance Information:	No Data
Studies and Reports Related to Project Site:	MPD Hydrology Tabulations MPD Map MPD Report 11-1990 MPDHydrology Study Cover_Index1 MPDHydrology Study Plates 1-9 MPDHydrology Study Plates 10-19 MPDHydrology Study Plates 20-29 MPDHydrology Study Plates 30-39 MPDHydrology Study Plates 40-49 MPDHydrology Study Plates 50-59 MPDHydrology Study Plates 60-69 MPDHydrology Study Plates 70-79 MPDHydrology Study Plates 80-89 MPDHydrology Study Plates 90-99 MPDHydrology Study Plates 100-109 MPDHydrology Study Plates 110-112 MPDHydrologyStudyDelinationsCover Pages from MPD Report 11-1990-2 IBI Scores - Southern Cal ElsinoreBasin bulletin118_4-sc water_fact_3_7.11 8039-SAR-Hydromodification Complete Final GWMP_Mar 2005 Urban Water Management Plan Comprehensive Bacteria Reduction Plan 2012 Annual Report of Santa Ana River

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
Site 0.69 inches (85th Percentile 24-hour event)
0.70 SanJacintoNWS
0.87 VistaGrandeGS
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

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | HEMET | CANYON LAKE | LAKE ELSINORE | 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

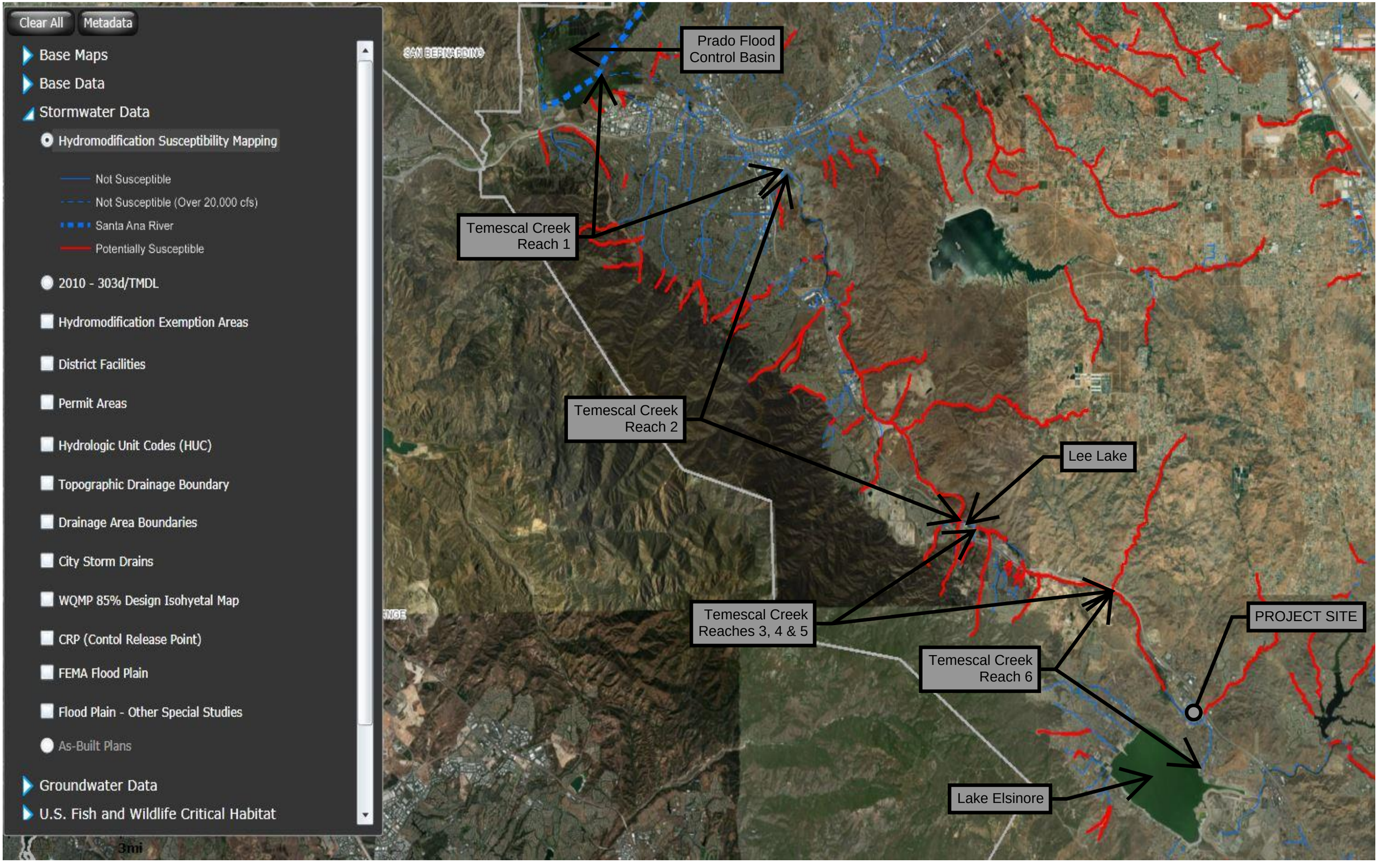
N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011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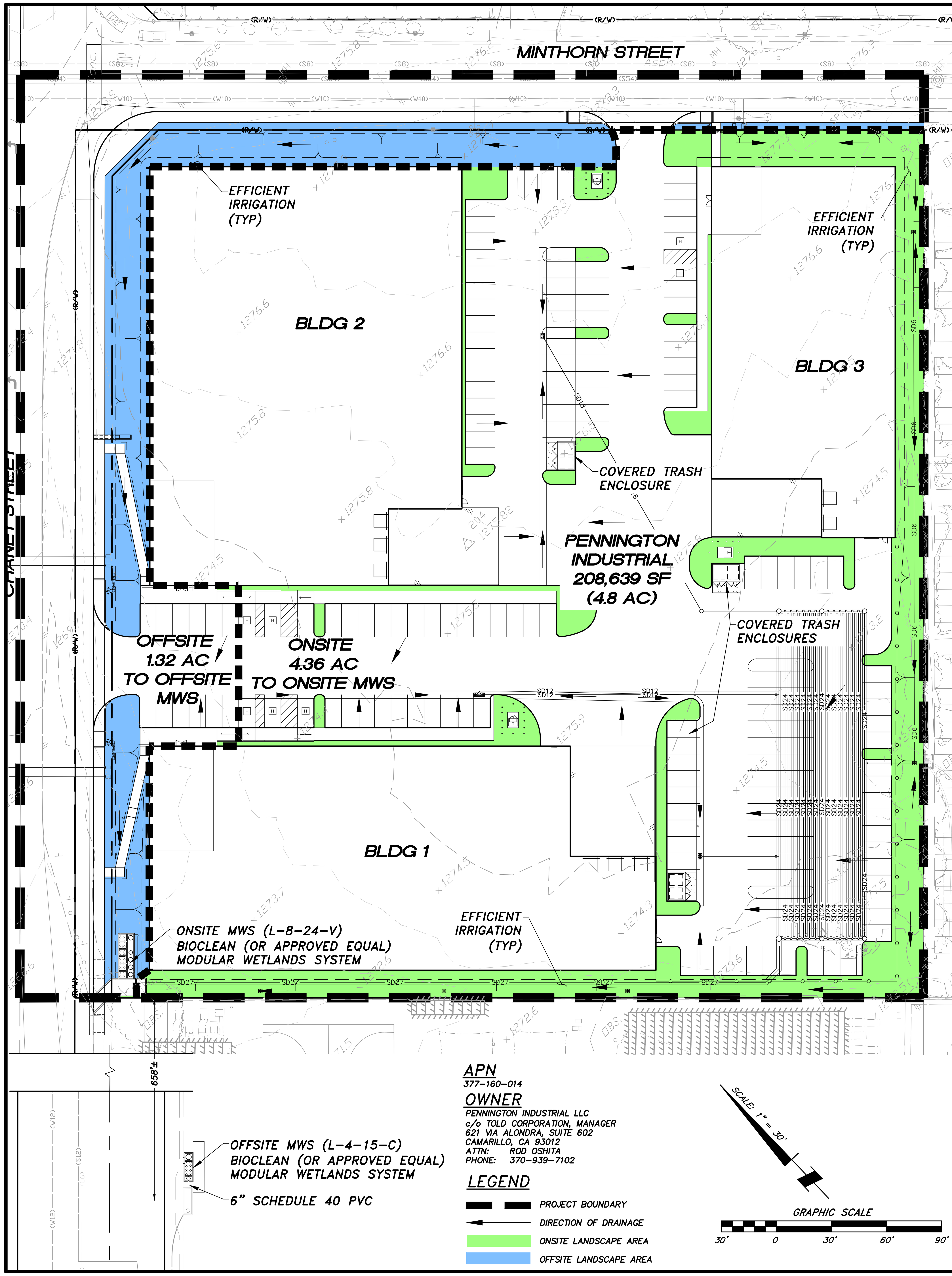
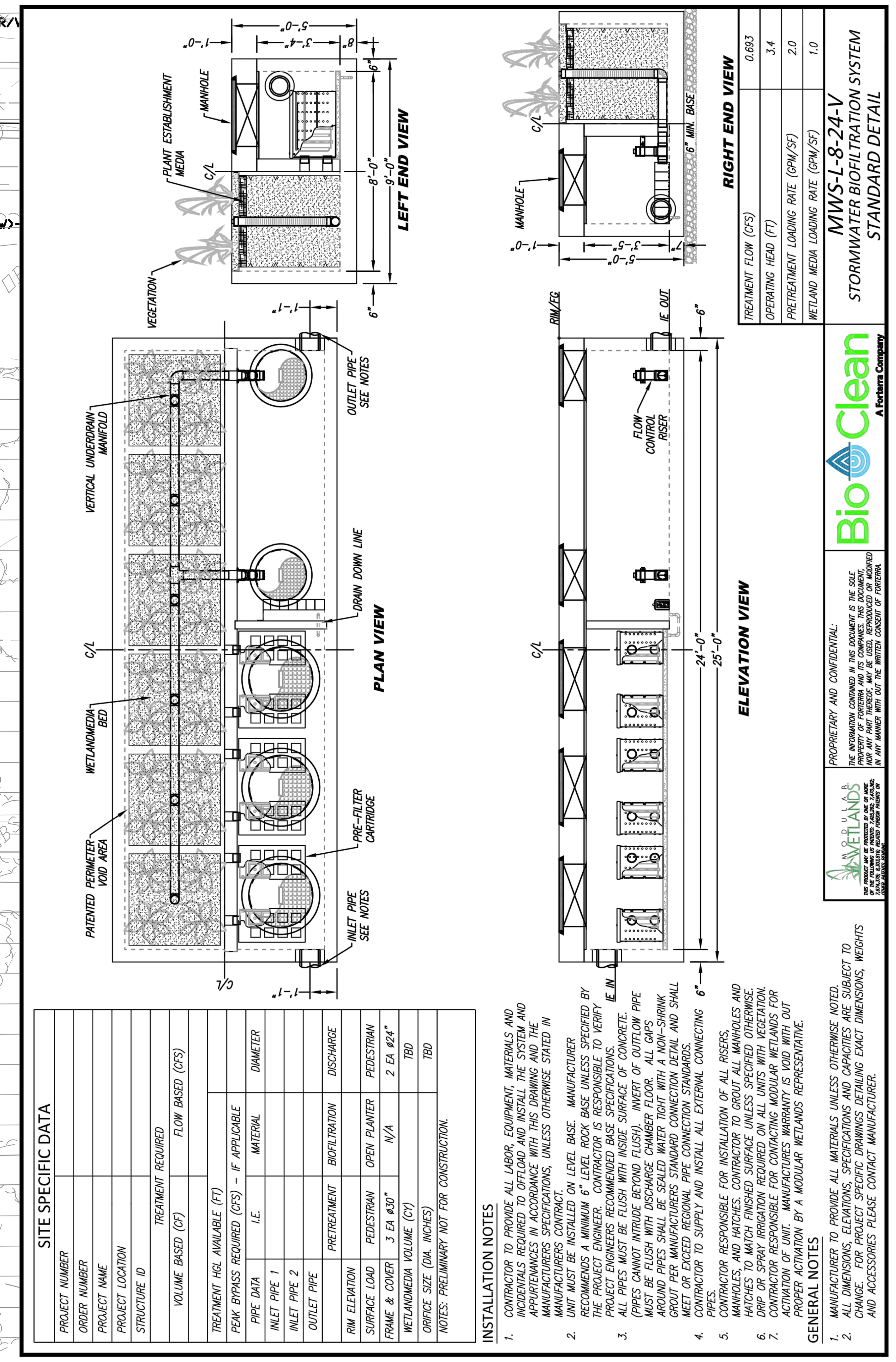
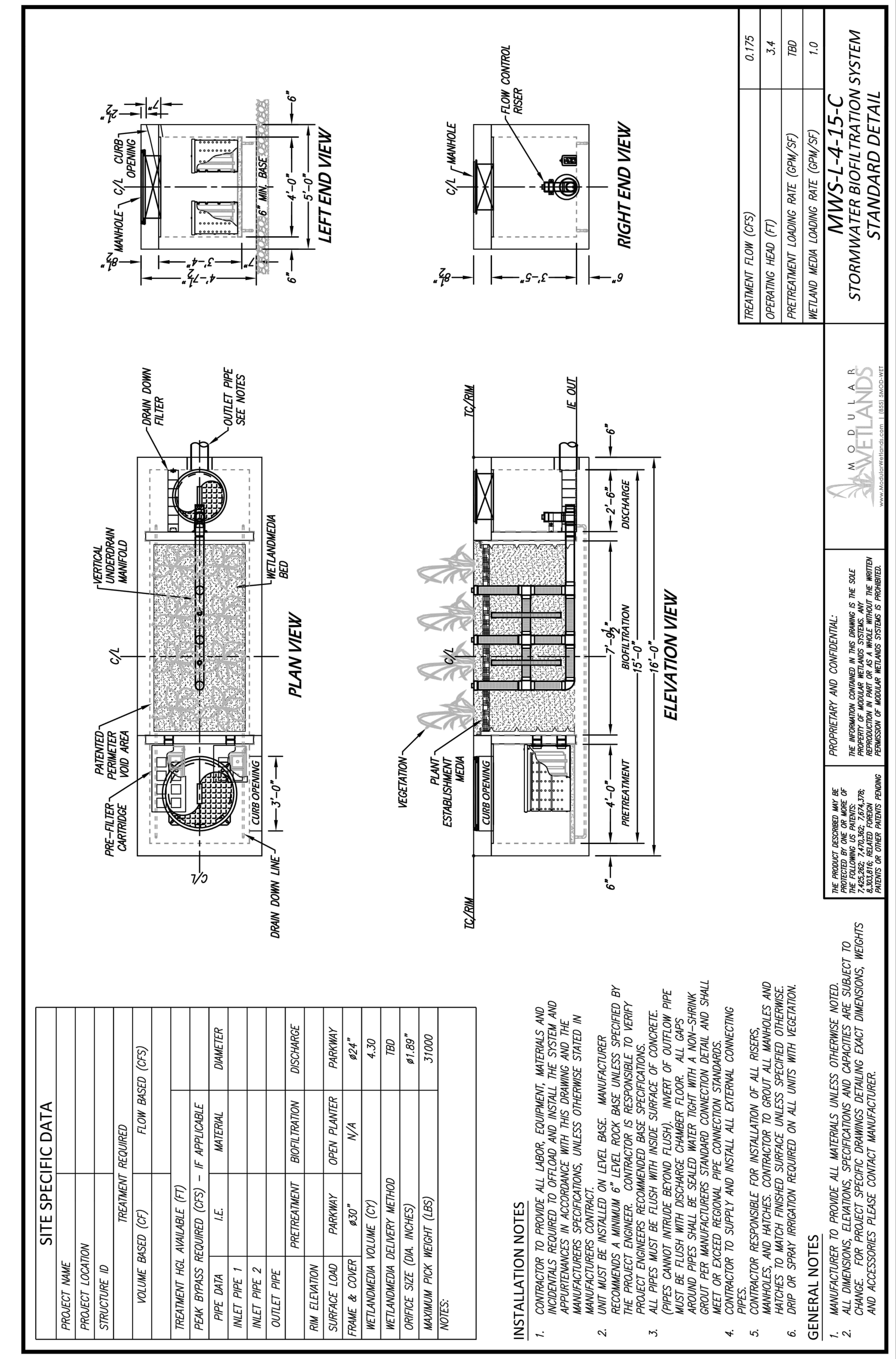
Metadata
Base Maps
Base Data
Stormwater Data
Hydromodification Susceptibility Mapping
Not Susceptible
Not Susceptible (Over 20,000 cfs)
Santa Ana River
Potentially Susceptible
2010 - 303d/TMDL
Hydromodification Exemption Areas
District Facilities
Permit Areas
Hydrologic Unit Codes (HUC)
Topographic Drainage Boundary
Drainage Area Boundaries
City Storm Drains
WQMP 85% Design Isohyetal Map
CRP (Contol Release Point)
FEMA Flood Plain
Flood Plain - Other Special Studies
As-Built Plans
Groundwater Data
U.S. Fish and Wildlife Critical Habitat
3mi
SAN BERNARDINO
Prado Flood Control Basin
Temescal Creek Reach 1
Temescal Creek Reach 2
Lee Lake
Temescal Creek Reaches 3, 4 & 5
Temescal Creek Reach 6
PROJECT SITE
Lake Elsinore



APN
377-160-014

OWNER
PENNINGTON INDUSTRIAL LLC
c/o TOLD CORPORATION, MANAGER
621 VIA ALONDRA, SUITE 602
CAMARILLO, CA 93012
ATTN: ROD OSHITA
PHONE: 370-939-7102





SB&O INC.
PLANNING ENGINEERING SURVEYING

Pennington Industrial Job No: 74422
Site Design Vbmp & Qbmp and Water Quality HCOCV calculations By: BCK
[for City Detention (10-yr 6- & 24-hr events) Volume calculations, see Drainage Report] Date: 5/16/2019
Sheet: 1 of 1

Precipitation depth for 85th-Percentile 24-hr event per 85th Percentile Precipitation Map, Appendix 1.
HCOC 2-yr 24-hr mitigation (post - pre) volume analysis required. NRCS *TR-55* method is utilized below (*TR-55* approved per *SAR WQMP* (guidance), p. 68, 2012).
City also requires greater of 10-yr 6- or 24-hr event mitigation (post - pre) volume analysis. Same method used for Detention calculatoins; please see Drainage Report for detention calculations.
Precipitation depths from 2-yr 24-hr event per NOAA Precipitation Data Server at project site location, Appendix 7.
Existing site imperviousness is 0.00%. Existing site cover is Barren/graded per RCFC Hydro Mnl Plate D-5.5, and Falow/Bare per NRCS TR-55 Table 2-2c, Appendix 7.
Proposed site cover is Commercial per *RCFC Hydrology Manual* Plate D-5.6 and Commercial per *NRCS TR-55* Table 2-2a. See also Note 3 below.

Table of Site Design Vbmp & Qbmp, Water Quality HCOCV (2x24), and City Detention (10x6/10x24) Calcs to Determine Minimum Detention Volume for Proposed Site

Storm Event	Precip Depth (in)	(A) Area (sf)	Area (ac)	Perv-ious Area (sf)	Imperv-ious Area (sf)	Pervious Percent (%)	Imperv Percent (%)	Effective Imperv Fraction of Pervious Area per SAR WQMP, Table 2-1, p.22	(B) Design Vbmp per SAR WQMP, p.23 (cf)	(C) Qbmp per SAR WQMP p.23 (cfs)	(D) Design Qbmp per SAR WQMP Table 3-8, p.65 (cfs)	(E) Whole Site NRCS Hydro-logic Soil Group	(F) Whole Site Ex Cond. Runoff Index Curve No.	(G) Whole Site Prop Cond. Runoff Index Curve No.	(H) Whole Site Exist Cond. Storm Event Runoff Volume (cf)	(I) Whole Site Prop Cond. Storm Event Runoff Volume (cf)	(J) WQ Permit Release Limit 105% of Ex Runoff Volume (cf)	(K) Mitigation Volume [2x24 Vol = (I) - (J)] [10yr Vols = (I)-(H)] (cf)
Storm Event Precipitation Depths and Site Area Data with Vbmp and Qbmp Calculations												Water Quality HCOC Volume Calculations per NRCS *TR-55*, 1986						
Onsite 85th% 24-hr	0.69	190,025	4.36	23,430	166,595	12.3%	87.7%	0.10	8,693	0.694	0.625							
Offsite 85th% 24-hr	0.69	57,314	1.32	15,460	41,854	27.0%	73.0%	0.10	2,245	0.179	0.161							
Onsite 2-yr 24-hr	2.44	190,025	4.36									B	86	92	18,918	25,933	19,864	6,069
Offsite 2-yr 24-hr	2.44	57,314	1.32									B	86	92	5,706	7,822	5,991	1,831
		247,339	5.68	38,890	208,449	15.7%	84.3%								24,624	33,755	25,855	7,900

Notes on Table above:

1. For Vbmp & Qbmp calculation in columns (B) & (C), see also template-required spreadsheets, Appendix 6. For column (D), see Table E.2 of WQMP (Alt. Compliance, in-fill development).
2. (E) shows Hydrologic Soil Group (HSG) per NRCS Soils Report, Appendix 3.
3. (F) & (G) Runoff Index (Curve) Numbers are the more conservative of the two similar sets: 1) Plates D-5.5 & D-5.6 of *RCFC Hydro Mnl &* 2) Tables 2-2a & 2-2c of *TR-55,* pp. 2-5 & 2-6.
4. (H) & (I) show results for storm event existing and proposed runoff depth, Q, in inches (per Eq. 2-3 of *TR-55,* p. 2-1), multiplied by Site Area (A) to obtain site runoff volume.
5. (J) for the 2x24 event is per HCOC volume release limits described in Section 3.6, Hydromodification, *SAR WQMP*, pp. 68-69, and for the 10x events, per the post- minus pre- volumes.

Hydraulic Discharge Design Conditions

a) Site detention volume is controlled by the 10x24 event. See Drainage Report.
b) Per geotechnical engineering considerations identified in the WQMP, all infiltration and bioretention are infeasible, and no untreated or treated runoff is retained in native onsite soils.
c) Controlled release of site flows will be per the flow rate corresponding to the controlling design storm event, or the design Qbmp.
d) A BioClean modular wetlands device (City-approved) is proposed to receive the design Qbmp flow rate.
e) Storms generating flow rates in excess of the Qbmp will bypass the WQ device and discharge to the street gutter (both onsite and offsite).
f) Note the HCOC is cared for since the onsite volume retained is greater than even the sum of the onsite and offsite HCOC Volumes above.

SB&O INC.
PLANNING ENGINEERING SURVEYING
3990 Ruffin Road, Suite 120
San Diego, Ca. 92123
858-560-1141
858-560-8157 Fax

WQMP SITE MAP
PENNINGTON INDUSTRIAL

SHEET 1 OF 1

PRELIM 5/16/2019 74420.65

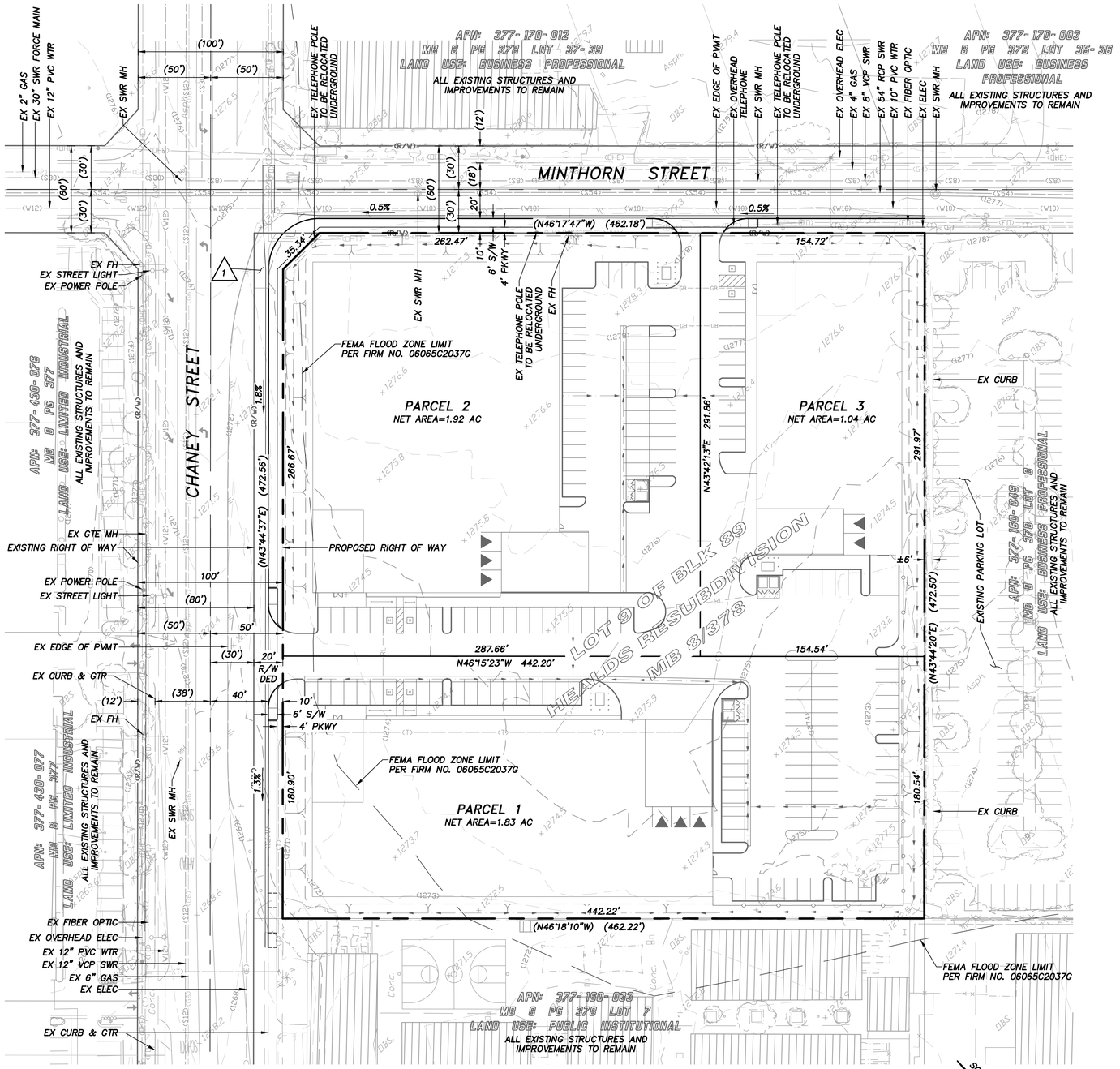
I:\74422 Pennington Industrial\Dwg\Z-74422-zWM.dwg

Appendix 2: Construction Plans

Grading and Drainage Plans

TENTATIVE PARCEL MAP No. 37710

CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE
STATE OF CALIFORNIA



SCALE: 1" = 40'

GRAPHIC SCALE
40' 0 40' 80' 120'

LEGEND

(R/W)	EXISTING RIGHT-OF-WAY
	EXISTING PROPERTY LINE
	PROPOSED BOUNDARY LINE
	PROPOSED PROPERTY LINE
	STREET CENTERLINE
	EXISTING CURB & GUTTER
	EXISTING SIDEWALK
(626)	EXISTING CONTOUR
626	PROPOSED CONTOUR
	DIRECTION OF DRAINAGE
	PROPOSED SLOPE
	PROPOSED CURB/CURB & GUTTER
S6	PROPOSED SEWER
W2	PROPOSED WATER
(S8)	EXISTING SEWER
(W12)	EXISTING WATER
(SD42)	EXISTING STORM DRAIN
(UGE)	EXISTING UNDERGROUND ELECTRICAL
	EXISTING STREET LIGHT
	EXISTING PALM TREE
	EXISTING SINGLE TREE
	EXISTING CATCH BASIN
	EXISTING FIRE HYDRANT
	EXISTING METER / UTILITY
	EXISTING MAN HOLE
	EXISTING LIGHT POLE
	UTILITY POLE
	EXISTING SIGNS
	EXISTING STREET SIGN
	EXISTING GATE
	EXISTING VALVE
	EXISTING ARROW / STRAIGHT
	EXISTING ARROW / TURNS
	EXISTING ARROWS / TURNS
EXIT STOP AHEAD ONLY YIELD	EXISTING TRAFFIC PAINT
	EXISTING TRAFFIC PAINT

OWNER/DEVELOPER

PENNINGTON INDUSTRIAL LLC
c/o TOLD CORPORATION, MANAGER
621 VIA ALONDRA, SUITE 602
CAMARILLO, CA 93012
ATTN: ROD OSHITA
PHONE: 310-939-7102

ENGINEER

SB&O INC.
41689 ENTERPRISE CIRCLE, STE 126
TEMECULA, CA 92590
ATTN: DON BROOKS
PHONE: 951-695-8900

LEGAL DESCRIPTION

APN: 377-160-014

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

LOT 9 IN BLOCK 89 OF HEALDS RESUBDIVISION, IN THE CITY OF LAKE ELSINORE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 8, PAGE 378 OF MAPS, SAN DIEGO COUNTY RECORDS.

EXISTING EASEMENTS:

1. THE EFFECT OF A DEED TO THE CITY OF LAKE ELSINORE FOR PUBLIC ROAD PURPOSES, INCLUDING PUBLIC UTILITY AND PUBLIC SERVICE USES.

   RECORDED: JANUARY 26, 1979 AS INSTRUMENT NO. 19172 OF OFFICIAL RECORDS.
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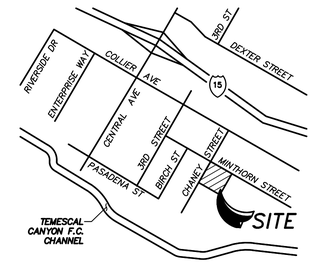
PROJECT INFORMATION

1. LOT SUMMARY
   LOT 1: 79,914.60 SF, 1.83 AC
   LOT 2: 83,584.60 SF, 1.92 AC (MAX)
   LOT 3: 45,139.44 SF, 1.04 AC (MIN)
   TOTAL: 208,638.64 SF, 4.79 AC
2. UTILITY PURVEYORS:

CHARTER SPECTRUM	(951) 406-1645
ELSINORE VALLEY MUNICIPAL WATER DIST	(951) 674-3146
CITY OF LAKE ELSINORE	(951) 674-3124
SC EDISON COMPANY	(800) 366-7801
SC GAS COMPANY	(800) 423-1391
UNDERGROUND SERVICE ALERT	(800) 227-2600
CROWN CASTLE	(888) 632-0931

3. PROJECT DESCRIPTION: THREE INDUSTRIAL BUILDINGS
4. EXISTING ZONING: M1 LIMITED MANUFACTURING
   BUILDING SETBACKS:
   FRONT YARD: 20'
   SIDE YARD (ROW): 20'
   LANDSCAPE SETBACKS:
   ADJACENT TO STREET: MIN. 15'; AVERAGE 20'
   LANDSCAPE COVERAGE: 12%
5. EXISTING LAND USE: LIMITED INDUSTRIAL
6. TYPE OF IMPROVEMENTS PROPOSED:
   OFFSITE: STREETS, STREET LIGHTS, STRIPING, CONNECTION TO SEWER, WATER AND UTILITIES
   ONSITE: DRAINAGE, SEWER, WATER, UTILITIES, GRADING
   ESTIMATED CONSTRUCTION DATE: ???

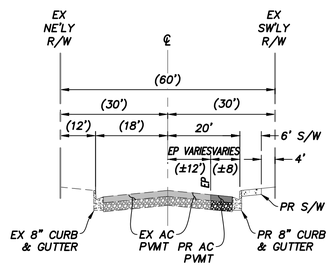


VICINITY MAP

THOMAS BROS. PAGE 866
GRID D3

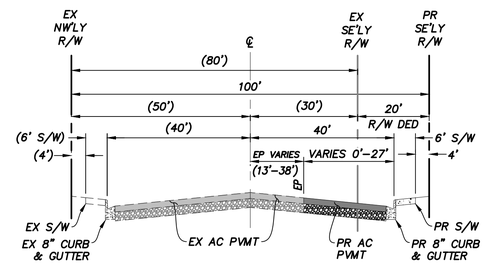
SOURCE OF TOPOGRAPHY

INLAND AERIAL SURVEYS, INC.
FLIGHT DATE: 11-01-18, CONTOUR INTERVAL = 1 FOOT



TYPICAL SECTION MINTHORN STREET

STREET DESIGNATION: LOCAL
SCALE: 1"=20' (H.); 1"=4' (V)



TYPICAL SECTION CHANEY STREET

STREET DESIGNATION: MAJOR ARTERIAL
SCALE: 1"=20' (H.); 1"=4' (V)

BENCH MARK

DESIGNATION: EL-35-80
DESCRIPTION: DESCRIBED BY RIVERSIDE COUNTY FROM THE INTERSECTION OF RIVERSIDE DRIVE AND LAKESHORE DRIVE SE 1.2 MI. ALONG LAKESHORE DRIVE TO ADDRESS #17887 LAKESHORE DRIVE; 50'± NW OF ABOVE ADDRESS; 32'± SW OF CENTER LINE OF LAKESHORE DRIVE, 7'± W OF PP #GT46349; 1'± S OF SURVEY MARKER POST.
ELEVATION: 1264.84

MARK	DATE	INITIAL	DESCRIPTION	REC	APPR	DATE
		EOR	REVISION			

SB&O INC.
PLANNING ENGINEERING SURVEYING
41689 Enterprise Circle North, Suite 126
Temecula, Ca. 92590
951-695-8900
951-695-8901 Fax

SCALE: 1"=40'
DATE: 2/27/2019

TENTATIVE PARCEL MAP No. 37710
CITY OF LAKE ELSINORE
SCHEDULE 'A'
FOR: PENNINGTON INDUSTRIAL LLC

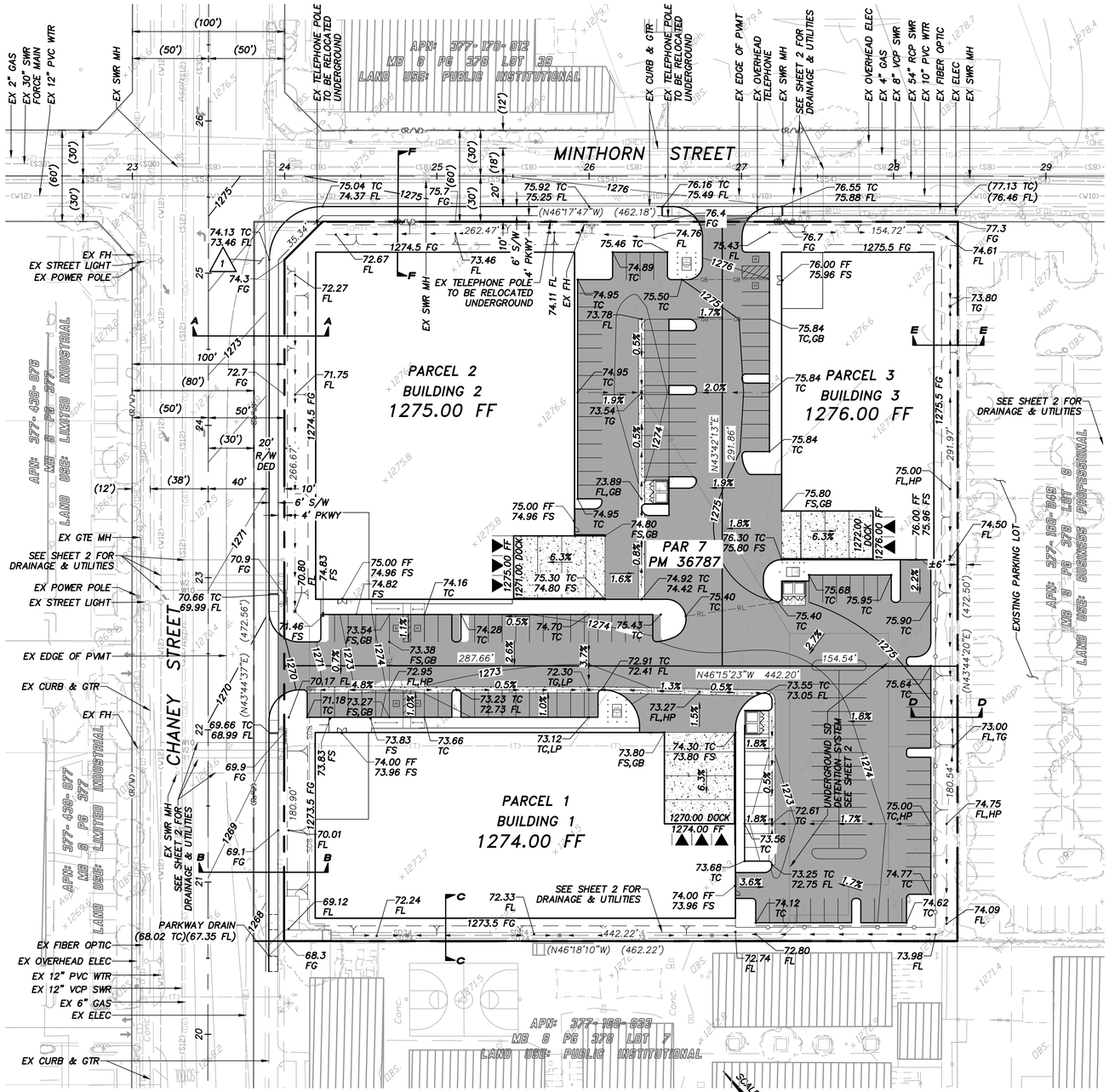
SHEET NO. 1 OF 1
FILE NO.

I:\74422 Pennington Industrial\Dwg\C-74422-TPM.dwg Feb 27, 2019 - 5:46pm

PENNINGTON INDUSTRIAL PARK

PRELIMINARY GRADING AND DRAINAGE PLAN

CITY OF LAKE ELSINORE



LEGEND

- (R/W) — EXISTING RIGHT-OF-WAY
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- PROPOSED BOUNDARY LINE
- PROPOSED PROPERTY LINE
- STREET CENTERLINE
- EXISTING CURB & GUTTER
- EXISTING SIDEWALK
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- DIRECTION OF DRAINAGE
- PROPOSED SLOPE
- PROPOSED CURB/CURB & GUTTER
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- EXISTING VALVE
- EXISTING ARROW / STRAIGHT
- EXISTING ARROW / TURNS
- EXISTING ARROWS / TURNS
- EXISTING TRAFFIC PAINT
- EXISTING TRAFFIC PAINT
- ASPHALT PVMT
- CONCRETE PVMT
- LANDSCAPING

EXIT STOP
HEID ONLY HERE

ENGINEER

SB&O INC.
41689 ENTERPRISE CIRCLE, STE 126
TEMECULA, CA 92590
ATTN: DON BROOKS
PHONE: 951-695-8900

OWNER/DEVELOPER

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SOURCE OF TOPOGRAPHY

INLAND AERIAL SURVEYS, INC.
FLIGHT DATE: 11-01-18, CONTOUR INTERVAL = 1 FOOT

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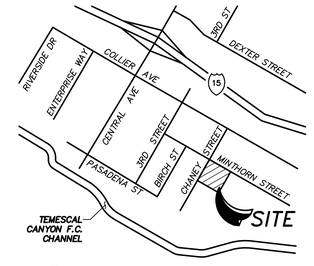
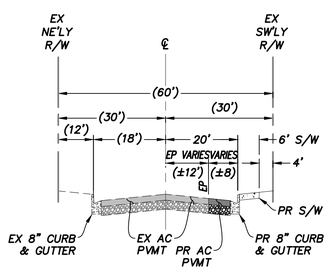


VICINITY MAP

THOMAS BROS. PAGE 866
GRID D3



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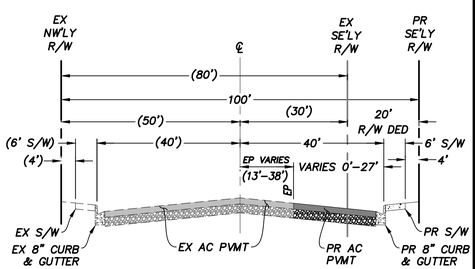

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ELEVATION: 1264.84

GRAPHIC SCALE
40' 0 40' 80' 120'

MARK	DATE	INITIAL	DESCRIPTION	REC	APPR	DATE
		EOR	REVISION			

SB&O INC.
PLANNING ENGINEERING SURVEYING
41689 Enterprise Circle North, Suite 126
Temecula, Ca. 92590
951-695-8900
951-695-8901 Fax

SCALE: 1"=40'
DATE: 2/27/2019

PRELIMINARY GRADING AND DRAINAGE PLAN
CITY OF LAKE ELSINORE
FOR TPM 37710

FOR: PENNINGTON INDUSTRIAL LLC

SHEET NO. 1 OF 2
FILE NO.

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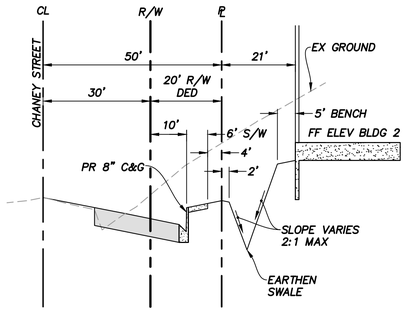

SECTION A-A

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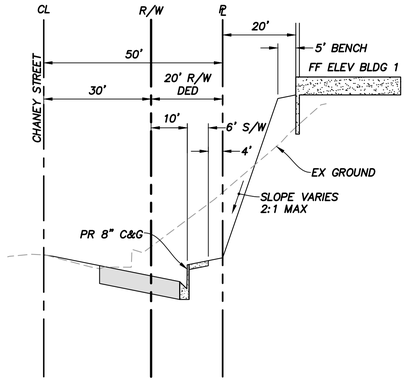

SECTION B-B

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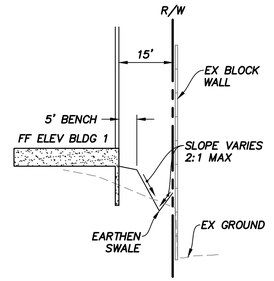

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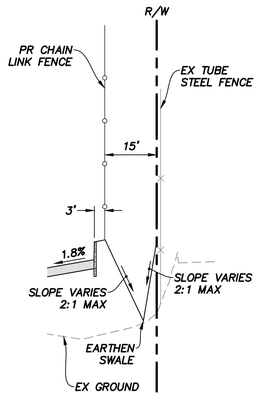

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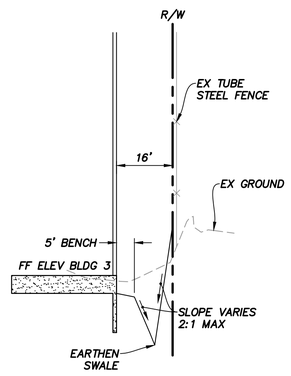

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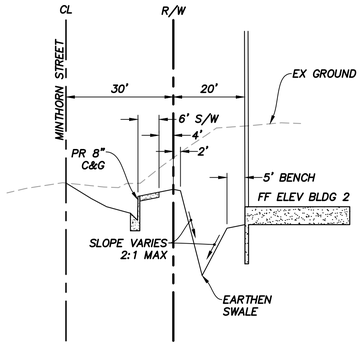

SECTION F-F

SCALE: 1"=20'(H.); 1"=2'(V.)

MARK	DATE	INITIAL	DESCRIPTION	REC	APPR	DATE
		EOR	REVISION			

SB&O INC.
PLANNING ENGINEERING SURVEYING
41689 Enterprise Circle North, Suite 126
Temecula, Ca. 92590
951-695-8900
951-695-8901 Fax

SCALE: 1"=40'

DATE: 2/27/2019

PRELIMINARY GRADING AND DRAINAGE PLAN

CITY OF LAKE ELSINORE

FOR TPM 37710

FOR: PENNINGTON INDUSTRIAL LLC

SHEET NO. 2

OF 2

FILE NO.

Appendix 3: Soils Information

NRCS Soils Report and Geotechnical Study

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

Pennington Industrial

January 8, 2019

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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 11, Sep 12, 2018

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

Date(s) aerial images were photographed: Feb 24, 2015—Feb 26, 2015

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
GaA	Garretson very fine sandy loam, 0 to 2 percent slopes	3.3	71.1%
GdC	Garretson gravelly very fine sandy loam, 2 to 8 percent slopes	1.3	28.9%
Totals for Area of Interest		**4.6**	**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

GaA—Garretson very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hcv1
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: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
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 storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: LOAMY (1975) (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

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

Map Unit Setting

National map unit symbol: hcv5
Elevation: 50 to 3,000 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 350 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: gravelly very fine sandy loam
H2 - 10 to 53 inches: gravelly loam
H3 - 53 to 72 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

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

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

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

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PRELIMINARY GEOTECHNICAL INTERPRETIVE REPORT

PROPOSED COMMERCIAL DEVELOPMENT
ASSESSOR'S PARCEL NUMBER 377-160-014
SOUTH CORNER OF CHANEY & WEST MINTHORN STREETS
CITY OF LAKE ELSINORE
RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO. 18679-10
FEBRUARY 27, 2019

CW SOILS
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▫ 951-304-3935 ▫
▫ cwsoils.com ▫

February 27, 2019

Project No. 18679-10

Mr. Rod Oshita
1601 North Sepulveda Boulevard, #401
Manhattan Beach, CA 90266

Subject: **Preliminary Geotechnical Interpretive Report, Proposed Commercial Development, Assessor's Parcel Number 377-160-014, South Corner of Chaney & West Minthorn Streets, City of Lake Elsinore, Riverside County, California**

In accordance with your request, CW Soils is pleased to present our preliminary geotechnical interpretive report for the proposed Commercial Development, Assessor's Parcel Number 377-160-014, located on the south corner of Chaney Street and West Minthorn Street in the City of Lake Elsinore, Riverside County, California. Our services were completed in accordance with the scope of work described in our proposal, dated March 23, 2018. The purpose of our work was to evaluate the nature, distribution, and engineering properties of the geologic formations underlying the site with respect to the proposed improvements.

CW Soils appreciates the opportunity to offer our services on this project. If we can be of further assistance, please do not hesitate to contact the undersigned at your convenience.

Respectfully submitted,

CW Soils

Chad E. Welke, PG, CEG, PE
Principal Geologist/Engineer

REGISTERED PROFESSIONAL ENGINEER
CHAD E. WELKE
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CHAD E. WELKE
NO. 2378
STATE OF CALIFORNIA

Distribution: (4) Addressee

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Attachments:

INTRODUCTION

This report prepared by CW Soils, presents the preliminary interpretive geotechnical evaluation for the proposed improvements. The purpose of our work was to evaluate the nature, distribution, and engineering properties of the geologic formations underlying the site with respect to the proposed improvements. Furthermore, we have included grading and foundation design recommendations based on the information you provided.

SITE DESCRIPTION

The site is located on the south corner of Chaney Street and West Minthorn Street in the City of Lake Elsinore, Riverside County, California. The subject property is surrounded by commercial developments and a school. The general location of the subject property is illustrated on Figure 1 – Vicinity Map.

The subject property consists of undeveloped land with relatively flat terrain. Topographic relief at the subject property is relatively low. Vegetation at the site includes sparse amounts of annual weeds/grasses, along with some small to large trees near the perimeters.

PROPOSED DEVELOPMENT

Based on our understanding of the proposed project, three (3) buildings positioned throughout the site are planned. The proposed commercial development is anticipated to consist of wood, concrete, or steel framed one- and/or two-story structures utilizing slab on grade construction with associated streets, landscape areas, and utilities.

Formal plans have not been prepared and await the conclusions and recommendations of this report.

FIELD EXPLORATION AND LABORATORY TESTING

Field Exploration

Subsurface exploration at the subject property was performed on April 12, 2018. A truck mounted hollow-stem-auger drill rig was mobilized to advance six (6) borings throughout the project area to a maximum depth of 50.5 feet.

Classification and logging of the soils encountered during the field exploration were performed in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Earth material descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487 or re-examination in the laboratory. Descriptive logs and the Log Symbols & Terms explanation sheet are presented in Appendix B.

REFERENCE: Google Earth (Version 7.1.2.2041) [Software]. Mountain View, CA: Google Inc. (2013).

CW SOILS	VICINTY MAP	14396-10 Not to Scale FIGURE 1

Associated with the subsurface exploration was the collection of disturbed bulk samples and/or relatively undisturbed samples of soils for laboratory testing and analysis. Relatively undisturbed samples were obtained with a 3.0 inch outside diameter (2.43 inch inside diameter) modified California split-spoon sampler lined with 1 inch high brass rings. A Standard Penetration Test (N) split-spoon sampler was utilized to obtain penetration resistance and samples as needed. Samples obtained using a hollow stem auger drill rig, were mechanically driven with successive 30 inch drops of a 140-pound automatic trip safety hammer. The blow counts required to drive the sampler the final 12 inches of an 18 inch drive were recorded in the boring logs. The deepest recovered portion of the driven samples were placed in sealed containers and transported to the laboratory for testing and analysis. The exploratory locations and geologic conditions at the subject property are illustrated on Plate 1 – Geotechnical Map.

Laboratory Testing

Maximum dry density/optimum moisture content, expansion potential, pH, resistivity, sulfate content, chloride content, and in-situ density/moisture content were determined for selected samples of soils, considered representative of those noted during the field exploration. The laboratory test results are reflected throughout the Conclusions and Recommendations of this report. Summaries of the test results and brief descriptions of laboratory test criteria are presented in Appendix C.

FINDINGS

Regional Geology

Regionally, the project is located in the Peninsular Ranges Geomorphic Province of California. The Peninsular Ranges are characterized by northwest trending sediment filled elongated valleys divided by steep mountain ranges. Associated with and subparallel to the northwest trending San Andreas Fault, are the San Jacinto Fault, Newport-Inglewood Fault, and the Whittier-Elsinore Fault zones. The northwest trend of the province has played a major role in shaping the dominant structural geologic features in the region as well. The Perris Block forms the eastern boundary of the Elsinore Fault, while the west side is comprised of the Santa Ana Mountains. The Perris Block is in turn bounded to the east by the San Jacinto Fault. The Peninsular Ranges Province and the Transverse Range Province are separated by the northern perimeter of the Los Angeles basin, which is formed by a northerly dipping blind thrust fault.

The low lying areas within the Peninsular Ranges Province are principally made up of Tertiary and Quaternary non-marine alluvial sediments consisting of alluvial deposits, sandstones, claystones, siltstones, conglomerates, and occasional volcanic units. The mountainous regions are primarily made up of Pre-Cretaceous, metasedimentary, and metavolcanic rocks along with Cretaceous plutonic rocks of the Southern California Batholith. A map illustrating the regional geology is presented on Figure 2 – Regional Geologic Map.

Local Geology

The most relevant local geologic units expected to be present at the site are summarized in this section. A general description of the dominant soils that form the geologic units is provided below:

- Artificial Fill, Undocumented (map symbol Afu): Undocumented artificial fill materials were encountered throughout the site within the upper 3 to 7 feet during exploration. These materials are typically locally derived from the native materials and consist generally of light brown to dark brown sandy clay and clayey

sand in a slightly moist to moist, and soft to medium stiff state. These materials are generally inconsistent, poorly consolidated fills.

- Quaternary Alluvium (map symbol Qal): Quaternary alluvium was encountered to a maximum depth of 50 feet. These alluvial deposits consist predominately of interlayered moderate yellowish brown to grayish brown, fine to coarse grained silty sand, clayey sand, sandy clay, sandy silt, and occasional clay. These deposits were generally noted to be in a slightly moist to wet, loose to very dense state.

- Cretaceous Heterogeneous Granitic Rocks (map symbol Khg): Cretaceous age granitic rocks composed of a wide variety of compositions make up this unit. Rock types typically include monzogranite, granodiorite, tonalite and gabbro, with the most common being tonalite (Morton, 2004). This rock unit was encountered at depth below the site. These granitic rocks were observed to be yellowish brown and in a moderately hard to hard state.

Aerial Photographs

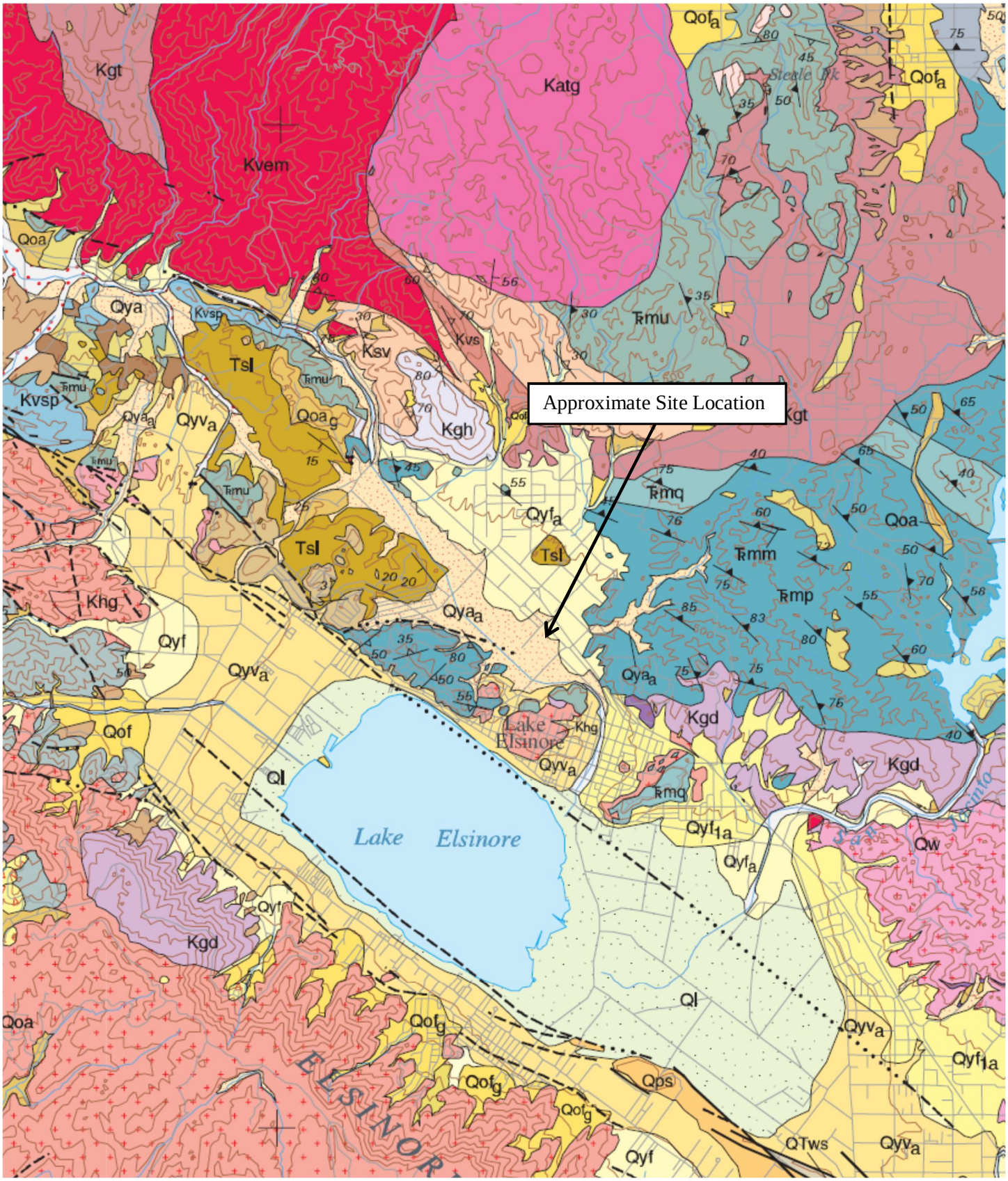
A review of aerial photographs was performed during our geotechnical evaluation. No strong geomorphic expressions suggestive of recent faulting, such as linear topography, offset streams/drainage courses, lines of natural springs, or fault scarps, were interpreted to project through the proposed project area during our review of the aerial photographs of the subject property. Aerial photographs from different time periods and various scales that were utilized in our geomorphic interpretations include the following from Google Earth dated May 1994, May 2002, October 2005, June 2009, June 2012, April 2014, and February 2018.

Faulting

Significant ground shaking will likely impact the site within the design life of the proposed project, due to the project being located in a seismically active region. The geologic structure of the entire southern California area is dominated by northwest-trending faults associated with the San Andreas Fault system. The San Andreas Fault system accommodates for most of the right lateral movement associated with the relative motion between the Pacific and North American tectonic plates.

The subject property is not located within an Alquist-Priolo Fault Rupture Hazard Study Zone, established by the State of California to restrict the construction of habitable structures across identifiable traces of known active faults. No active faults are known to project through the proposed project. As defined by the State of California, an active fault has undergone surface displacement within the past 11,700 years or during the Holocene epoch.

Based upon our understanding of the site and our analysis using the referenced software (USGS Earthquake Hazards Program, Unified Hazard Tool for Conterminous U.S. 2014 (v4.1.1) Deaggregation), the Elsinore Fault with an approximate source to site distance of 2.69 kilometers is the closest known active fault anticipated to produce the highest horizontal ground accelerations, having an estimated maximum modal magnitude of 7.36.



Reference: Morton, D.M., Hauser, Rachel M., and Ruppert, Kelly R., 2004, *Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California, Version 2.0*: U.S. Geological Survey Open-File Report 99-0172

CW SOILS	REGIONAL GEOLOGIC MAP	14396-10 Not to Scale FIGURE 2

CONCLUSIONS AND RECOMMENDATIONS

General

From a geotechnical point of view, the subject property is considered suitable for the proposed improvements, provided the design information and conclusions and recommendations herein are incorporated into the plans and are implemented during construction.

Geologic and soils engineering issues requiring special attention during planning and construction include temporary excavations near property lines. Recommended removals are on the order of 16 to 20 feet deep, and as a result the excavations should extend beyond the proposed building perimeters an equivalent horizontal distance. As such, we recommend the buildings be moved away from the property lines or costly shoring will be necessary.

Additionally, two layers of Tensar TX 160 or equivalent should be placed within the compacted fill at approximately 10 and 12 feet below grade. The conclusions and recommendations provided herein have been developed through diligent methodology to help mitigate potential geologic and soils engineering issues affecting the proposed improvements.

The site soils have significant clay content with MEDIUM expansion potential and therefore stormwater should not purposely or accidentally be introduced into subgrade soils proximate to building foundations or other surface improvements.

Earthwork

Grading Operations

Grading operations are subject to the provisions of the 2016 California Building Code (CBC), including Appendix J Grading, as well as all applicable grading codes and requirements of the appropriate reviewing agency. Grading operations should also be conducted in accordance with applicable requirements of our General Earthwork and Grading Specifications within the final appendix of this report, unless more conservative recommendations are provided herein.

Clearing and Grubbing

Areas undergoing grading operations should be stripped of vegetation including trees, grasses, weeds, brush, shrubs, or any other debris and properly disposed of offsite. Laborers should be employed to remove roots, branches, or other deleterious materials during grading operations.

CW Soils should be notified in a timely manner in order to provide observations during Clearing and Grubbing operations. Any buried foundations or unanticipated conditions should be brought to our immediate attention to consider whether adjustments are necessary.

Excavation Characteristics

Based on our experience with similar projects in similar settings, the near surface soils, will be readily excavated with conventional earth moving equipment appropriately selected for the task to be performed.

Groundwater

Groundwater was observed in Borings 1, 2, and 5 at depths ranging from 19.5 to 23 feet below existing grade. It should be noted that localized groundwater or variations in the level of groundwater could be discovered during grading due to the limited number of exploratory locations or other factors.

Based on experience working in the area of the subject project, which includes design and construction of the local Target Building (groundwater approximately 5-7 feet), Fairway commercial properties (groundwater approximately 7-10 feet), borings on a project (C.W. Soils, 2015) approximately 400 feet away (groundwater approximately 15.5-18 feet), and the current groundwater level at the site (groundwater approximately 19.5-23 feet). Our best interpretation of this data is that the historic groundwater at the site would have likely fluctuated into the less than 10-foot deep range.

Ground Preparation

Removal excavations should be verified by the project engineer, geologist or their representative. Prior to placing compacted fills, the exposed bottom should be scarified to a depth of 6 inches or more, watered or air dried as necessary to achieve near optimum moisture content and then compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557-12.

Remedial grading should extend horizontally beyond the perimeter of the proposed structures a distance equal to the depth of compacted fill below the proposed footing or a minimum of 5 feet, whichever is greater. The anticipated removal depths are shown on Plate 1 – Geotechnical Map. In general the anticipated removal depths should vary from 16 to 20 feet below existing grade.

Additionally, two layers of Tensar TX 160 or equivalent should be placed within the compacted fill at approximately 10 and 12 feet below grade. The conclusions and recommendations provided herein have been developed through diligent methodology to help mitigate potential geologic and soils engineering issues affecting the proposed improvements.

Wet Removals

Should removals of wet alluvial soils be required, special grading equipment and procedures can reduce overall costs. Careful planning by an experienced grading contractor can minimize the need for special equipment, such as swamp cats, draglines, excavators, pumps, and top loading earthmovers. Possible methods of obtaining bottom stabilization may include the placement of imported angular rock and/or geotextile ground reinforcement. Areas should be set aside for drying and mixing of wet materials with dry materials to reduce the moisture content prior to placing as compacted fill. Specific recommendations can be provided based on the actual conditions encountered.

Oversize Rock

Minor quantities of oversize rock (i.e., rock exceeding a maximum dimension of 12 inches) are expected to be encountered during grading. Oversize rock that is encountered should be disposed of offsite, dispersed throughout the site at the surface of natural grades, or stockpiled and crushed for future use. The disposal of oversize rock is discussed in greater detail in the last appendix of this report, General Earthwork and Grading Specifications.

Compacted Fill Placement

Well mixed soils should be placed in 6 to 8 inch maximum (uncompacted) lifts, watered or air dried as necessary to achieve uniform near optimum moisture content and then compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557-12.

Import Soils

If needed to achieve final design grades, all potential import materials should be non-expansive, free of deleterious/oversize materials, and approved by the project soils engineering consultant prior to delivery onsite.

Fill Slopes

Fill slopes higher than 5 feet and steeper than 5:1 (h:v) require a keyway at the toe. Keyways should be excavated 2 feet into competent earth materials, as measured on the downhill side and be a minimum of 10 feet wide. Backcuts for keyway excavations should be cut no steeper than 1:1 or as recommended by the soils engineer or engineering geologist. As compacted fill is placed, proper benching into competent earth materials should be maintained.

Temporary Backcuts

With regard to excavation safety, it is the responsibility of the grading contractor to follow all Cal-OSHA requirements. Adequate slope stability to protect adjacent developments must be maintained, temporary backcuts for canyon removals, stabilization fills, and/or keyways may be needed. It is imperative that grading schedules minimize the exposure time of the unsupported excavations. Temporary backcuts should be observed by the engineering geologist or his representative during grading/construction operations.

Temporary Shoring

Temporary vertical excavations removing support from adjacent properties will require the use of temporary shoring. Shoring recommendations may be provided upon request under a separate scope of work.

Geotechnical Observations

Clearing operations, removal of unsuitable materials, and general grading procedures should be observed by the project soils consultant or his representative. Compacted fill should not be placed without prior bottom observations being conducted by the soils consultant or his representative to verify the adequacy of the removals.

The project soils consultant or his representative should be present to observe grading operations and to check that the minimum compaction requirements are being obtained. In addition, verification of compliance with the other grading recommendations presented herein should be provided concurrently.

Post Grading Considerations

Slope Landscaping and Maintenance

Provided all drainage provisions are properly constructed and maintained, the gross stability of graded slopes should not be adversely affected. However, satisfactory slope and building pad drainage is essential for the long term performance of the site. Concentrated drainage should not be allowed to flow uncontrolled over any descending slope. As recommended by the project landscape architect, engineered slopes should be landscaped with deep rooted, drought tolerant maintenance free plant species.

Site Drainage

Maintaining control over drainage throughout the site is important for the long term performance of the proposed improvements. We recommend roof gutters or equivalent roof collection system for proposed structures. Pad and roof drainage should be routed in non-erosive drainage devices to driveways, adjacent streets, storm-drain facilities, or other locations approved by the building official. Drainage should not be allowed to pond on the building pad or near any foundations. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Planters located next to structures should be sealed to the depth of the footings. Drainage control devices require periodic cleaning, testing and maintenance to remain effective.

Building pad drainage should be designed to meet the minimum gradient requirements of the CBC, to divert water away from foundations.

Utility Trenches

All utility trench backfill should be compacted at near optimum moisture to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557-12. Trench backfill should be placed in approximately 6 to 8 inch maximum loose lifts and then mechanically compacted with a hydro-hammer, a sheepsfoot, pneumatic tampers, or similar equipment. Within pavement areas, the upper 6 inches of subgrade materials for utility trench backfill should be compacted to 95 percent of the maximum dry density determined by ASTM D1557-12. The utility trench backfill should be observed and tested by the project soils engineer or their representative to verify that the minimum compaction requirements have been obtained.

Where utility trenches undercut perimeter foundations, all utility trenches should be backfilled with compacted fill, lean concrete, or concrete slurry. When practical, interior or exterior utility trenches that run parallel to structure footings should not be located within a 1:1 (h:v) plane projected downward from the outside bottom edge of the footing.

SEISMIC DESIGN PARAMETERS

Ground Motions

To resist the effects of design level seismic ground motions in order to prevent collapse (1% probability of collapse in 50 years), structures are required to be designed and constructed in accordance with the 2016 California Building Code Section 1613. The design is reliant on the site class, risk category (I, II, III, or IV), and mapped spectral accelerations for short periods (S_s) and a 1-second period (S_1).

Based on data and maps jointly compiled by the United States Geological Survey (USGS) and the California Geological Survey (CGS), spectral accelerations for the subject property were generated via a software application provided by the USGS website, *Earthquake Hazards Program*. The data summarized in the following table is based on the Maximum Considered Earthquake Geometric Mean (MCE_G) with 5% damped ground motions having a 2% probability of being exceeded in 50 years (2,475 year return period).

The seismic design parameters were determined by a combination of the site class, mapped spectral accelerations, on site soil/rock conditions, and risk category. The compilation of seismic design parameters found below are considered appropriate for implementation during structural design. The USGS Design Summary Report is included in Appendix D.

PARAMETER		FACTOR
Site Location		Latitude: 33.6832 Longitude: -117.3343
Site Class (1613.3.2 of 2016 CBC, Chapter 20 of ASCE 7)		D
Mapped Spectral Accelerations for short periods	S_s (g)	2.298
Mapped Spectral Accelerations for 1-Second Period	S_1 (g)	0.919
Maximum Considered Earthquake Spectral Response Acceleration for Short Periods	S_{ms} (g)	2.068
Maximum Considered Earthquake Spectral Response Acceleration for 1-Second Period	S_{m1} (g)	2.206
Design Spectral Response Acceleration for Short Periods	S_{DS} (g)	1.379
Design Spectral Response Acceleration for 1-Second Period	S_{D1} (g)	1.470
Seismic Design Category		E
Importance Factor Based on Occupancy Category		II

A probabilistic seismic hazard assessment for the site was conducted in accordance with the 2016 CBC, Section 1803.5.12. The probabilistic seismic hazard maps and data files were jointly prepared by the United States Geological Survey (USGS) and the California Geological Survey (CGS). Actual ground shaking intensities at the subject property may be substantially higher or lower based on complex variables such as the near source directivity effects, depth and consistency of soils, topography, geologic structure, direction of fault rupture, seismic wave reflection, refraction, and attenuation rates. The estimated probabilistic peak ground acceleration at the site is, PGA = 0.901. The anticipated horizontal ground acceleration for evaluating the potential for liquefaction at the site during the design earthquake event is 0.811 g ($PGA_M = F_{PGA}$ PGA, per the 2016 CBC Section 1803.5.12).

Secondary Seismic Hazards

Secondary effects of seismic shaking include several types of ground failure as well as induced flooding. Ground failure that could occur as a consequence of severe ground shaking, include landslides, ground lurching, shallow ground rupture, and liquefaction/lateral spreading. The likelihood of occurrence of each type of ground failure depends on the severity and distance from the earthquake epicenter, topography, geologic structure, groundwater conditions, and other factors. All of the secondary effects of seismic activity listed above are considered to be unlikely, based on our experience, subsurface exploration, and laboratory testing.

Seismically induced flooding is normally associated with a tsunami (seismic sea wave), a seiche (i.e., a wave-like oscillation of surface water in an enclosed basin that may be initiated by a strong earthquake) or failure of a major reservoir or retention system up gradient of the site. As a result of the site being at an elevation of more than 1,000 feet above mean sea level and being more than 20 miles inland from the nearest coastline of the Pacific Ocean, the potential for seismically induced flooding due to a tsunamis is considered remote. The likelihood of induced flooding due to a seiche overcoming a dam's freeboard is considered remote. In addition, it is considered remote that any major reservoir up gradient of the subject property would be compromised to a point of failure.

Liquefaction and Lateral Spreading

The three requirements for liquefaction to occur include seismic shaking, poorly consolidated cohesionless sands, and groundwater. Liquefaction results in a substantial loss of shear strength in loose, saturated, cohesionless soils subjected to earthquake induced ground shaking. Potential impacts from liquefaction include loss of bearing capacity, liquefaction related settlement, lateral movements, and surface manifestation in the form of sand boils. The potential for design level earthquake induced liquefaction and lateral spreading to occur beneath the proposed structures is considered very low to remote due to the recommended compacted fill and the dense nature of the deeper onsite soils.

We have provided liquefaction analyses that model the existing ungraded conditions and recommended graded conditions, using a groundwater level of 5 feet to represent a conservative historic high groundwater level. The analyses of the post graded conditions revealed that potentially liquefiable soils were encountered in boring B-2, from 14 to 19 feet. Our analyses were performed utilizing the guidelines of *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* (SCEC, 1999) and *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, California Geological Survey, Special Publication 117A 2008. Based on our calculations, we estimate that dynamic settlement of sands due to liquefaction will be on the order of 1.7 inches in the vicinity of Boring B-2 prior to performing the recommended grading improvements. Upon completion of the recommended grading improvements we estimate that dynamic settlement of sands due to liquefaction will be on the order of 0 inches in the vicinity of Boring B-2. The liquefaction potential and dynamic settlement of sands calculations can be found in Appendix E.

Ground Subsidence

Groundwater or oil withdrawal from soils can cause a permanent collapse of pore space previously occupied by the fluid. The consolidation of subsurface sediments resulting from fluid withdrawal may cause the ground surface to subside, potentially resulting in differential subsidence which can significantly damage engineered structures. Since excessive withdrawal of fluids is not anticipated in the vicinity of the proposed project, the potential for subsidence is considered low to remote.

PRELIMINARY FOUNDATION DESIGN RECOMMENDATIONS

General

Shallow foundations are considered feasible for support of the proposed structures, provided grading and construction are performed in accordance with the recommendations of this report. Foundation recommendations are provided in the following sections. Graphic presentations of relevant information and recommendations are also included on Plate 1 – Geotechnical Map.

Allowable Bearing Values

An allowable bearing value of 1,500 pounds per square foot (psf) is recommended for design of 12 inch wide continuous footings founded at a minimum depth of 12 inches below the lowest adjacent final grade and 24 inch square pad footings. This value may be increased by 20 percent for each additional 1-foot of width and/or depth to a maximum value of 2,000 psf. Recommended allowable bearing values include both dead and frequently applied live loads and may be increased by one third when designing for short duration wind or seismic forces.

Settlement

We estimate that the maximum total settlement of the footings will be less than approximately ¾ inch, based on the anticipated loading and the settlement characteristics of the underling earth materials. Differential settlement is expected to be about ½ inch over a horizontal distance of approximately 20 feet, for an angular distortion ratio of 1:480. The majority of the settlement is anticipated to occur during construction or shortly after the initial application of loading.

The above settlement estimates are based on the assumption that the grading and construction are performed in accordance with the recommendations presented in this report. Additionally, the project soils consultant or his representative will be provided the opportunity to observe the foundation excavations.

Lateral Resistance

Passive earth pressure of 200 psf per foot of depth to a maximum value of 2,000 psf may be used to establish lateral bearing resistance for footings. A coefficient of friction of 0.30 times the dead load forces may be used between concrete and the supporting soils to determine lateral sliding resistance. When combining passive and friction for lateral resistance, the passive component should be reduced by one third. In no case shall the lateral sliding resistance exceed one-half the dead load for clay, sandy clay, sandy silty clay, silty clay, and clayey silt.

The above lateral resistance values are based on footings for an entire structure being placed directly against compacted fill.

Expansive Soil Considerations

The preliminary laboratory test results indicate that the onsite soils exhibit an expansion potential of **MEDIUM** as classified by the 2016 CBC Section 1803.5.3 and ASTM D4829-03.

Additional, testing for expansive soil conditions should be conducted upon completion of rough grading and prior to construction. The following recommendations should be considered the very minimum requirements, for the soils tested. It is common practice for the project architect or structural engineer to require additional slab thickness, footing sizes, and/or reinforcement.

Medium Expansion Potential (Expansion Index of 51 to 90)

Our laboratory test results indicate that the soils onsite exhibit a **MEDIUM** expansion potential as classified by the 2016 CBC Section 1803.5.3 and ASTM D4829-03. As such, the CBC specifies that slab on grade foundations (floor slabs) resting on soils with expansion indices greater than 20, require special design considerations per the 2016 CBC Sections 1808.6.1 and 1808.6.2. The design procedures incorporate the thickness and plasticity index of the various soils within the upper 15 feet of the proposed structure. We have assumed an effective plasticity index of 16, for preliminary design purposes.

Conventional Footings

- Exterior continuous footings should be founded at the minimum depths below the lowest adjacent final grade (i.e. minimum 18 inch depth for one-story and two-story, and minimum 24 inch depth for three-story construction). Interior continuous footings for one-, two-, and three-story construction may be founded at a minimum depth of 12 inches below the lowest adjacent final grade. In accordance with Table 1809.7 of the 2016 CBC, all continuous footings should have a minimum width of 12, 15, and 18 inches, for one-, two-, and three-story structures, respectively, and should be reinforced with a minimum of four (4) No. 4 bars, two (2) top and two (2) bottom.

- Exterior pad footings intended to support roof overhangs, such as second story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. The pad footings should be reinforced with a minimum of No. 4 bars spaced a maximum of 18 inches on center, each way, and should be placed near the bottom-third of the footings.

Building Floor Slabs

- Building floor slabs should be a minimum of 4 inches thick. All floor slabs should be reinforced with a minimum of No. 3 bars spaced a maximum of 18 inches on center, each way, supported by concrete chairs or bricks to ensure desired mid-depth placement. Based on an assumed effective plasticity index of 16, the project architect or structural engineer should evaluate minimum floor slab thickness and reinforcement in accordance with 2016 CBC Section 1808.6.2.

- Building floor slabs with moisture sensitive or occupied areas, should be underlain by a minimum 10-mil thick moisture barrier to help reduce the upward migration of moisture from the underlying soils. The moisture barrier should be properly installed using the guidelines of ACI publication 318-05 and meet the performance standards of ASTM E 1745 Class A material. Prior to placing concrete, it is the responsibility of the contractor to ensure that the moisture barrier is properly placed and free of openings, rips, or punctures. As an option for additional moisture protection and foundation strength, higher strength concrete, such as a minimum compressive strength of 5,000 pounds per square inch (psi) in 28-days may be used. In addition, a capillary break/vapor retarder for concrete slabs should be provided in accordance with CALGreen. Ultimately, the design of the moisture barrier system along with recommendations for concrete placement and curing are the purview of the foundation engineer, factoring in the project conditions provided by the architect and owner.

- Garage floor slabs should be a minimum of 5 inches thick and should be reinforced in a similar manner as living area floor slabs. Garage floor slabs should be placed separately from adjacent wall footings with a positive separation maintained with ⅜ inch minimum felt expansion joint materials and quartered with weakened plane joints. A 12 inch wide turn down founded at the same depth as adjacent footings should be provided across garage entrances. The turn down should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- Prior to placing concrete, the subgrade soils below all floor slabs should be pre-watered to achieve a moisture content at least 1.1 times optimum. The moisture content should penetrate a minimum depth of 12 inches into the subgrade soils. The pre-watering should be verified and tested by CW Soils.

Post Tensioned Slab/Foundation Design Recommendations

In lieu of the proceeding foundation recommendations, post tensioned slabs may be used for the proposed structures. Post tension foundations are generally considered to be a better foundation system, but may be slightly higher in overall cost. The foundation engineer may design the post tensioned foundation system using the following Post Tensioned Foundation Slab Design table. These parameters have been provided in general accordance with Post Tensioned Design. Alternate designs addressing the effects of expansive soils are allowed per 2016 CBC Section 1808.6.2. When utilizing these parameters, the foundation engineer should design the foundation system in accordance with the allowable deflection criteria of applicable codes.

It should be noted that the post tensioned design methodology is partially based on the assumption that soils moisture changes around and underneath post tensioned slabs, are only influenced by climate conditions. With regard to expansive soils, moisture variations below slabs are the major factor in foundation damage. However, the design methodology does not take into account presaturation, owner irrigation, or other non-climate related influences on the moisture content of the subgrade soils. In recognition of these realities, we modified the soils parameters obtained from this methodology to help account for reasonable irrigation practices. Additionally, the slab subgrades should be presoaked to a depth of 12 inches and maintained at above optimum moisture until placing concrete. Furthermore, prior to placing concrete, the subgrade soils below all floor slabs and perimeter footings should be presoaked to achieve moisture contents at least 1.0, 1.1, 1.2, and 1.3 times optimum to depths of 6, 12, 18, and 24 inches for Low, Medium, High, and Very High expansion potential soils, respectively. The moisture content should penetrate to a minimum depth of 24 inches into the subgrade soils. The pre-watering should be verified and tested by CW Soils.

Ponding water near the foundation can significantly change the moisture content of the soils below the foundation, causing excessive foundation movement and detrimental effects. Our recommendations do not account for excessive irrigation and/or incorrect landscape designs. To prevent moisture infiltration below the foundation, planters placed adjacent to the foundation should be designed with an effective drainage system or liners. Some lifting of the perimeter foundation should be expected even with properly constructed planters.

Future owners should be informed and educated of the importance in maintaining a consistent level of moisture within the soils around structures. Potential negative consequences can result from either excessive watering or allowing expansive soils to become too dry. Expansive soils will shrink as they dry, followed by swelling during the rainy winter season or when irrigation is resumed, causing distress to site improvements.

Post Tensioned Foundation Slab Design

PARAMETER	VALUE
Expansion Index	Medium[1]
Percent Finer than 0.002 mm in the Fraction Passing the No. 200 Sieve	< 30 percent (assumed)
Clay Mineral Type	Montmorillonite (assumed)
Thornthwaite Moisture Index	-20
Depth to Constant Soil Suction	7 feet
Constant Soil Suction	P.F. 3.6
Moisture Velocity	0.7 inch/month
Center Lift Edge moisture variation distance, e_m Center lift, y_m	5.5 feet 2.5 inches
Edge Lift Edge moisture variation distance, e_m Edge lift, y_m	3.5 feet 1.0 inches
Soluble Sulfate Content for Design of Concrete Mixtures in Contact with Soils	Negligible
Modulus of Subgrade Reaction, k (assuming presaturation as indicated below)	120 pci
Minimum Perimeter Foundation Embedment	18
Perimeter Foundation Reinforcement	--
Under Slab Moisture Barrier and Sand Layer	10-mil thick moisture barrier meeting the requirements of a ASTM E 1745 Class A material

1. Assumed for design purposes or obtained by laboratory testing.
2. Recommendations for foundation reinforcement are ultimately the purview of the foundation/structural engineer based upon the soils criteria presented in this report and structural engineering considerations.

Structural Setbacks and Building Clearance

Structural setbacks are required by the 2016 California Building Code (CBC). No additional structural setbacks are required due to geologic or soils conditions within the site. Improvements constructed near natural or properly compacted engineered slopes can, over time, be affected by natural processes including gravity forces, shrink/swell processes, weathering, and long term secondary settlement. As a result, the CBC requires that structures be setback or footings deepened to resist the influence of these processes.

For structures that are planned near ascending and descending slopes, the footings should be embedded to satisfy the requirements presented in the 2016 CBC, Section 1808.7. Foundations are required to be founded in accordance with the Foundation Clearances from Slopes Detail (CBC, 2016), which is illustrated in the last Appendix of this report.

Foundation Observations

Prior to the placement of forms, concrete, or steel, all foundation excavations should be observed by the geologist, engineer, or his representative to verify that they have been excavated into competent bearing materials, in accordance with the 2016 CBC. The foundations should be excavated per the approved plans, moistened, cleaned of all loose materials, trimmed neat, level, and square. Moisture softened soils should be removed prior to steel

or concrete placement. Soils from foundation excavations should be removed from slab on grade areas, unless they have been properly compacted and tested.

Corrosivity

Corrosion is defined by the National Association of Corrosion Engineers (NACE) as "a deterioration of a substance or its properties because of a reaction with its environment." From a soils engineering point of view, the "substances" are the reinforced concrete foundations or buried metallic elements (not surrounded by concrete) and the "environment" is the prevailing soils in contact with them. Many factors can contribute to corrosivity, including the presence of chlorides, sulfates, salts, organic materials, different oxygen levels, poor drainage, varying soils consistencies, and moisture content. It is not considered practical or realistic to test for all of the factors which may contribute to corrosivity.

The level of chlorides considered to be significantly detrimental to concrete is based upon the industry recognized Caltrans standard "Bridge Design Specifications". Under subsection 8.22.1 of that document, Caltrans established that "Corrosive water or soil contains more than 500 parts per million (ppm) of chlorides". Based on limited testing, the onsite soils tested have chloride contents *less* than 500 ppm. Therefore, specific requirements resulting from elevated chloride contents are not required.

When the soluble sulfate content of soils exceeds 0.1 percent by weight, specific guidelines for concrete mix design are provided in the 2016 CBC Section 1904 and in ACI 318, Section 4.3 Table 4.3.1. Based on limited testing, the onsite soils are classified as having a *negligible* sulfate exposure condition, in accordance with Table 4.3.1. Therefore, structural concrete in contact with onsite soils should utilize Type I or II.

The onsite soils in contact with buried steel should be considered *moderately corrosive*, based on our laboratory testing of resistivity. Additionally, pH values below 9.7 are recognized as being corrosive to most common metallic components including, copper, steel, iron, and aluminum. The pH values for the soils tested were *lower* than 9.7. Therefore, any steel or metallic materials that are exposed to the soils should be encased in concrete or other remedies applied to provide corrosion protection.

For structures utilizing post tensioned systems, the post tensioning cables should be encased in concrete and/or encapsulated in accordance with the Post Tensioning Institute Guide Specifications. If post tensioning cable end plate anchors and nuts are exposed, they should also be protected. If the anchor plates and nuts are recessed into the edge of the concrete slab, the recess should be filled in with a non-shrink, non-porous, moisture-insensitive epoxy grout so that the anchorage assembly and the end of the cable are completely encased and isolated from the soils. A standard non-shrink, non-metallic cementatious grout may be used only when the post tension anchoring assembly is polyethylene encapsulated, similar to that offered by Hayes Industries, LTD or O'Strand, Inc.

It should be noted that CW Soils are not corrosion engineers and the test results for corrosivity are based on limited samples thought to be representative. The grading operations may blend various soils together and/or unveil soils with higher corrosive properties. This blending or imported material could alter and increase the detrimental properties of the onsite soils. Thus, it is important that additional testing near final grades for chlorides and sulfates along with testing for pH and resistivity be performed upon completion of the grading operations. Laboratory test results are presented in Appendix C.

RETAINING WALLS

Active and At-Rest Earth Pressures

Retaining wall foundations may be designed in accordance with the recommendations provided in the Preliminary Foundation Design Recommendation section of this report. For design of retaining walls up to 6 feet high, the table below provides the minimum recommended equivalent fluid pressures.

The active earth pressure should be used for design of unrestrained retaining walls, which are free to tilt slightly. The at-rest earth pressure should be used for design of retaining walls that are restrained at the top, such as basement walls, curved walls with no joints, or walls restrained at corners. For curved walls, active pressure may be used if tilting is acceptable and construction joints are provided at each angle point and at a minimum of 15 foot intervals along the curved segments.

MINIMUM STATIC EQUIVALENT FLUID PRESSURE (pcf, ≤*6 feet high)		
PRESSURE TYPE	BACKSLOPE CONDITION	
	LEVEL	2:1 (h:v)
Active Earth Pressure	45	75
At-Rest Earth Pressure	68	110

Hydrostatic pressure behind the retaining walls has not been taken into account when calculating the parameters provided. Therefore, the subdrain system is a very important part of the design. If additional loads are being applied within a 1:1 plane projected up from the heel of the retaining wall footing, due to surcharge loads imposed by other nearby walls, structures, vehicles, etc., then additional pressure should be added to the above earth pressures to account for the expected surcharge loads. In order to minimize surcharge loads and the settlement potential of nearby structures, the footings for the structure can be deepened below the 1:1 plane projected up from the heel of the retaining wall footing.

Upon request and under a separate scope of work, more detailed analyses can be provided to address retaining wall designs with regard to value engineering, stepped retaining walls, actual retaining wall heights, actual backfill inclinations, specific backfill materials, higher retaining walls requiring earthquake design motions, etc.

Subdrain System

To prevent the buildup of hydrostatic pressure behind the proposed retaining walls, we recommend a perforated pipe and gravel subdrain system be provided behind all retaining walls. The subdrain system should consist of 4 inch minimum diameter Schedule 40 PVC or ABS SDR-35 perforated pipe, placed with the perforations facing down. The pipe should be surrounded by a minimum of 1 cubic foot per foot of ¾- or 1½ inch open graded gravel wrapped in Mirafi 140N or equivalent filter fabric, to prevent infiltration of fines and subsequent clogging of the subdrain system.

In addition, the retaining walls should be adequately coated on the backfilled side of the walls with a proven waterproofing compound by an experienced professional to inhibit infiltration of moisture through the walls.

Temporary Excavations

All excavations should be made in accordance with Cal-OSHA requirements. CW Soils is not responsible for job site safety.

Retaining Wall Backfill

Retaining wall backfill materials should be approved by the soils engineer or his representative prior to placement as compacted fill. Retaining wall backfill should be placed in lifts no greater than 6 to 8 inches, watered or air dried as necessary to achieve near optimum moisture contents. All retaining wall backfill should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557. When practical, retaining wall backfill should be capped with a paved surface drain.

EXTERIOR CONCRETE

Subgrade Preparation

Subgrade soils underlying concrete flatwork should be compacted at near optimum moisture to a minimum of 90 percent of the maximum dry density as determined by ASTM test method D1557-12. Prior to placing concrete, the subgrade soils should be moistened to at least optimum or slightly above optimum moisture content (see table below). Pre-watering of the soils prior to placing concrete will promote uniform curing of the concrete and minimize the development of shrinkage cracks. The higher the expansion potential of the onsite soils the longer it will take to achieve the recommended presaturation. Therefore, the procedure and timing should be planned in advance.

Flatwork Design

Cracking within concrete flatwork is often a result of factors such as the use of too high of a water to cement ratio and/or inadequate steps taken to prevent moisture loss during the curing of the concrete. However, minor cracking within concrete flatwork is normal and should be expected. It should be noted that the reduction of slab cracking is often a function of proper slab design, concrete mix design, placement, curing, and finishing practices. We recommend the adherence to the guidelines of the American Concrete Institute (ACI).

When placed over expansive soils, exterior concrete elements are susceptible to lifting and cracking. When this occurs with highly expansive soils, the detrimental impacts can be significant and may necessitate the removal and replacement of the affected improvements. In order to reduce the potential for unsightly cracking, we suggest a combination of presaturation of the subgrade soils, reinforcement, restraint, and a layer of granular materials. Although these measures may not completely eliminate distress to concrete improvements, the application of these measures can significantly reduce the distress caused by expansive soils. The degree and extent the measures recommended in the following table are applied depend on:

- The expansion potential of the subgrade soils.
- The practicality of implementing the measures (such as presaturation).
- The benefits verse the economics of the measures.

The project owner should perform a cost/benefit analysis on the factors to determine the extent the measures will be applied to each project. The expansive potential of the onsite soils should be considered **MEDIUM**.

CONCRETE FLATWORK					
CONSTRUCTION DESIGN	EXPANSION INDEX				
	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH
Slab Thickness, Minimum	3.5 inches	3.5 inches	4.5 inches	4.5 inches	5 inches
Subbase, Gravel Layer	NA	NA	Optional	3 inches	4 inches
Presaturation, Relative to Optimum Moisture Content	Pre-wet NA	Optimum 6 inches Deep	1.1 x Optimum 12 inches Deep	1.2 x Optimum 18 inches Deep	1.3 x Optimum 24 inches Deep
Joint, Maximum Spacing, (joint to extend ¼ slab)	10 feet or less	10 feet or less	8 feet or less	6 feet or less	6 feet or less
Reinforcement, Mid-Depth	NA	NA	Optional (WWF 6 x 6 W1.4 x W1.4)	No. 3 Rebar 24" On Center Both Ways	No. 3 Rebar 24" On Center Both Ways
Restraint, Slip Dowels Mid-Depth	NA	NA	Optional	Across Cold Joints	Across Cold Joints

The use of a granular layer for exterior slabs is primarily intended to facilitate presaturation and subsequent construction operations by providing a working surface over the saturated soils and to help retain the moisture. Where these factors are insignificant, the layer may be omitted.

PRELIMINARY PAVEMENT DESIGN

An assumed R-value of 10 may be used for preliminary pavement design. Calculated in accordance with the State of California design procedures using assumed Traffic Indices, the following table summarizes the minimum recommended asphalt concrete pavement sections. Final pavement design should be based on sampling and testing of post grading conditions. Alternative, but equivalent pavement sections and calculation sheets have been provided within the appendices of this report.

ASPHALT CONCRETE PAVEMENT DESIGN			
PARAMETERS	AUTO PARKING	AUTO DRIVES	ENTRANCES/TRUCK DRIVES
Assumed Traffic Index	4.0	5.0	6.0
Preliminary Design R-Value	10	10	10
AC Thickness (inches)	3	3	3½
AB Thickness (inches)	5	9	11.5

Note: AC – Asphalt Concrete
AB – Aggregate Base

The following table includes the minimum recommended Portland cement concrete pavement design sections calculated using the guidelines of the State of California design procedures.

PORTLAND CEMENT CONCRETE PAVEMENT DESIGN			
Street Type	Preliminary Design R-Value	Traffic Index	Pavement Section (inches)
ENTRANCES/TRUCK DRIVES	10	6.0	6 PCC over 10 AB

Note: PCC – Portland Cement Concrete
AB – Aggregate Base

The minimum requirements for the Portland cement concrete shall be a six sack mix and 3,500 pounds per square inch at 28 days.

The subgrade soils immediately below the aggregate base (base) should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557 to a minimum depth of 12 inches. Base materials should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557.

Base materials should consist of Class 2 aggregate base conforming to Section 26-1.02B of the State of California Standard Specifications or crushed aggregate base conforming to Section 200-2 of the Standard Specifications for Public Works Construction (Greenbook). Base materials should be compacted at or slightly below optimum moisture content. Asphalt concrete materials and construction operations should conform to Section 203 of the Greenbook.

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **Mr. Rod Oshita** and their authorized representative. It is unlikely to contain sufficient information for other parties or other uses. CW Soils should be provided the opportunity to review the final design plans and specifications prior to construction, in order to verify that the recommendations have been properly incorporated into the project plans and specifications. If CW Soils is not accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.

We recommend that CW Soils be retained to provide soils engineering and engineering geologic services during the grading and foundation excavation phases of work, in order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

CW Soils should review any changes in the project and modify the conclusions and recommendations of this report in writing. This report along with the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions during grading or construction operations appear to differ from those indicated in this report, our office should be notified immediately, as appropriate revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Soils vary in type, strength, and other engineering properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the proposed project. No practical study can completely eliminate uncertainty with regard to the anticipated geologic and soils engineering conditions in connection with a proposed project. The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by CW Soils based on the conditions revealed during grading and construction operations.

This report was prepared with the understanding that it is the responsibility of the owner, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should implement the recommendations in this report and notify the owner as well as our office if they consider any of the recommendations presented herein to be unsafe or unsuitable.

APPENDIX A

REFERENCES

APPENDIX A

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APPENDIX B

FIELD EXPLORATION

LOG SYMBOLS & TERMS

The No. 200 Standard Sieve is about the smallest particle visible to the naked eye.					
Coarse-grained Soils >½ of materials larger than #200 sieve	**GRAVELS** Higher percentage of coarse fraction is larger than #4 sieve	Clean Gravels (less than 5% fines)		**GW**	Well-graded gravels, little or no fines
				GP	Poorly-graded gravels, little or no fines
		5 – 12% fines		**GW-GM**	Well-graded gravel with silt
				GW-GC	Well-graded gravel with clay
				GP-GM	Poorly-graded gravel with silt
				GP-GC	Poorly-graded gravel with clay
		Gravels with fines	PI < 4	**GM**	Silty Gravels
			PI > 7	**GC**	Clayey Gravels
	SANDS Higher percentage of coarse fraction is smaller than #4 sieve	Clean Sands (less than 5% fines)		**SW**	Well-graded sands, little or no fines
				SP	Poorly-graded sands, little or no fines
		5 – 12% fines		**SW-SM**	Well-graded sand with silt
				SW-SC	Well-graded sand with clay
				SP-SM	Poorly-graded sand with silt
				SP-SC	Poorly-graded sand with clay
		Sands with fines	PI < 4	**SM**	Silty Sands
			PI > 7	**SC**	Clayey Sands
			PI 4-7	**SC-SM**	Silty clayey sands
Fine-grained Soils ≥½ of materials smaller than #200 sieve	**SILTS & CLAYS** Liquid Limit Less Than 50		PI < 4	**ML**	Inorganic silts & sandy silts
			PI > 7	**CL**	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			PI 4-7	**ML-CL**	Silts & clays of low plasticity, sandy silty clay, silty clay
	SILTS & CLAYS Liquid Limit Greater Than 50			**MH**	Inorganic silts, micaceous or diatomaceous silt, sandy silt
				CH	Inorganic clays of high plasticity, fat clays, sandy clays, gravelly clays
				OH	Organic silts and clays of medium-to-high plasticity
Highly Organic Soils				**PT**	Peat, humus swamp soils with higher organic content

Symbols	
	Ring Sample
	SPT Sample
NR	No Recovery
▽	Groundwater

Grain Size				
Description		Sieve Size	Grain Size	Approximate Size
Boulders		>12”	>12”	Larger than basketball-sized
Cobbles		3-12”	3-12”	Fist-sized to basketball-sized
Gravel	Coarse	¾-3”	¾-3”	Thumb-sized to fist-sized
	Fine	#4-¾”	0.19-0.75”	Pea-sized to thumb-sized
Sand	Coarse	#10-#4	0.079-0.19”	Rock salt-sized to pea-sized
	Medium	#40-#10	0.017-0.079”	Sugar-sized to rock salt-sized
	Fine	#200-#40	0.0029-0.017”	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029”	Flour-sized and smaller

Moisture Content
Slightly Moist
Moist
Very Moist
Wet

Consistency – Fine Grained Soils			
Apparent Density	SPT (# blows/foot)	Modified CA Sampler (# blows/foot)	Field Test
Very Soft	<1	<2	Easily penetrated by thumb; exudes between thumb and fingers when squeezed in hand
Soft	2-3	3-6	Easily penetrated one inch by thumb; molded by light finger pressure
Medium Stiff	4-6	7-12	Penetrated over ½ inch by thumb with moderate effort; molded by strong finger pressure
Stiff	7-10	13-15	Indented about ½ inch by thumb but penetrated only with great effort
Very Stiff	11-20	16-30	Readily indented thumbnail
Hard	>20	>30	Indented with difficulty by thumbnail
Relative Density – Coarse Grained Soils			
Apparent Density	SPT (# blows/foot)	Modified CA Sampler (# blows/foot)	Field Test
Very Loose	<2	<4	Easily penetrated with ½ inch reinforcing rod pushed by hand
Loose	3-5	4-10	Easily penetrated with ½ inch reinforcing rod pushed by hand
Medium Dense	6-15	11-30	Easily penetrated 1-foot with ½ inch reinforcing rod driven with a 5-lb hammer
Dense	16-25	31-50	Difficult to penetrate 1-foot with ½ inch reinforcing rod driven with a 5-lb hammer
Very Dense	>25	>50	Penetrated only a few inches with ½ inch reinforcing rod driven with a 5-lb hammer

Geotechnical Boring Log B-1

Date: March 24, 2015	**Project Name: Multi-Tenent Building** **Page: 1 of 1**
Project Number: 14396-10	**Logged By: CW**
Drilling Company: California Pacific	**Type of Rig: Mobile B53**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): 1270	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Young Alluvial Deposits (Qya):**
					SM	Silty SAND; light brown, slightly moist, loose, some gravel
5	13	R-1	-	2.6		medium dense
10	7	R-2	98.8	6.9		slightly moist to moist, loose
15	push	R-3	101.6	26.6	CL	CLAY with sand; medium brown, wet, very soft
					▽	groundwater at 15.5 feet
20	5	N-1	-	20.1	ML	Sandy SILT; medium brown, wet, medium stiff
						Total Depth: 21.5 Feet
						Groundwater at 15.5 Feet
25						
30						

Geotechnical Boring Log B-2

Date: March 24, 2015	**Project Name: Multi-Tenent Building** **Page: 1 of 2**
Project Number: 14396-10	**Logged By: CW**
Drilling Company: California Pacific	**Type of Rig: Mobile B53**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): 1271	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Young Alluvial Deposits (Qya):**
		Bag 1 @ 0-5'			SM	Silty SAND; light yellowish brown, slightly moist, loose
5	7	R-1	99.6	2.1		
					ML	Sandy SILT; moderate brown, moist, soft
	6	R-2	105.1	9.8		
10	7	R-3	99.9	8.7		medium stiff
15	4	R-4	91.6	29.1	CL	CLAY with sand; medium brown, wet, soft
				▽		groundwater at 17.5 feet
20	9	N-1	-	18.2		stiff
25	8				SC	Clayey SAND; medium brown, wet, loose
		R-5	113.3	17.9		
30						

Geotechnical Boring Log B-2

Date: March 24, 2015	**Project Name: Multi-Tenent Building** **Page: 2 of 2**
Project Number: 14396-10	**Logged By: CW**
Drilling Company: California Pacific	**Type of Rig: Mobile B53**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): 1271	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
30	27	N-2	-	12.4	GM	Silty GRAVEL with sand; grayish brown, very moist to wet, very dense
35	40	N-3	-	9.3		moist
40	32	N-4	-	13.3		very moist to wet
45	50-2"	N-5	-	NR		**Practical Refusal at 45 Feet**
						Groundwater at 17.5 Feet
50						
55						
60						

Geotechnical Boring Log B-3

Date: March 24, 2015	**Project Name: Multi-Tenent Building** **Page: 1 of 1**
Project Number: 14396-10	**Logged By: CW**
Drilling Company: California Pacific	**Type of Rig: Mobile B53**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): 1271.5	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Young Alluvial Deposits (Qya):**
					SM	Silty SAND; light brown, slightly moist, loose, some gravel
5	8	R-1	105.6	2.9		
10	9	R-2	103.0	6.3		slightly moist to moist
15	4	R-3	98.8	24.0	CL	CLAY with sand; medium brown, very moist to wet, soft
				▽		groundwater at 18 feet
20	3	N-1	-	NR		
						Total Depth: 21.5 Feet
						Groundwater at 18 Feet
25						
30						

Geotechnical Boring Log B-4

Date: March 24, 2015	**Project Name: Multi-Tenent Building** **Page: 1 of 1**
Project Number: 14396-10	**Logged By: CW**
Drilling Company: California Pacific	**Type of Rig: Mobile B53**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): 1272	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Young Alluvial Deposits (Qya):**
					SM	Silty SAND; light brown, slightly moist, loose, some gravel
					ML	Sandy SILT; medium brown, slightly moist to moist, medium stiff
5	8	R-1	100.4	6.8		
10	3	R-2	104.5	17.4		very moist, soft
15	9	R-3	96.1	23.6	CL	CLAY with sand; medium brown, wet, medium stiff, lenses of silty SAND
				▽		groundwater at 17 feet
					SM	Silty SAND; medium brown, wet, medium dense
20	7	N-1	-	NR		
						Total Depth: 21.5 Feet
						Groundwater at 17 Feet
25						
30						

APPENDIX C

LABORATORY PROCEDURES AND TEST RESULTS

APPENDIX C

Laboratory Procedures and Test Results

Our laboratory testing has provided quantitative and qualitative data involving the relevant engineering properties of the representative soils selected for testing. Representative samples were tested using the guidelines of the American Society for Testing and Materials (ASTM) procedures or California Test Methods (CTM).

Soil Classification: The soils observed during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487.

Moisture and Density Tests: For select samples, moisture content and dry density determinations were obtained using the guidelines of ASTM D 2216 and ASTM D 2937, respectively. These tests were performed on relatively undisturbed samples and the test results are presented on the exploratory logs.

Maximum Density Tests: The maximum dry density and optimum moisture content of representative samples were determined using the guidelines of ASTM D1557. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
B-2 @ 0-5 feet	Sandy CLAY	130.5	9.5

Expansion Index: The expansion potential of representative samples was evaluated using the guidelines of ASTM D 4829. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	EXPANSION INDEX	EXPANSION POTENTIAL
B-2 @ 0-5 feet	Sandy CLAY	53	MEDIUM

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests of select samples were performed using the guidelines of CTM 643. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	pH	MINIMUM RESISTIVITY (ohm-cm)
B-2 @ 0-5 feet	Sandy CLAY	7.5	1,380

Soluble Sulfate: The soluble sulfate content of select samples was determined using the guidelines of CTM 417. The test results are presented in the table below.

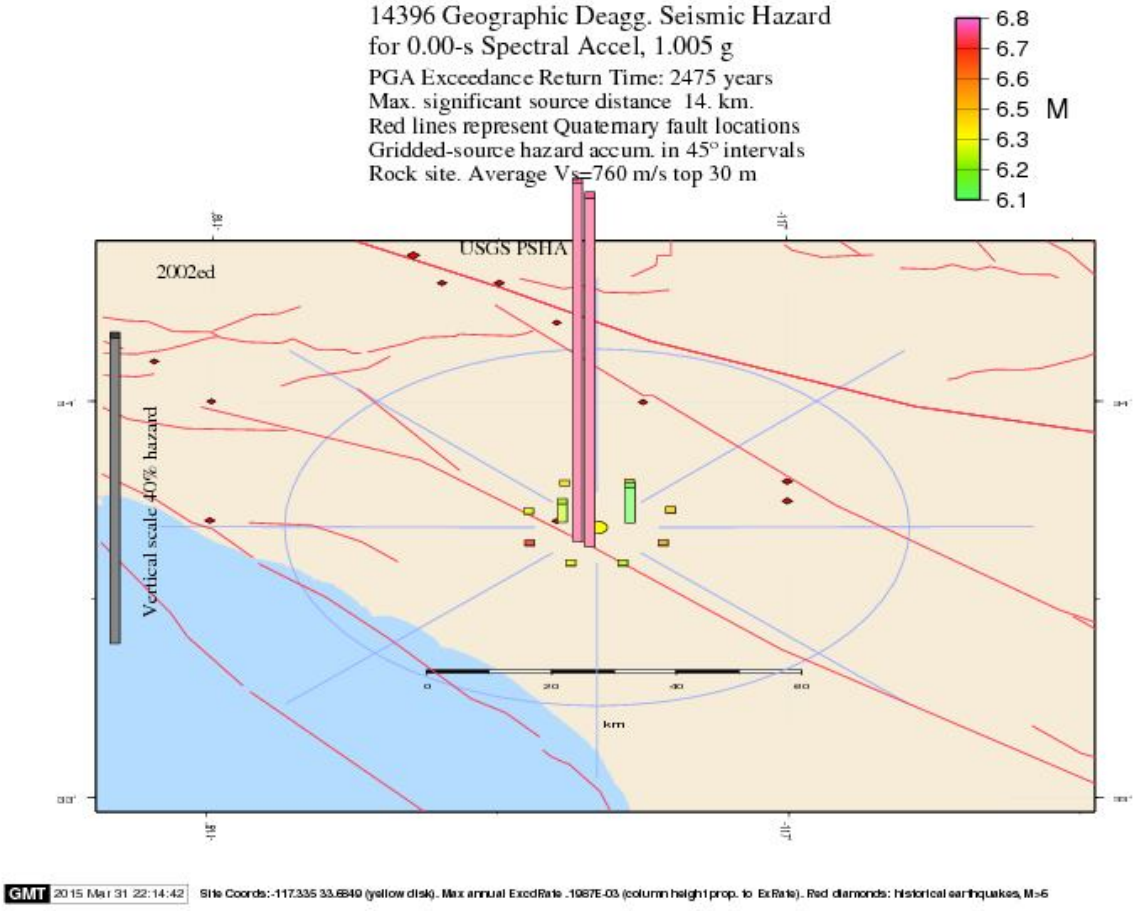
SAMPLE LOCATION	MATERIAL DESCRIPTION	SULFATE CONTENT (% by weight)	SULFATE EXPOSURE
B-2 @ 0-5 feet	Sandy CLAY	0.006	Negligible

Chloride Content: Chloride content of select samples was determined using the guidelines of CTM 422. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	CHLORIDE CONTENT (ppm)
B-2 @ 0-5 feet	Sandy CLAY	50

APPENDIX D

SEISMICITY


14396 Geographic Deagg. Seismic Hazard
for 0.00-s Spectral Accel, 1.005 g
PGA Exceedance Return Time: 2475 years
Max. significant source distance 14. km.
Red lines represent Quaternary fault locations
Gridded-source hazard accum. in 45° intervals
Rock site. Average Vs=760 m/s top 30 m
6.8
6.7
6.6
6.5
6.3
6.2
6.1
M
USGS PSHA
2002ed
Vertical scale 40% hazard
km
GMT 2015 Mar 31 22:14:42
Site Coords:-117.335 33.6849 (yellow disk). Max annual ExcdRate .1987E-03 (column height prop. to ExRate). Red diamonds: historical earthquakes, M>6

*** Deaggregation of Seismic Hazard for PGA & 2 Periods of Spectral Accel. ***
*** Data from U.S.G.S. National Seismic Hazards Mapping Project, 2002 version ***
PSHA Deaggregation. %contributions. site: 14396 long: 117.335 W., lat: 33.684 N.
USGS 2002-03 update files and programs. dM=0.2. Site descr:ROCK
Return period: 2475 yrs. Exceedance PGA =1.0054   g.
#Pr[at least one eq with median motion>=PGA in 50 yrs]=0.00000

DIST(KM)	MAG(MW)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
6.5	5.05	0.185	0.185	0.000	0.000	0.000	0.000	0.000
6.5	5.20	0.400	0.400	0.000	0.000	0.000	0.000	0.000
6.6	5.40	0.436	0.436	0.000	0.000	0.000	0.000	0.000
6.6	5.60	0.471	0.425	0.045	0.000	0.000	0.000	0.000
6.6	5.80	0.500	0.383	0.117	0.000	0.000	0.000	0.000
5.8	6.02	0.772	0.436	0.336	0.000	0.000	0.000	0.000
11.6	6.02	0.063	0.063	0.000	0.000	0.000	0.000	0.000
5.5	6.20	1.052	0.469	0.584	0.000	0.000	0.000	0.000
11.4	6.21	0.121	0.121	0.000	0.000	0.000	0.000	0.000
5.7	6.40	1.154	0.455	0.700	0.000	0.000	0.000	0.000
11.7	6.40	0.123	0.123	0.000	0.000	0.000	0.000	0.000
4.6	6.64	53.540	17.372	36.168	0.000	0.000	0.000	0.000
12.0	6.60	0.105	0.105	0.000	0.000	0.000	0.000	0.000
4.6	6.87	36.901	12.835	24.066	0.000	0.000	0.000	0.000
11.7	6.78	0.069	0.069	0.000	0.000	0.000	0.000	0.000
4.7	7.08	4.066	1.489	2.577	0.000	0.000	0.000	0.000

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
 Mean src-site R=   4.7 km; M= 6.71; eps0=   1.44. Mean calculated for all sources.
Modal src-site R=   4.6 km; M= 6.64; eps0=   1.41 from peak (R,M) bin
Gridded source distance metrics: Rseis Rrup and Rjb
 MODE R*=   4.5km; M*= 6.64; EPS.INTERVAL: 1 to 2 sigma % CONTRIB.= 36.168

Principal sources (faults, subduction, random seismicity having >10% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values)
California SS faults	92.31	4.6	6.75	1.41
Individual fault hazard details if contrib.>1%:				
Elsinore-17	45.65	4.9	6.75	1.50
Elsinore-16	46.66	4.3	6.75	1.32

********** Southern California **********
PSHA Deaggregation. %contributions. ROCK site: 14396 long: 117.335 d W., lat: 33.684 N.
USGS 2002-2003 update files and programs. Analysis on DaMoYr:31/03/2015
Return period: 2475 yrs. 1.00 s. PSA =0.9106   g.
#Pr[at least one eq with median motion>=PSA in 50 yrs]=0.00000

DIST(km)	MAG(Mw)	ALL_EPS	EPSILON>2	1<EPS<2	0<EPS<1	-1<EPS<0	-2<EPS<-1	EPS<-2
6.6	5.81	0.072	0.072	0.000	0.000	0.000	0.000	0.000
5.3	6.03	0.216	0.210	0.006	0.000	0.000	0.000	0.000
4.8	6.20	0.440	0.380	0.060	0.000	0.000	0.000	0.000
11.5	6.21	0.061	0.061	0.000	0.000	0.000	0.000	0.000
5.0	6.41	0.711	0.486	0.225	0.000	0.000	0.000	0.000
12.4	6.41	0.116	0.116	0.000	0.000	0.000	0.000	0.000
4.6	6.66	46.548	20.521	26.026	0.000	0.000	0.000	0.000
12.8	6.61	0.175	0.175	0.000	0.000	0.000	0.000	0.000
4.7	6.88	44.684	15.387	29.297	0.000	0.000	0.000	0.000
12.8	6.79	0.180	0.179	0.001	0.000	0.000	0.000	0.000
4.7	7.08	6.115	1.540	4.575	0.000	0.000	0.000	0.000
13.7	6.95	0.053	0.053	0.000	0.000	0.000	0.000	0.000
4.3	7.15	0.254	0.033	0.210	0.011	0.000	0.000	0.000
51.5	7.81	0.060	0.060	0.000	0.000	0.000	0.000	0.000
51.5	8.04	0.120	0.120	0.000	0.000	0.000	0.000	0.000
51.5	8.22	0.134	0.134	0.000	0.000	0.000	0.000	0.000

Summary statistics for above 1.0s PSA deaggregation, R=distance, e=epsilon:
 Mean src-site R=   4.9 km; M= 6.78; eps0=   1.52. Mean calculated for all sources.
Modal src-site R=   4.6 km; M= 6.66; eps0=   1.58 from peak (R,M) bin
Gridded source distance metrics: Rseis Rrup and Rjb

```
 MODE R*=   4.6km; M*= 6.88; EPS.INTERVAL: 1 to 2 sigma  % CONTRIB.= 29.297

Principal sources (faults, subduction, random seismicity having >10% contribution)
Source Category:                % contr.   R(km)    M   epsilon0 (mean values)
California SS faults              95.79     4.8   6.79    1.50
Individual fault hazard details if contrib.>1%:
Elsinore-17                       48.31     4.9   6.79    1.57
Elsinore-16                       47.16     4.4   6.78    1.43
******************** Southern California ***************************************
PSHA Deaggregation. %contributions. ROCK site: 14396  long: 117.335 d W., lat: 33.684 N.
USGS 2002-2003 update files and programs. Analysis on DaMoYr:31/03/2015
Return period: 2475 yrs. 0.20 s. PSA =2.4760   g.
#Pr[at least one eq with median motion>=PSA in 50 yrs]=0.00000
DIST(km) MAG(Mw) ALL_EPS EPSILON>2  1<EPS<2 0<EPS<1 -1<EPS<0 -2<EPS<-1 EPS<-2
    6.4    5.05    0.185    0.185    0.000    0.000    0.000    0.000    0.000
    6.5    5.20    0.407    0.407    0.000    0.000    0.000    0.000    0.000
    6.6    5.40    0.451    0.451    0.000    0.000    0.000    0.000    0.000
    6.6    5.60    0.488    0.446    0.043    0.000    0.000    0.000    0.000
    6.7    5.80    0.512    0.398    0.114    0.000    0.000    0.000    0.000
    5.9    6.02    0.755    0.436    0.319    0.000    0.000    0.000    0.000
   11.9    6.02    0.090    0.090    0.000    0.000    0.000    0.000    0.000
    5.5    6.20    1.010    0.472    0.539    0.000    0.000    0.000    0.000
   11.7    6.21    0.168    0.168    0.000    0.000    0.000    0.000    0.000
    5.7    6.40    1.112    0.466    0.646    0.000    0.000    0.000    0.000
   12.0    6.40    0.177    0.177    0.000    0.000    0.000    0.000    0.000
    4.6    6.64   53.304   16.549   36.755    0.000    0.000    0.000    0.000
   12.3    6.60    0.160    0.160    0.000    0.000    0.000    0.000    0.000
    4.6    6.87   36.971   11.765   25.207    0.000    0.000    0.000    0.000
   12.1    6.78    0.110    0.110    0.000    0.000    0.000    0.000    0.000
    4.8    7.07    3.373    1.217    2.156    0.000    0.000    0.000    0.000
    4.3    7.12    0.647    0.084    0.535    0.027    0.000    0.000    0.000

Summary statistics for above 0.2s PSA  deaggregation, R=distance, e=epsilon:
 Mean src-site R=    4.7 km; M= 6.71; eps0=   1.41. Mean calculated for all sources.
Modal src-site R=    4.6 km; M= 6.64; eps0=   1.39 from peak (R,M) bin
Gridded source distance metrics: Rseis Rrup and Rjb
 MODE R*=   4.5km; M*= 6.64; EPS.INTERVAL: 1 to 2 sigma  % CONTRIB.= 36.755

Principal sources (faults, subduction, random seismicity having >10% contribution)
Source Category:                % contr.   R(km)    M   epsilon0 (mean values)
California SS faults              92.18     4.6   6.75    1.38
Individual fault hazard details if contrib.>1%:
Elsinore-17                       46.60     4.8   6.75    1.46
Elsinore-16                       45.59     4.3   6.75    1.29
******************** Southern California ***************************************
```

Design Maps Detailed Report

ASCE 7-10 Standard (33.6849°N, 117.3358°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 2.293 g
From Figure 22-2 [2]	S_1 = 0.917 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\overline{v}_s$	$\overline{N}$ or $\overline{N}_{ch}$	$\overline{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index *PI* > 20, • Moisture content *w* ≥ 40%, and • Undrained shear strength $\overline{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk–Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_s = 2.293 g, F_a = 1.000

Table 11.4–2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.917 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 2.293 = 2.293$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.917 = 1.375$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

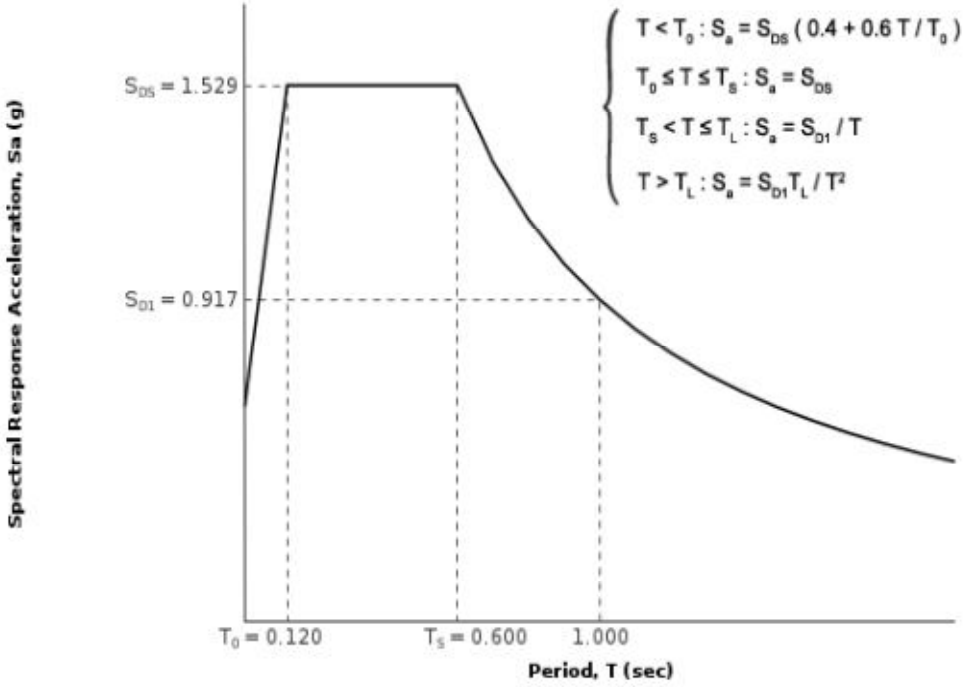
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 2.293 = 1.529$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 1.375 = 0.917$ g

Section 11.4.5 — Design Response Spectrum

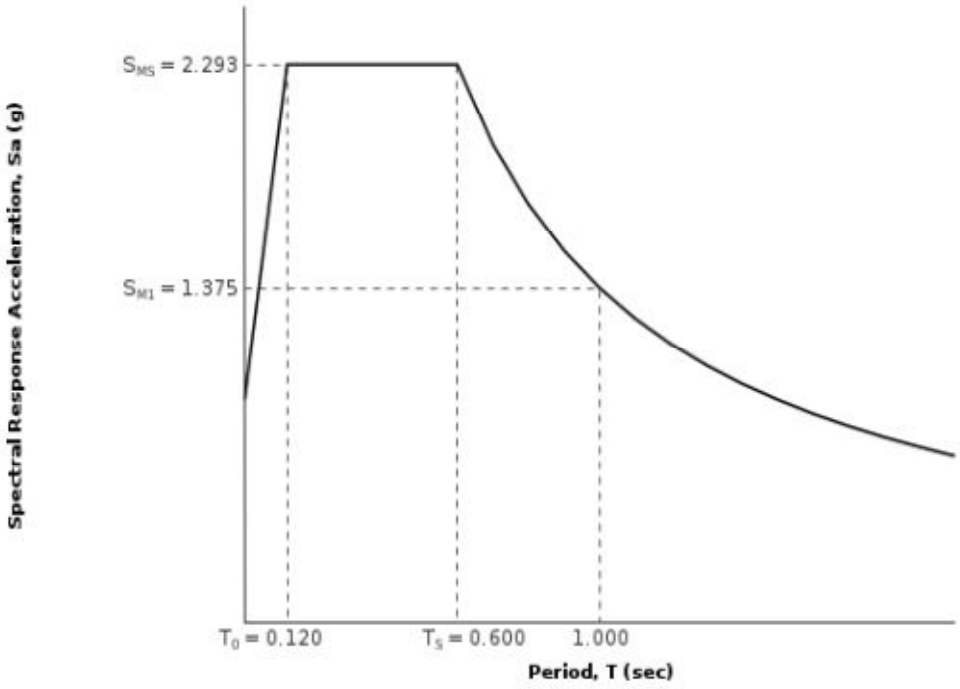
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.898

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.898 = 0.898$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.898 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 0.922

From Figure 22-18 [6] C_{R1} = 0.911

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.529 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.917 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = E

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

APPENDIX E

LIQUEFACTION ANALYSIS

LIQUEFACTION & SETTLEMENT OF SANDS ANALYSIS

Project Name: Multi-Tenent Building
Project Number: 14396-10
Boring Number: B-2

Horizontal Ground Acceleration (% g)	0.917	Energy Ratio C_E (Auto-hammer)	1.50
Analyzed Groundwater Depth (feet)	5.0	Borehole Diameter C_B (6 - 8 inches)	1.00
Average Wet Unit Weight (pcf)	110.0	Groundwater Depth in Boring (feet)	17.5
Design Magnitude Earthquake	6.8		
Magnitude Scaling Factor (MSF)	1.3		

Depth (feet)	Blow Count SPT	Blow Count Cal. Mod.	SPT N_m	Total Stress (tons/ft2)	Effective Stress (tons/ft2)	Fines Content FC(%)	C_R	Overburden C_N	rd	Sampler Type C_S	$(N_1)_{60}$	$(N_1)_{60cs}$	NCEER 1998 CSR	NCEER 1998 CRR*MSF	Liquefaction Safety Factor	Layer Thickness t (ft)	Layer Thickness t (inches)	Percent Volumetric Strain	Settlement Per Sand Layer (inches)
7		7	5.292	0.385	0.323	30	0.75	1.39	0.98	1.00	8	14	0.70	0.1997	0.29	7.00	84.00	2.90	2.44
9		6	4.536	0.495	0.370	65	0.75	1.30	0.98	1.00	7	13	0.78	0.1833	Fine Grained, Not Liquifiable	2.00	24.00	3.50	Fine Grained
15		7	5.292	0.825	0.513	65	0.85	1.09	0.97	1.00	7	14	0.93	0.1940	Fine Grained, Not Liquifiable	6.00	72.00	3.00	Fine Grained
18		4	3.024	0.990	0.584	80	0.95	1.01	0.96	1.00	4	10	0.97	0.1508	Fine Grained, Not Liquifiable	3.00	36.00	4.50	Fine Grained
25	9		9.000	1.375	0.751	80	0.95	0.94	0.94	1.20	14	22	1.03	0.3236	Fine Grained, Not Liquifiable	7.00	84.00	2.00	Fine Grained
30		8	6.048	1.650	0.870	30	1.00	0.89	0.93	1.00	8	14	1.05	0.1975	0.19	5.00	60.00	2.90	1.74
33	27		27.000	1.815	0.941	15	1.00	0.87	0.91	1.20	42	47	1.04	---	Corrected SPT >30*	3.00	36.00	0.00	0.00
38	40		40.000	2.090	1.060	15	1.00	0.83	0.86	1.20	60	65	1.02	---	Corrected SPT >30*	5.00	60.00	0.00	0.00
43	32		32.000	2.365	1.179	15	1.00	0.79	0.82	1.20	46	50	0.98	---	Corrected SPT >30*	5.00	60.00	0.00	0.00
45	100		100.000	2.475	1.227	15	1.00	0.78	0.81	1.20	141	150	0.97	---	Corrected SPT >30*	2.00	24.00	0.00	0.00
															Total Settlement (inches):				4.2

Procedure established by T.L. Youd and I.M. Idriss, et. al., 1996 NCEER-96-0022 Workshop & S.C.E.C. SP117
Evaluation of settlements in sand due to earthquake shaking, Tokimatsu and Seed, 1987

3 Extension of rod above boring (feet)

* CRR 7.5 is not defined for $(N_1)60cs$ greater than 30. Soils with (N1)60cs > 30 are considered too dense to liquefy (NCEER Workshop)

$(N_1)_{60} = N_M C_N C_E C_B C_R C_S$ $(N_1)_{60CS} = K_S(N_1)_{60}$

CW SOILS

LIQUEFACTION & SETTLEMENT OF SANDS ANALYSIS

Project Name: Multi-Tenent Building
Project Number: 14396-10
Boring Number: B-2 Compacted

Horizontal Ground Acceleration (% g)	0.917	Energy Ratio C_E (Auto-hammer)	1.50
Analyzed Groundwater Depth (feet)	5.0	Borehole Diameter C_B (6 - 8 inches)	1.00
Average Wet Unit Weight (pcf)	110.0	Groundwater Depth in Boring (feet)	17.5
Design Magnitude Earthquake	6.8		
Magnitude Scaling Factor (MSF)	1.3		

Depth (feet)	Blow Count SPT	Blow Count Cal. Mod.	SPT N_m	Total Stress (tons/ft2)	Effective Stress (tons/ft2)	Fines Content FC(%)	C_R	Overburden C_N	rd	Sampler Type C_S	$(N_1)_{60}$	$(N_1)_{60cs}$	NCEER 1998 CSR	NCEER 1998 CRR*MSF	Liquefaction Safety Factor	Layer Thickness t (ft)	Layer Thickness t (inches)	Percent Volumetric Strain	Settlement Per Sand Layer (inches)
7		30	22.680	0.385	0.323	30	0.75	1.39	0.98	1.00	35	46	0.70	---	Corrected SPT >30*	7.00	84.00	0.00	0.00
9		30	22.680	0.495	0.370	65	0.75	1.30	0.98	1.00	33	45	0.78	---	Corrected SPT >30*	2.00	24.00	0.00	Fine Grained
15		7	5.292	0.825	0.513	65	0.85	1.09	0.97	1.00	7	14	0.93	0.1940	Fine Grained, Not Liquifiable	6.00	72.00	3.00	Fine Grained
18		4	3.024	0.990	0.584	80	0.95	1.01	0.96	1.00	4	10	0.97	0.1508	Fine Grained, Not Liquifiable	3.00	36.00	4.50	Fine Grained
25	9		9.000	1.375	0.751	80	0.95	0.94	0.94	1.20	14	22	1.03	0.3236	Fine Grained, Not Liquifiable	7.00	84.00	2.00	Fine Grained
30		8	6.048	1.650	0.870	30	1.00	0.89	0.93	1.00	8	14	1.05	0.1975	0.19	5.00	60.00	2.90	1.74
33	27		27.000	1.815	0.941	15	1.00	0.87	0.91	1.20	42	47	1.04	---	Corrected SPT >30*	3.00	36.00	0.00	0.00
38	40		40.000	2.090	1.060	15	1.00	0.83	0.86	1.20	60	65	1.02	---	Corrected SPT >30*	5.00	60.00	0.00	0.00
43	32		32.000	2.365	1.179	15	1.00	0.79	0.82	1.20	46	50	0.98	---	Corrected SPT >30*	5.00	60.00	0.00	0.00
45	100		100.000	2.475	1.227	15	1.00	0.78	0.81	1.20	141	150	0.97	---	Corrected SPT >30*	2.00	24.00	0.00	0.00
															Total Settlement (inches):				1.7

Procedure established by T.L. Youd and I.M. Idriss, et. al., 1996 NCEER-96-0022 Workshop & S.C.E.C. SP117
Evaluation of settlements in sand due to earthquake shaking, Tokimatsu and Seed, 1987

3 Extension of rod above boring (feet)

* CRR 7.5 is not defined for $(N_1)60cs$ greater than 30. Soils with (N1)60cs > 30 are considered too dense to liquefy (NCEER Workshop)

$(N_1)_{60} = N_M C_N C_E C_B C_R C_S$ $(N_1)_{60CS} = K_S(N_1)_{60}$

CW SOILS

APPENDIX F

PAVEMENT DESIGN CALCULATIONS

PAVING DESIGN

PROJECT: **Multi-Tenant Building**

PROJECT NO.: **14396-10**

CONSULTANT: **CW**

CALCULATION SHEET NO.: **Auto Drives/Parking**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	50	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	50	
Input Traffic Index (TI)	5	
Calculated Total Gravel Equivalent (GE)	0.8	feet
Calculated Total Gravel Equivalent (GE)	9.6	inches
Calculated Gravel Factor (Gf) for A/C paving	2.53	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent			INCHES		FEET	
GE (feet)	GE (inches)	Delta (inches)	A/C Section Thickness (inches)	Minimum Base (inches)	A/C Section Thickness (feet)	Minimum Base (feet)
0.63	7.60	2.00	3.0	1.8	0.25	0.15
0.74	8.87	0.73	3.5	0.6	0.29	0.05
0.84	10.14	-0.54	4.0		0.33	
1.06	12.67	-3.07	5.0		0.42	
1.27	15.21	-5.61	6.0		0.50	
1.48	17.74	-8.14	7.0		0.58	
1.69	20.28	-10.68	8.0		0.67	
1.90	22.81	-13.21	9.0		0.75	
2.11	25.35	-15.75	10.0		0.83	
2.32	27.88	-18.28	11.0		0.92	
2.53	30.42	-20.82	12.0		1.00	

PAVING DESIGN

PROJECT: **Multi-Tenant Building**

PROJECT NO.: **14396-10**

CONSULTANT: **CW**

CALCULATION SHEET NO.: **Entrances/Truck Drives**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	50	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	50	
Input Traffic Index (TI)	6	
Calculated Total Gravel Equivalent (GE)	0.96	feet
Calculated Total Gravel Equivalent (GE)	11.52	inches
Calculated Gravel Factor (Gf) for A/C paving	2.31	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent			INCHES		FEET	
GE (feet)	GE (inches)	Delta (inches)	A/C Section Thickness (inches)	Minimum Base (inches)	A/C Section Thickness (feet)	Minimum Base (feet)
0.58	6.94	4.58	3.0	4.2	0.25	0.35
0.67	8.10	3.42	3.5	3.0	0.29	0.25
0.77	9.26	2.26	4.0	1.8	0.33	0.15
0.96	11.57	-0.05	5.0		0.42	
1.16	13.88	-2.36	6.0		0.50	
1.35	16.20	-4.68	7.0		0.58	
1.54	18.51	-6.99	8.0		0.67	
1.74	20.83	-9.31	9.0		0.75	
1.93	23.14	-11.62	10.0		0.83	
2.12	25.45	-13.93	11.0		0.92	
2.31	27.77	-16.25	12.0		1.00	

APPENDIX G

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

CW SOILS

General Earthwork and Grading Specifications

General

Intent: The following General Earthwork and Grading Specifications are intended to provide minimum requirements for grading operations and earthwork. These General Earthwork and Grading Specifications should be considered a part of the recommendations contained in the geotechnical report(s). If they are in conflict with the geotechnical report(s), the specific recommendations in the geotechnical report shall supersede these more general specifications. Observations made during earthwork operations by the Geotechnical Consultant may result in new or revised recommendations that may supersede these specifications and/or the recommendations in the geotechnical report(s).

The Geotechnical Consultant of Record: The Owner shall retain a qualified Consultant of Record (Geotechnical Consultant), prior to commencement of grading operations or construction. The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading operations or construction.

Prior to commencement of grading operations or construction, the Owner shall coordinate with the Geotechnical Consultant, and Earthwork Contractor (Contractor) to schedule sufficient personnel for the appropriate level of observation, mapping, and compaction testing.

During earthwork and grading operations, the Geotechnical Consultant shall observe, map, and document the subsurface conditions to confirm assumptions made during the geotechnical design phase of the project. Should the actual conditions differ significantly from the interpretive assumptions made during the design phase, the Geotechnical Consultant shall recommend appropriate changes to accommodate the actual conditions, and notify the reviewing agency as needed.

The Geotechnical Consultant shall observe the moisture conditioning and processing of the excavations and fill operations. The Geotechnical Consultant should perform periodic compaction testing of engineered fills to verify that the required level of compaction is being accomplished as specified.

The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of excavations to receive compacted fill, moisture conditioning, processing of fill, and compacting fill. The Contractor shall be provided with the approved grading plans and geotechnical report(s) for his review and acceptance of responsibilities, prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the approved grading plans and geotechnical report(s). The Contractor shall inform the Owner and the Geotechnical Consultant of work schedule changes at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. Assumptions shall not be made by the Contractor with regard to whether the Geotechnical Consultant is aware of all grading operations.

It is the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the grading operations in accordance with the applicable grading codes and agency ordinances, these specifications, and the recommendations in the approved grading plan(s) and geotechnical report(s). Any unsatisfactory conditions, such as unsuitable soils, poor moisture conditioning, inadequate compaction, insufficient buttress keyway size, adverse weather conditions, etc., resulting in a quality of work less than required in the approved grading plans and geotechnical report(s), the Geotechnical Consultant shall reject the work and may recommend to the Owner that grading operations be stopped until operations are corrected, at the sole discretion of the Geotechnical Consultant.

Preparation of Areas for Compacted Fill

Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious materials shall be sufficiently removed and properly disposed in a method acceptable to the Owner, Geotechnical Consultant, and governing agencies.

The Geotechnical Consultant shall evaluate the extent of these removals on a case by case basis. Soils to be placed as compacted fill shall not contain more than 1 percent organic materials (by volume). No compacted fill lift shall contain more than 10 percent organic matter.

If potentially hazardous materials are encountered, the Contractor shall stop work and exit the affected area, and a hazardous materials specialist shall immediately be consulted to evaluate the potentially hazardous materials, prior to continuing to work in that area.

It is our understanding that the State of California defines most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) as hazardous waste. As such, indiscriminate dumping or spillage of these fluids may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall be prohibited.

The contractor is responsible for all hazardous waste related to his operations. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Owner should contract the services of a qualified environmental assessor.

Processing: Exposed soils that have been observed to be satisfactory for support of compacted fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Exposed soils that are not satisfactory shall be removed or alternative recommendations may be provided by the Geotechnical Consultant. Scarification shall continue until the exposed soils are free of oversize material and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction. The soils should be moistened or air dried as necessary to achieve near optimum moisture content, prior to placement as engineered fill.

Overexcavation: The Typical Cut Lot Detail and Typical Cut/Fill Transition Lot Detail, included herein provide graphic illustrations that depicts typical overexcavation recommendations made in the approved grading plan(s) and/or geotechnical report(s).

Keyways and Benching: Where fills are to be placed on slopes steeper than 5:1 (horizontal to vertical), the ground shall be thoroughly benched as compacted fill is placed. Please see the three Typical Keyway and Benching Details with subtitles Cut Over Fill Slope, Fill Over Cut Slope, and Fill Slope for graphic illustrations. The lowest bench or smallest keyway shall be a minimum of 15 feet wide (or ½ the proposed slope height) and at least 2 feet into competent soils as advised by the Geotechnical Consultant. Typical benching shall be excavated a minimum height of 4 feet into competent soils or as recommended by the Geotechnical Consultant. Fill placed on slopes steeper than 5:1 should be thoroughly benched or otherwise excavated to provide a flat subgrade for the compacted fill. If unstable earth materials are encountered or anticipated the need for a buttress/stabilization fill may be required, see Typical Buttress/ Stabilization Detail herein.

Evaluation/Acceptance of Bottom Excavations: All areas to receive compacted fill (bottom excavations), including removal excavations, processed areas, keyways, and benching, shall be observed, mapped, general elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive compacted fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to placing compacted fill. A licensed surveyor shall provide the survey control for determining elevations of bottom excavations, processed areas, keyways, and benching. The Geotechnical Consultant is not responsible for erroneously located, fills, subdrain systems, or excavations.

Fill Materials

General: Soils to be used as compacted fill should be relatively free of organic matter and other deleterious substances as evaluated and accepted by the Geotechnical Consultant.

Oversize: Oversize material is rock that does not break down into smaller pieces and has a maximum diameter greater than 12 inches. Oversize rock shall not be included within compacted fill unless specific methods and guidelines acceptable to the Geotechnical Consultant are followed. For examples of methods and guidelines of oversize rock placement see the enclosed Typical Oversize Rock Disposal Detail. The inclusion of oversize materials in the compacted fill shall only be acceptable if the oversize material is completely surrounded by compacted fill or thoroughly jetted granular materials. No oversize material shall be placed within 10 vertical feet of finish grade or within 2 feet of proposed utilities or underground improvements.

Import: Should imported soils be required, the proposed import materials shall meet the requirements of the Geotechnical Consultant. Well graded, very low expansion potential soils free of organic matter and other deleterious substances are usually the most desirable as import materials. It is generally in the Owners best interest that potential import soils are provided to the Geotechnical Consultant to determine their suitability for the intended purpose. Prior to starting import operations, at least 48 hours should be allotted for the appropriate laboratory testing to be performed.

Fill Placement and Compaction Procedures

Fill Layers: Fill materials shall be placed in areas prepared to receive engineered fill in nearly horizontal layers not exceeding 8 inches in loose thickness. Thicker layers may be accepted by the Geotechnical Consultant, provided field density testing indicates that the grading procedures can obtain adequate compaction. Each layer of fill shall be spread evenly and thoroughly mixed to obtain uniformity within the soils along with a consistent moisture throughout the fill.

Moisture Conditioning of Fill: Soils to be placed as compacted fill shall be watered, dried, blended, and/or mixed, as needed to obtain relatively uniform moisture contents that are at or slightly above optimum. The maximum density and optimum moisture content tests should be performed using the guidelines of the American Society of Testing and Materials (ASTM test method D1557-00).

Compaction of Fill: After each layer has been moisture conditioned, mixed, and evenly spread, it should be uniformly compacted to a minimum of 90 percent of the

maximum dry density as determined by ASTM test method D1557-00. Compaction equipment shall be adequately sized and be either specifically designed for compaction of soils or be proven to consistently achieve the required level of compaction.

Compaction of Fill Slopes: In addition to normal compaction procedures specified above, additional effort to obtain compaction on slopes is needed. This may be accomplished by backrolling of slopes with sheepsfoot rollers as the fill is being placed, by overbuilding the fill slopes, or by other methods producing results that are satisfactory to the Geotechnical Consultant. Upon completion of grading, compaction of the fill and the slope face shall be a minimum of 90 percent of maximum density per ASTM test method D1557-00.

Compaction Testing of Fill: Field tests for moisture content and density of the compacted fill shall be periodically performed by the Geotechnical Consultant. The location and frequency of tests shall be at the Geotechnical Consultant's discretion. Compaction test locations will not necessarily be random. The test locations may or may not be selected to verify minimum compaction requirements in areas that are typically prone to inadequate compaction, such as close to slope faces and near benching.

Frequency of Compaction Testing: Compaction tests shall be taken at minimum intervals of every 2 vertical feet and/or per 1,000 cubic yards of compacted materials placed. Additionally, as a guideline, at least one (1) test shall be taken on slope faces for each 5,000 square feet of slope face and/or for each 10 vertical feet of slope. The Contractor shall assure that fill placement is such that the testing schedule described herein can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork operations to a safe level so that these minimum standards can be obtained.

Compaction Test Locations: The approximate elevation and horizontal coordinates of each test location shall be documented by the Geotechnical Consultant. The Contractor shall coordinate with the Surveyor to assure that sufficient grade stakes are established. This will provide the Geotechnical Consultant with the ability to determine the approximate test locations and elevations. The Geotechnical Consultant can not be responsible for staking erroneously located by the Surveyor or Contractor. A minimum of two grade stakes should be provided at a maximum horizontal distance of 100 feet and vertical difference of less than 5 feet.

Subdrain System Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the approved grading plan(s), and the typical details provided herein, such as the Typical

Canyon Subdrain System Detail, etc. The Geotechnical Consultant may recommend additional subdrain systems and/or changes to the subdrain systems described herein, with regard to the extent, location, grade, or materials depending on conditions observed during grading or other factors. All subdrain systems shall be surveyed by a licensed land surveyor, with the exception of retaining wall subdrain systems, to verify line and grade after installation and prior to burial. Adequate time should be allowed by the Contractor to complete these surveys.

Excavation

All excavations and overexcavations shall be evaluated by the Geotechnical Consultant during grading operations. Any remedial removal depths indicated on the geotechnical maps are estimates only. The actual removal depths and extent shall be determined by the Geotechnical Consultant based on the field observations of exposed conditions during grading operations. Where fill over cut slopes are planned, the cut portion of the slope shall be excavated, evaluated, and accepted by the Geotechnical Consultant prior to placement of the fill portion of the proposed slope, unless specifically addressed by the Geotechnical Consultant. Typical details for cut over fill slopes and fill over cut slopes are provided herein. Foundation excavations should be made in accordance with the Foundation Clearances from Slopes Detail unless otherwise specified by the site specific recommendations by the Geotechnical Consultant.

Trench Backfill

1) The Contractor shall follow all OHSA and Cal/OSHA requirements for trench excavation safety.

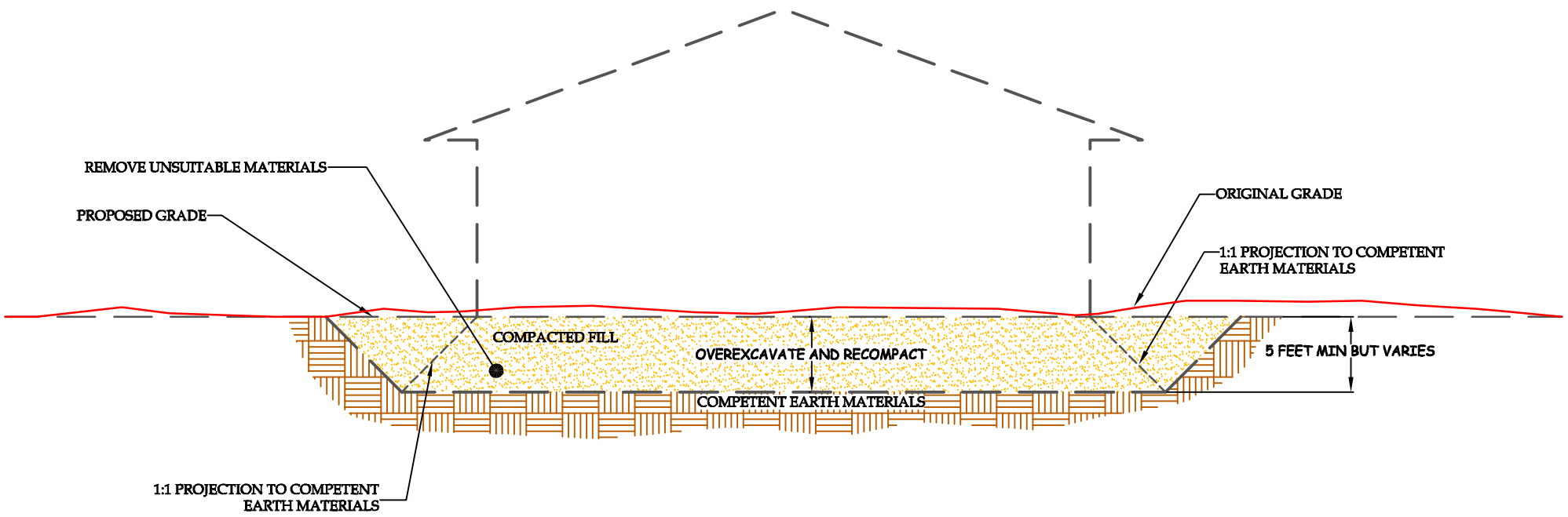
2) Bedding and backfill of utility trenches shall be done in accordance with the applicable provisions in the Standard Specifications of Public Works Construction. Bedding materials shall have a Sand Equivalency more than 30 (SE>30). The bedding shall be placed to 1 foot over the conduit and thoroughly jetting to provide densification. Backfill should be compacted to a minimum of 90 percent of maximum dry density, from 1 foot above the top of the conduit to the surface.

3) Jetting of the bedding materials around the conduits shall be observed by the Geotechnical Consultant.

4) The Geotechnical Consultant shall test trench backfill for the minimum compaction requirements recommended herein. At least one test should be conducted for every 300 linear feet of trench and for each 2 vertical feet of backfill.

5) For trench backfill the lift thicknesses shall not exceed those allowed in the Standard Specifications of Public Works Construction, unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum compaction requirements by the alternative equipment or method.

TYPICAL CUT LOT DETAIL

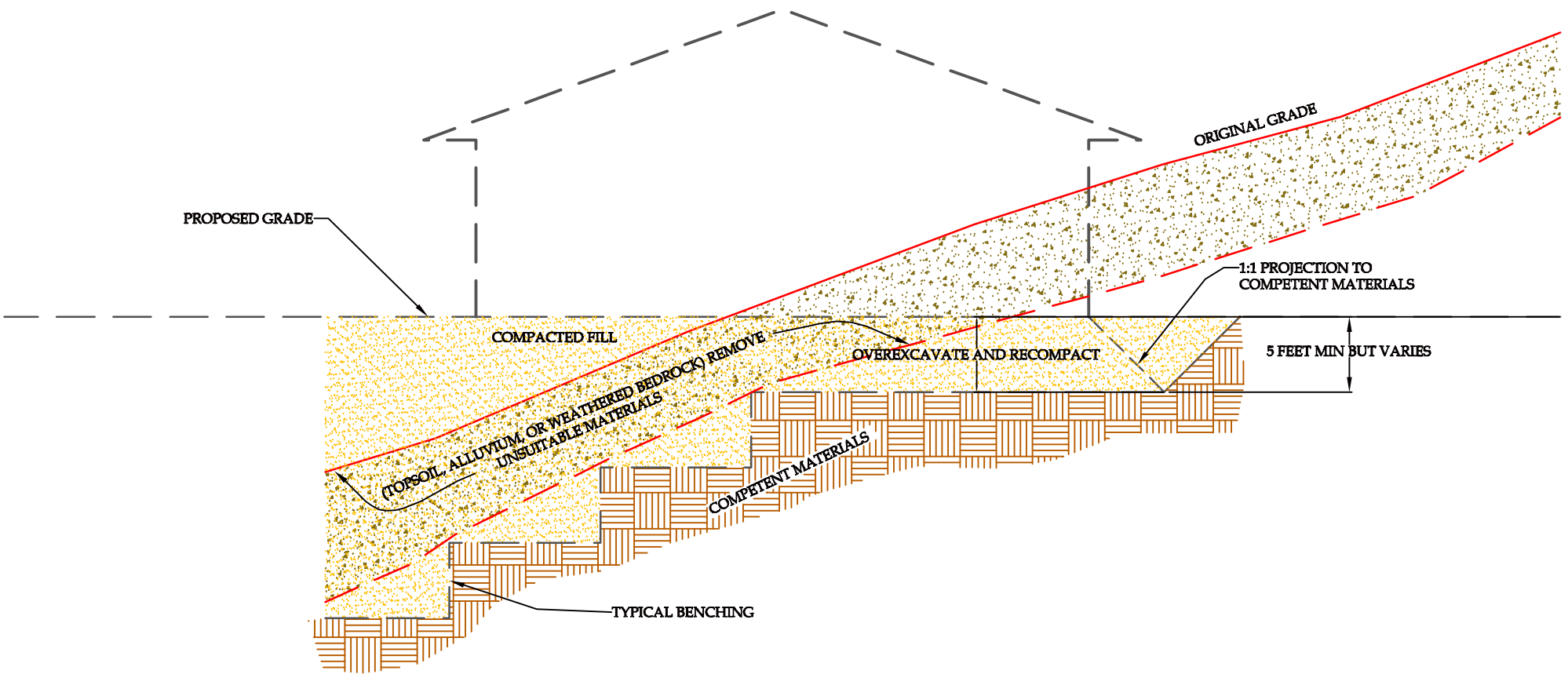


NOTE; REMOVAL BOTTOMS SHOULD BE GRADED WITH A MINIMUM 2% FALL TOWARDS STREET OR OTHER SUITABLE AREA (AS DETERMINED BY THE GEOTECHNICAL CONSULTANT) TO AVOID PONDING BELOW THE BUILDING

NOTE: WHERE DESIGN CUT LOTS ARE EXCAVATED ENTIRELY INTO COMPETENT EARTH MATERIALS, OVEREXCAVATION MAY STILL BY NEEDED FOR HARD-ROCK CONDITIONS OR MATERIALS WITH VARIABLE EXPANSION POTENTIALS

CW SOILS

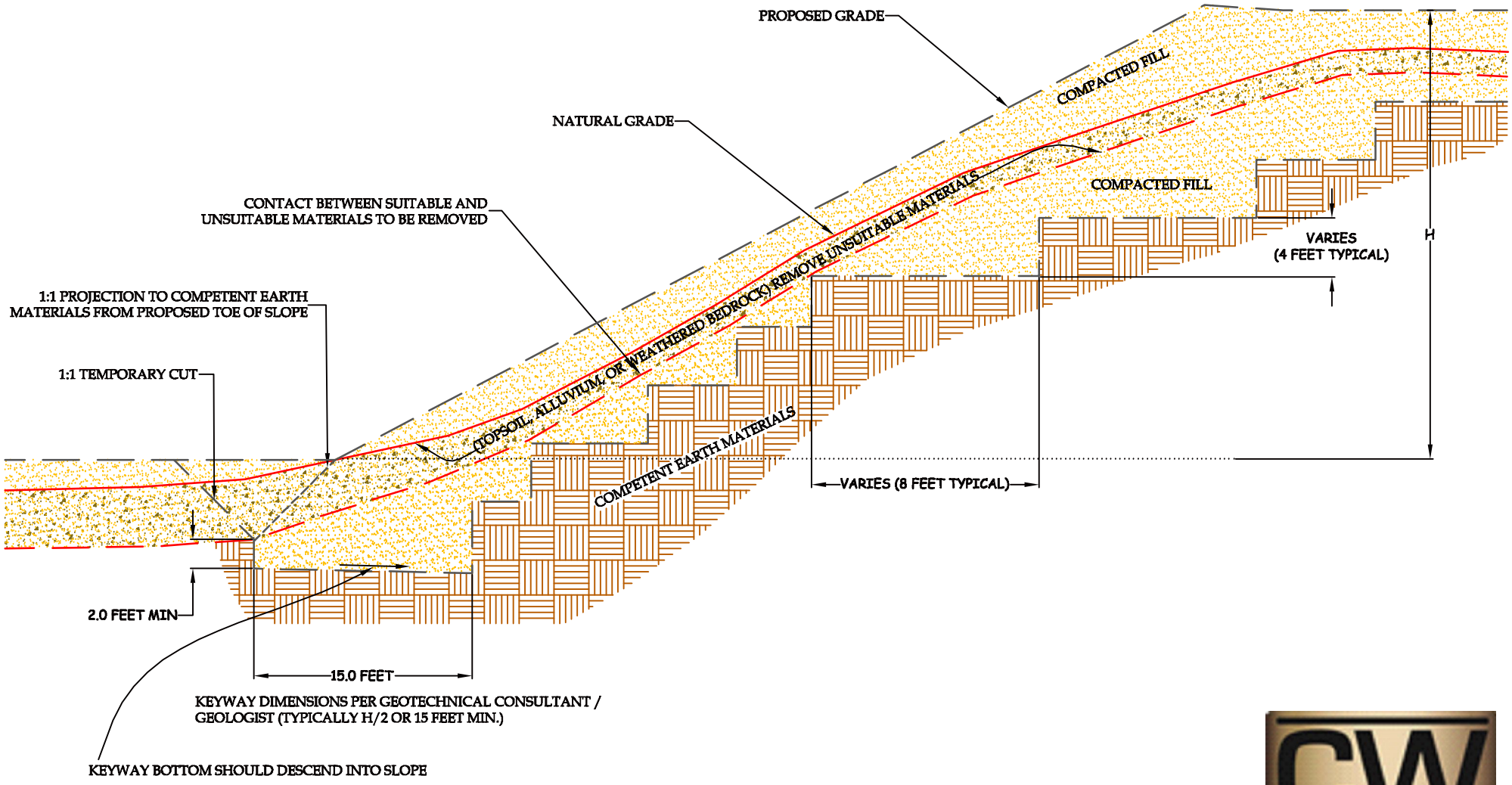
TYPICAL CUT / FILL TRANSITION LOT DETAIL



NOTE: WHERE DESIGN CUT LOTS ARE EXCAVATED ENTIRELY INTO COMPETENT MATERIALS, OVEREXCAVATION MAY STILL BY NEEDED FOR HARD-ROCK CONDITIONS OR MATERIALS WITH VARIABLE EXPANSION POTENTIALS

CW SOILS

TYPICAL KEYWAY & BENCHING DETAIL
FILL SLOPE

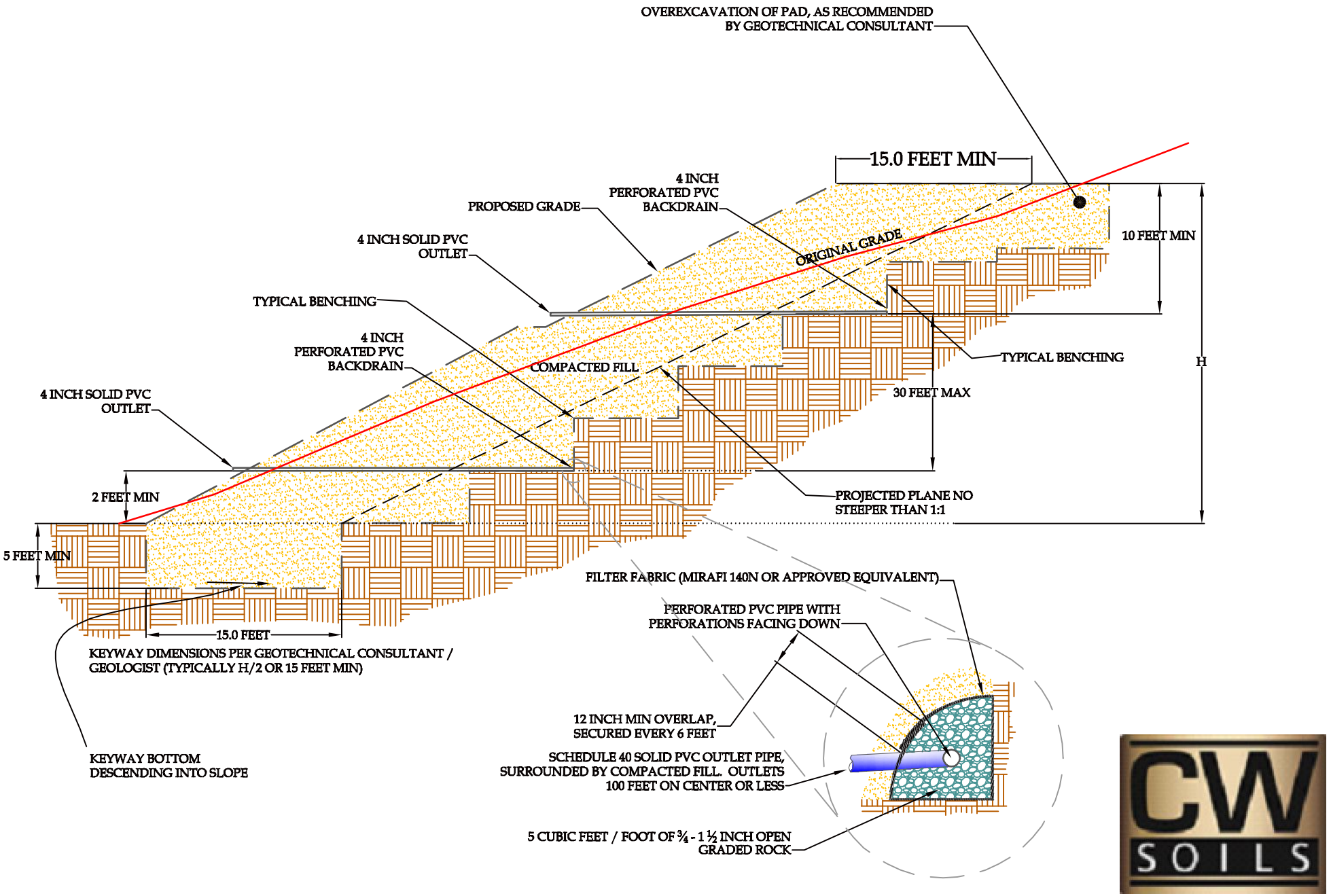


NOTES:

NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE KEYED AND BENCHED INTO COMPETENT EARTH MATERIALS

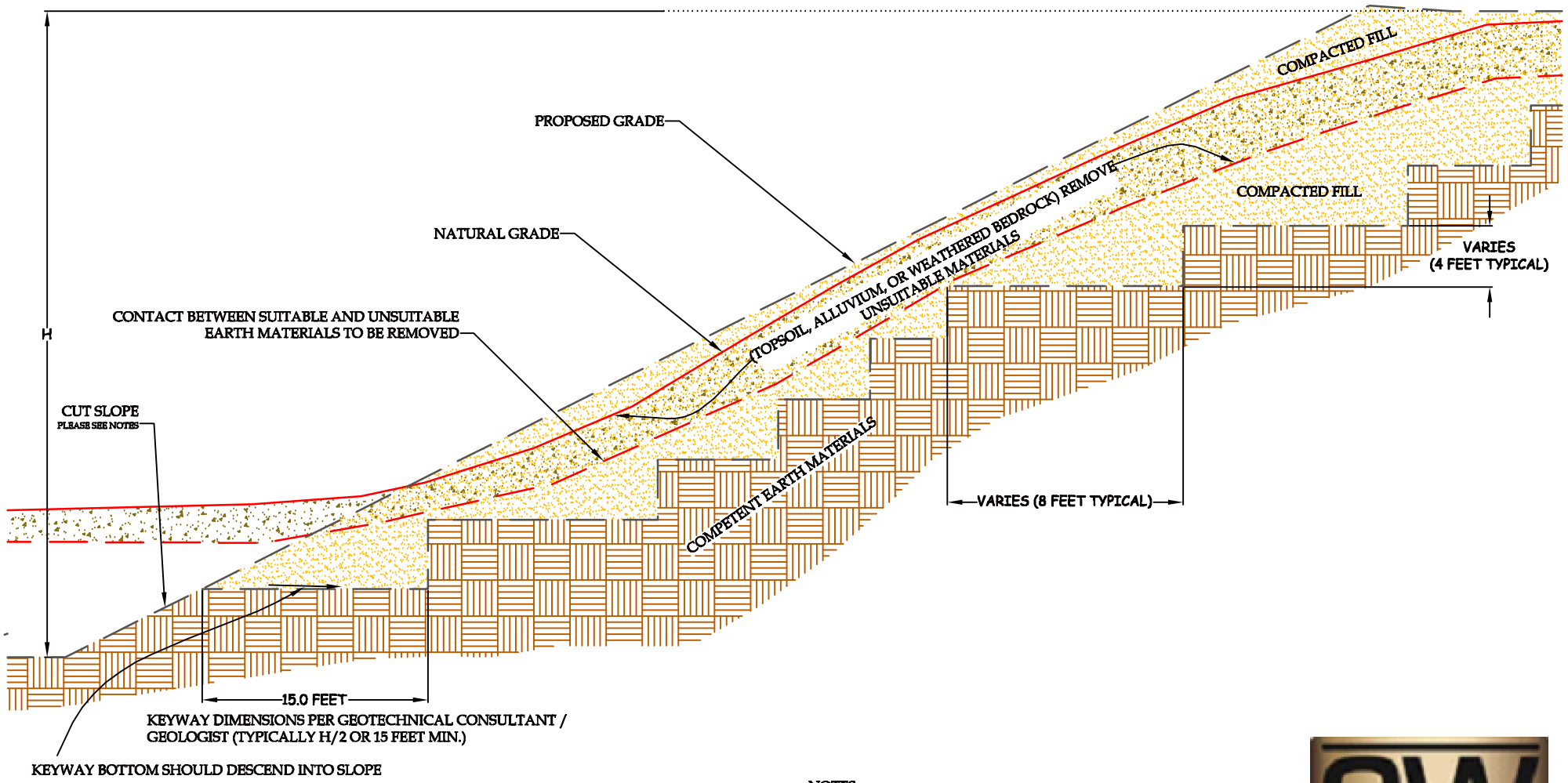
CW SOILS

TYPICAL BUTTRESS / STABILIZATION DETAIL



CW SOILS

TYPICAL KEYWAY & BENCHING DETAIL
FILL OVER CUT SLOPE



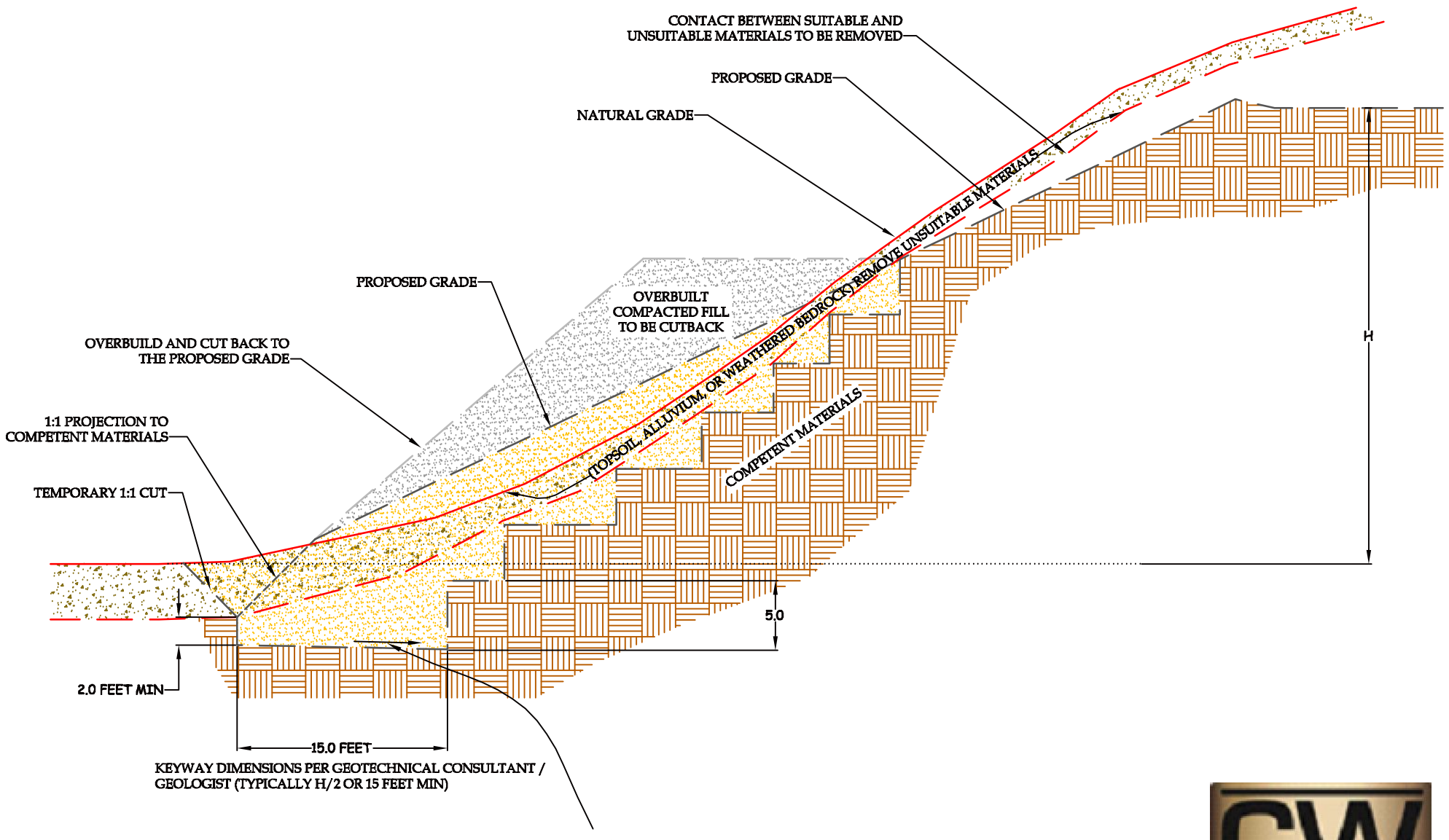
NOTES:

NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE KEYED AND BENCHED INTO COMPETENT EARTH MATERIALS

THE CUT SLOPE MUST BE CONSTRUCTED FIRST

CW SOILS

TYPICAL KEYWAY & BENCHING DETAIL
CUT OVER FILL SLOPE

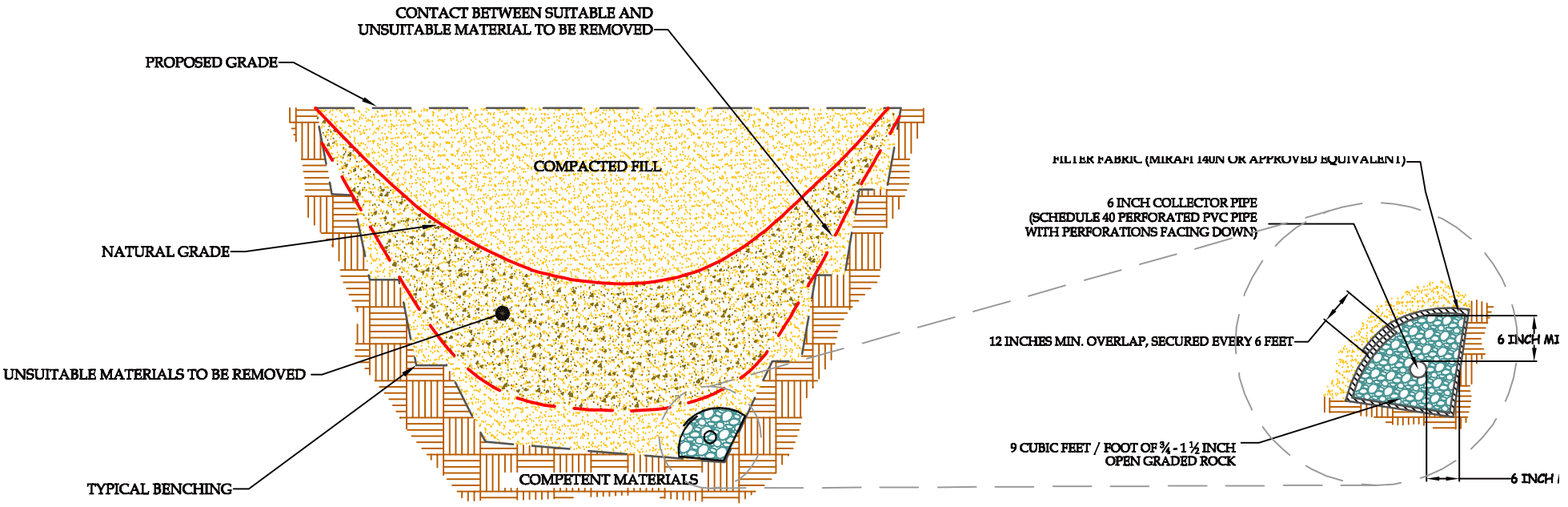


NOTE:

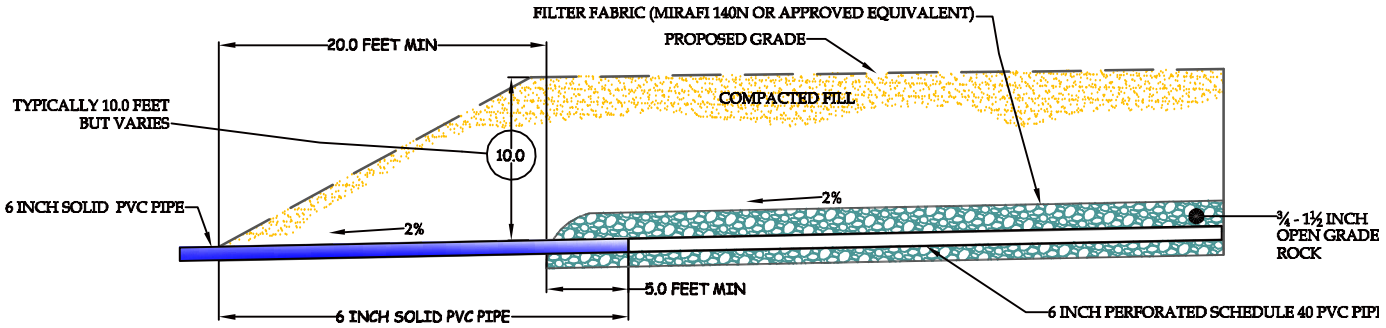
NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE KEYED AND BENCHED INTO COMPETENT MATERIALS

CW SOILS

TYPICAL CANYON SUBDRAIN SYSTEM DETAIL



TYPICAL CANYON SUBDRAIN OUTLET

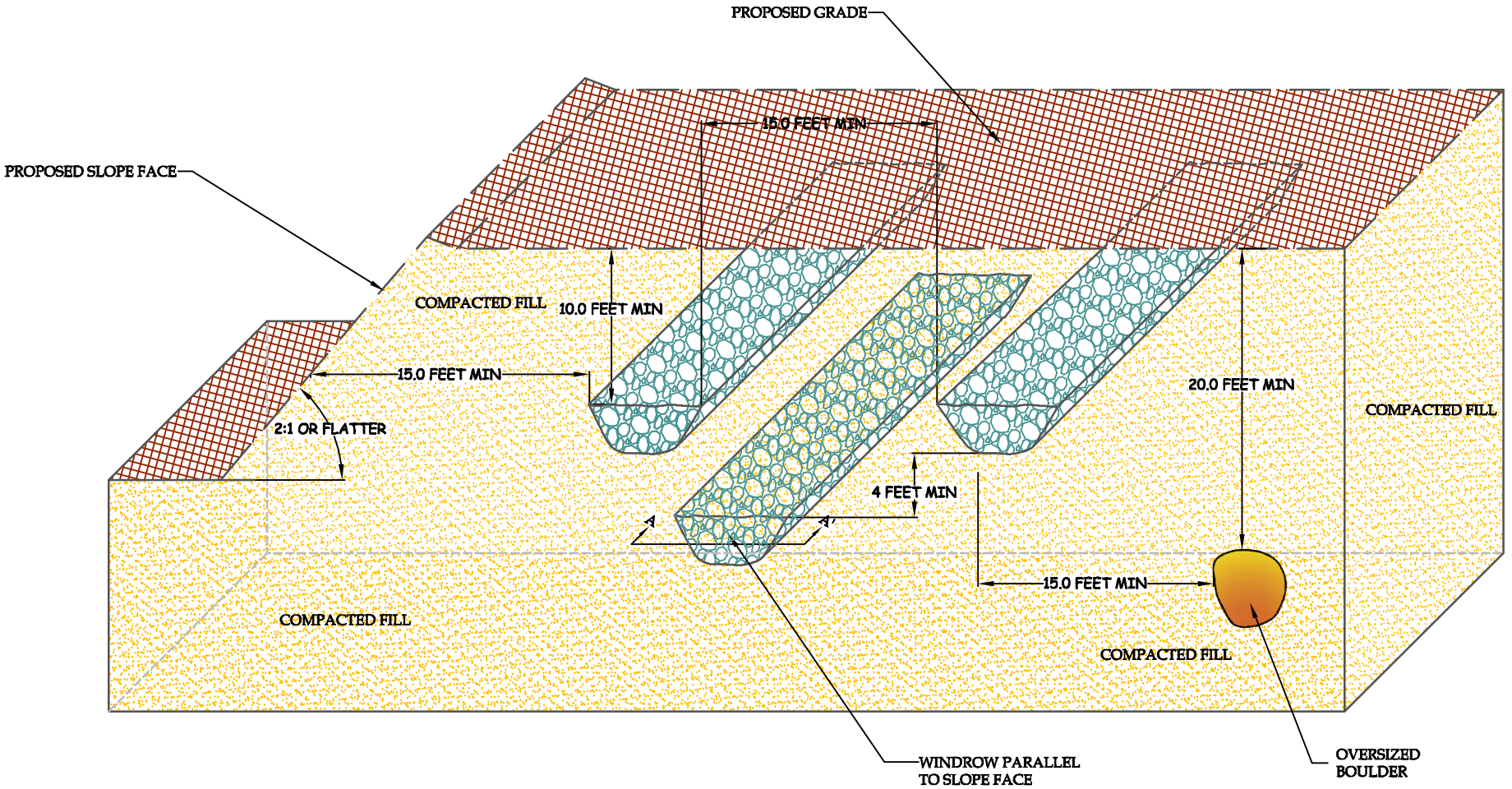


NOTES:
1 - CONTINUOUS RUNS IN EXCESS OF 500 FEET LONG WILL REQUIRE AN 8 INCH DIAMETER PIPE

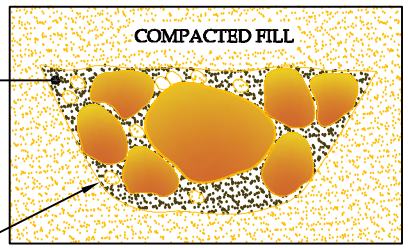
2 - FINAL 20 FEET OF PIPE AT OUTLET WILL BE SOLID AND BACKFILLED WITH COMPACTED FINE-GRAINED MATERIALS

CW SOILS

TYPICAL OVERSIZE ROCK DETAIL



CROSS SECTION A-A'

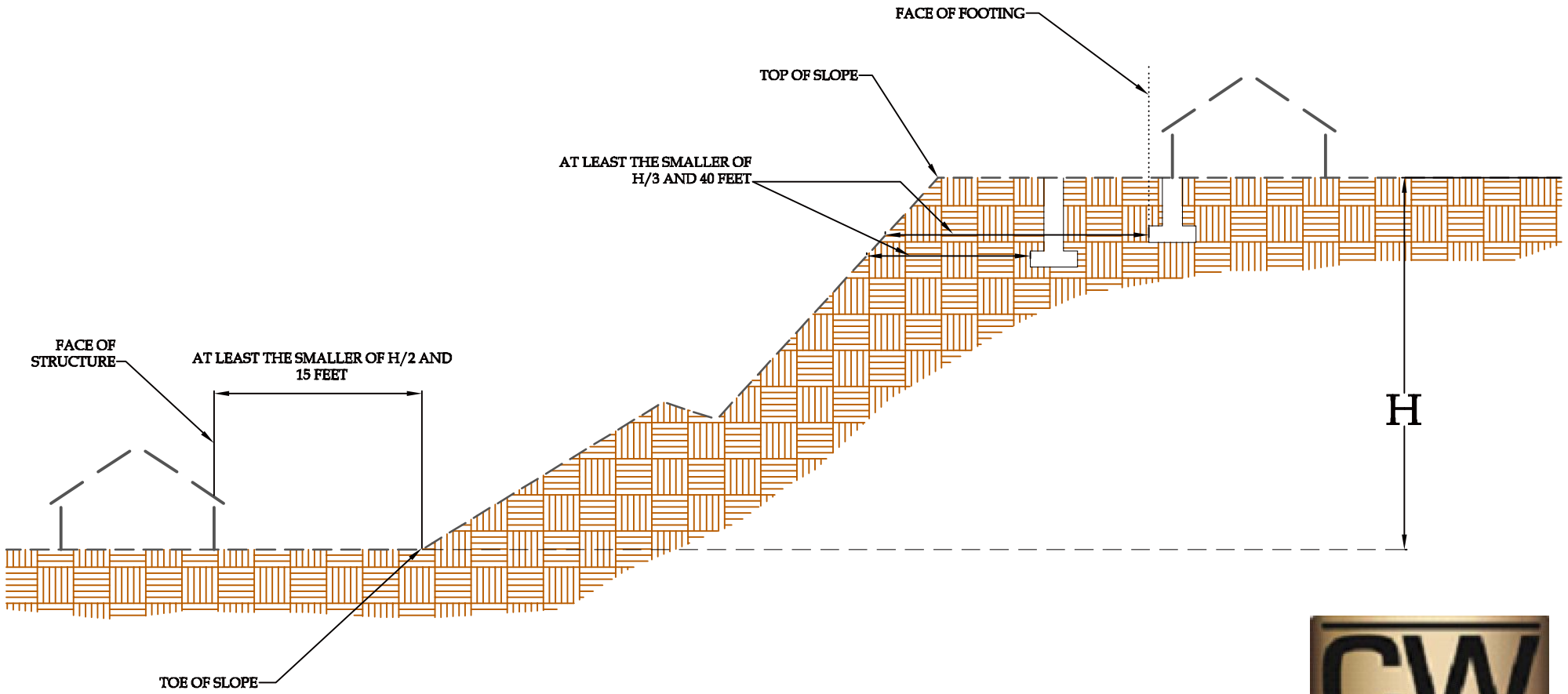


NOTE:

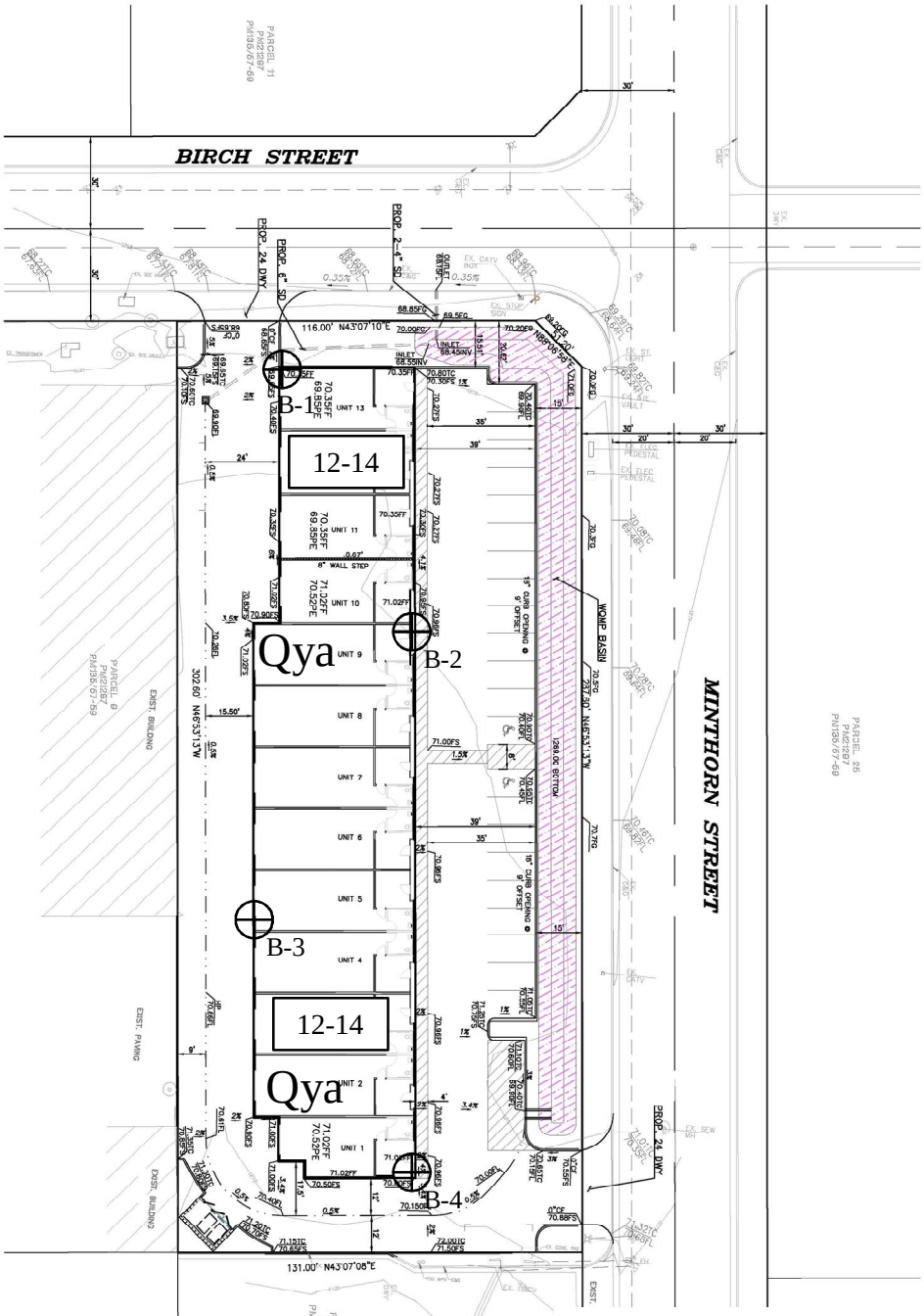
OVERSIZE ROCK IS LARGER THAN
12 INCHES IN MAX DIAMETER

CW SOILS

FOUNDATION CLEARANCES FROM SLOPES DETAIL



(CBC, 2010)



LEGEND

Locations are Approximate

Geologic Units

Qya – Quaternary Young Alluvium

Symbols

12-14 – Recommended Removal Depth (feet)

⊕ B-4 – Exploratory Boring

N
H-1
R
O
N

REFERENCE: HLC, 2015, *Conceptual Grading Plan, Parcel 10 of PM21297*, dated March 16, 2015.

CW SOILS	Proposed Multi-Tenant Building	14396-10
	GEOTECHNICAL MAP	1" = 60 '
		2015
		PLATE 1

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment

California

Environmental

ENVIRONMENTAL SITE ASSESSMENT - PHASE I

Undeveloped Property
APN 377-160-014
Southern corner of West Minthorn Street and Chaney Street,
Lake Elsinore, California 92530

FOR

FAIRWAY COMMERCIAL PARTNERS
1601 North Sepulveda Boulevard. #401
Manhattan Beach, California
Attention: Rod K. Oshita

CE Job No. EV0518-3522
July 2018

30423 Canwood Street, Suite 208, Agoura Hills, CA 91301 • P: (818) 991-1542 • F: (818) 991-1542 • E: ceworks@calenviro.com

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1.0 EXECUTIVE SUMMARY

An Environmental Site Assessment - Phase I was prepared for the subject property located at the southern corner of West Minthorn Street and Chaney Street, in the city of Lake Elsinore, California 92530. The scope of work for the Phase I meets ASTM E 1527-13 *Standard Practice for Environmental Site Assessments*. The purpose of the Phase I report is to provide information regarding the potential for hazardous material impacts to the soil and groundwater beneath the subject property. Such threats or material threats are identified in this report as Recognized Environmental Conditions (RECs). The presence of Historical Recognized Environmental Conditions (HRECs) and Controlled Recognized Environmental Conditions (CRECs) was also evaluated. The extent of this evaluation in conjunction with owner/client-supplied data is intended to satisfy the requirements of all appropriate inquiry into the previous ownership and uses of the property. The scope of the work included a site reconnaissance, research of land use records and other sources for preliminary indications of hazardous material use, storage, or disposal at the property and/or on contiguous parcels. Acquisition and commercial development of the site is proposed.

The property consists of one (1) square shaped parcel of land that encompasses approximately 4.93 acres. The property is currently undeveloped. Access to the property is via West Minthorn Street to the northeast. Historical site utilization research indicates the subject property was undeveloped from at least 1938 until 2005. Light agricultural use is evident on air photos in the 1940s and 1950s. From 2009 until 2010 the property was utilized as a contractor's storage yard. The property is currently vacant. A construction materials debris pile was observed in the south corner of the site. The pile contained concrete fragments, RCP sections, a concrete septic tank, red clay bricks, miscellaneous metal, concrete footings and small concrete slabs. Clay pot fragments, brick, small concrete pieces and asphalt grindings were spread over much of the surface of the site. No evidence of hazardous materials was observed in the construction debris observed at the site.

CE conducted screening soil sampling at the site to evaluate for TPH, metals, PCBs and organochlorine pesticides in shallow soil at the site. PCBs and pesticides were not detected. The low concentrations of TPH (40-92 mg/Kg) detected in soil are likely related to the asphalt debris observed in shallow soil and this is not an environmental concern. The concentrations of metals detected are within the ranges normally found in native soils except for an elevated concentration of lead (250 mg/Kg) detected in sample S2. The concentration of lead detected in sample S2 is below the CalEPA-DTSC screening level of 320 mg/Kg for commercial properties. CE also tested the clay pot fragments containing glazing for the presence of metals. No hazardous concentrations of metals were detected in the clay pot glazing.

The subject property is not identified on the standard environmental government sources researched in this report. The nearest listed environmental concern site is located at 653 West Minthorn Street, approximately 190 feet to the northeast. This offsite property was formerly occupied by Rightway Portable Toilets. A release from a gasoline UST impacted the soil at this offsite facility. This site was granted case closure from the Santa Ana RWQCB in 1989. Impact to the subject site from this offsite property is considered unlikely as the site was granted case closure by the Santa Ana RWQCB. No additional data regarding this offsite release was found.

One data failure was encountered during the preparation of this report. The Environmental User Questionnaire Part C was not returned. This data failure does not alter the conclusions of this report. California Environmental has prepared an Environmental Site Assessment - Phase I in conformance with the scope and limitations of ASTM 1527-13 for the property located at the southern corner of West Minthorn Street and Chaney Street, in the city of Lake Elsinore, California 92530. **No evidence of recognized environmental conditions (RECs), Historical Recognized Environmental Conditions (HREC), or Controlled Recognized Environmental Conditions (CRECs) was identified in connection with the subject property**. A contingency for management and disposal of the stockpiled construction debris is recommended.

2.0 INTRODUCTION

The following report presents the findings of the Environmental Site Assessment - Phase I prepared for the subject property located at the Southern corner of West Minthorn Street and Chaney Street, in the city of Lake Elsinore, California 92530. The scope of the Phase I study meets ASTM E 1527-13 *Standard Practice for Environmental Site Assessments* and included research of available land use records and other sources for preliminary indications of hazardous material use, storage or disposal at the property. The findings of this study are intended to provide information to the client regarding potential hazardous material impacts to the soil and groundwater beneath the site.

The scope of the investigation was conducted in general accordance with ASTM Standard Practice for Environmental Site Assessments – Phase I, Environmental Site Assessment Process ASTM E 1527-13. The steps outlined in this process are intended to permit a user (client) to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide purchaser limitations on CERCLA liability. Specifically, this report along with certain obligations of the client, constitutes All Appropriate Inquiry (AAI) into the previous ownership and uses of the property consistent with the standard of care as practiced in this area by environmental professionals. A main component of the assessment is to identify recognized environmental conditions, controlled recognized environmental conditions, and historical recognized environmental conditions, as they may affect the subject property. As defined by ASTM E 1527-13, a recognized environmental condition (REC) means *"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property."* A controlled recognized environmental condition (C-REC) is defined *as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required*

controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).” An historical recognized environmental condition (HREC) is defined as *“a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).”*

An important component of complying with the ASTM E 1527-13 Standard is information to be obtained or in the possession of the client and/or seller of the property. Such information includes obtaining and review of a recent title report, any specialized information regarding the site or surrounding area which may give rise to identification of a recognized environmental condition, and/or reasons given by the seller should the purchase price be significantly lower than what would be reasonably expected for a property of similar size and value. Often a real estate appraiser is commissioned to evaluate the purchase or sale price of a property. Such an appraisal is outside the scope of this Phase I Assessment report.

The independent conclusions represent California Environmental’s (CE) professional judgment based on the conditions that existed and the information and data available during the course of the study. Factual information regarding operations, conditions, and test data provided by the client, the owner or their representatives have been assumed to be correct and complete. This report includes **CONCLUSIONS AND RECOMMENDATIONS**, which together with the remainder of this report are subject to the **NOTICE** at the end of the report. **This report was prepared for the sole use and reliance by the client as identified on the title page of this report. Use of this report by other entities is expressly forbidden unless the client and CE grant permission.**

The scope of work included:

- A walkover of the site.
- Review of client/owner supplied information.
- Review of historical USGS topographic maps and historical aerial photographs maintained by EDR Company.
- Research of historical Sanborn Fire Insurance Maps maintained by EDR Company.
- Contact with the California Environmental Protection Agency, Department of Toxic Substances Control to review their files.
- Contact with the California Environmental Protection Agency, Regional Water Quality Control Board to review their files.
- Contact with the Riverside County Fire Department to review their files.
- Contact with the South Coast Air Quality Management District to review their files.
- Review of oil well records maintained by the State of California Division of Oil, Gas, and Geothermal Resources.
- Review of the following lists and maps of suspect or known contaminated sites; a complete listing of these sources is contained within **APPENDIX III**.
    - California Regional Water Quality Control Board, (RWQCB) - *Computer Case Listing of Reported Underground Tank Leaks*, covering Riverside County.
    - California Department of Health Services - *Hazardous Waste and Substance Sites - Cortese List and Contaminated Wells List, which includes the Bond Expenditure Plan* (BEP) sites.
    - California Environmental Protection Agency, Facility and Manifest Data, HAZNET.
    - Historical California Environmental Protection Agency, Department of Toxic Substances Control - *CalSites List*.
    - California Department of Health Services, *Hazardous Waste Information System* (HWIS) and Tanner Report.
    - California Integrated Waste Management Board, *Solid Waste Information System* - (SWIS) List.
    - State Water Resources Control Board, *Toxic Pits Clean-up Act (Toxic Pits).*

- State Water Resources Control Board, *Hazardous Substance Storage Container Database* (UST, LUST, SLIC, and WDS).
- U.S. Environmental Protection Agency - *National Priorities List* (NPL).
- U.S. Environmental Protection Agency - *Comprehensive Environmental Response, Compensation, and Liability Information System* (CERCLIS).
- U.S. Environmental Protection Agency, *Toxic Release Inventory System* (TRIS).
- U.S. Environmental Protection Agency, *Resource Conservation and Recovery Information, System Treatment, Storage and Disposal Facilities*, (RCRA-TSDF).
- U.S. Environmental Protection Agency, *Resource Conservation and Recovery Information System, Large Quantity Generators*, (RCRA-LQG).
- U.S. Environmental Protection Agency, Resource *Conservation and Recovery Information System, Small Quantity Generators*, (RCRA-SQG).
- U.S. Environmental Protection Agency - *Superfund Amendment and Reauthorization Act, Title III*, (SARA Title III).
- U.S. Environmental Protection Agency, *Emergency Response Notification System* (ERNS).
- U.S. Environmental Protection Agency, *Facility Index System* (FINDS).
- U.S. Environmental Protection Agency, *Civil Enforcement Docket* (DOCKET).

- A review of government records databases of suspect or known contaminated sites and historical city directories research was performed by EDR Company. The results of the search are summarized in this report. The EDR reports are enclosed in **APPENDICES II** and **III**.
- Conducting screening soil sampling/analysis and,
- Preparation of this report.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The subject property is located on the southern corner at the intersection of West Minthorn Street and Chaney Street, in the City of Lake Elsinore, California, see **FIGURE 1 - VICINITY MAP**. There are no current street addresses for the subject property. According to the Riverside County Tax Assessor's office, the Assessor's Parcel Number (APN) for the subject property is 377-160-014.

3.2 DESCRIPTION OF PROPERTY / PROPOSED PROJECT

The subject property consists of one (1) square-shaped parcel of land that encompasses approximately 4.93 acres. The property is currently vacant. A construction materials debris pile was observed in the south corner of the site. The pile contained concrete fragments, RCP sections, a concrete septic tank, red clay bricks, miscellaneous metal, concrete footings and small concrete slabs. Clay pot fragments, brick, small concrete pieces and asphalt grindings were spread over much of the surface of the site. Access to the property is via West Minthorn to the northeast. Acquisition and commercial development of the property is proposed.

3.3 GEOLOGY AND HYDROGEOLOGY

The subject property is located in the northern part of the Peninsular Ranges Geomorphic Province. The major structural feature of the area is the active Elsinore Fault Zone located to the south of the site, which is a major component of the right-lateral strike-slip San Andreas Fault system. The Elsinore Fault Zone separates the Santa Ana Mountains block west of the fault zone from the Perris block to the

east. The subject site is underlain by recent alluvial fan deposits that overlie metamorphic basement rocks.

The property is located within the Elsinore Groundwater Basin of the South Coast Hydrologic region. Geotechnical boring logs for the site prepared by CW Soils indicate a depth to water of 21.5 feet during April 2018. Regional groundwater level data obtained from the RWQCB GeoTracker database suggest the depth to first groundwater in the vicinity of the subject property ranges from 25 to 50 feet below ground surface (bgs). The regional direction of groundwater flow is expected to be southerly.

4.0 BACKGROUND INFORMATION

4.1 PREVIOUS WORK

No previous environmental reports were provided for the subject property.

4.2 SITE UTILIZATION HISTORY

4.2.1 Historical City Directories

EDR Company was contacted to research historical city directories for the subject property and adjacent sites. There are no City Directory listings for the subject property due to the absence of a physical property address.

4.2.2 Historical Aerial Photographs

Historical aerial photographs were reviewed as part of this study. Twelve (12) photographs are part of the aerial photograph collection maintained by the EDR Company and one (1) was obtained from Google Earths historical imagery. In total thirteen (13) photographs were reviewed for the subject

property. The photographs are summarized below in **TABLE I**. The aerial photographs are attached in **APPENDIX II** of this report.

TABLE I
Historical Aerial Photographs

Date	Source	Description
1938	USDA	The subject property appears undeveloped and is located in an area of sparse agricultural and residential development.
1949	USDA	The subject property and the adjacent properties to the southeast and southwest appear to have been developed with row crops.
1953	USDA	The previous row crops on the subject property and adjacent properties appear to have been removed. The subject property and adjacent properties are now vacant dirt lots.
1961	USDA	No significant changes to the subject property or the surrounding area are noted from the previous photograph.
1967	USDA	No significant changes to the subject property or the surrounding area are noted from the previous photograph.
1978	USDA	No significant changes to the subject property are noted from the previous photograph. The current structure to the northeast appears in its current configuration.
1985	USDA	The subject property appears to have undergone grading on the central and northern portion of the property. No significant changes to the surrounding area are noted from the previous photograph.
1989	USDA	No significant changes to the subject property are noted from the previous photograph. The structures beyond Chaney Street to the northwest appear in their current configuration.
1994	USGS/DOQQ	No significant changes to the subject property or the surrounding area are noted from the previous photograph.
2005	USDA/NAIP	No significant changes to the subject property are noted from the previous photograph. The property to the southwest appears in its current configuration.
2009	Google Earth Historic Imagery	The subject property is being utilized as a contractor's storage yard. Various building materials and supplies are scattered throughout the property. Nonnative soil stockpiles appear to be present on the northern and western corner of the property. Unidentified stockpiles appear to be present on the eastern corner of the property. The adjacent property to the southeast appears in its current configuration.
2010	USDA/NAIP	No notable changes appear to have occurred to the subject property or the surrounding area.
2014	USDA/NAIP	The previous contractor's storage yard located on the subject property has been removed. The property is now vacant. No notable changes appear to have occurred to the surrounding area.

4.2.3 Historical Fire Insurance Maps

The EDR Company was contacted to review historical fire insurance maps for the subject property. There is no Sanborn historical fire insurance map coverage for the subject property. The EDR response letter is included in **APPENDIX II** of this report.

4.2.4 Historical Topographic Maps

Historical USGS topographic maps were provided by EDR Company and from online database sources. Maps covering the subject property for eight (8) time periods were found. The topographic maps indicate that the subject property was in an area of sparse development from at least 1901 through 1988 and in an area of urban development since at least 1997.

4.3 RECORDS REVIEW INFORMATION

4.3.1 Building Information

There are no structures currently located on the subject property.

4.3.2 Underground Storage Tank & Hazardous Materials Research

An address has not been assigned to the subject property. Underground storage tank records are obtained by property address. Therefore, the Riverside County Department of Public Works does not maintain files for the subject property.

4.3.3 State Regulatory Agency File Review

An address has not been assigned to the subject property. State regulatory agency files are obtained by property address. Therefore, records were unavailable for the subject site. CalEPA DTSC and RWQCB online databases were also reviewed. The subject property is not listed on the databases researched for this report.

4.3.4 RCFD-HHMD and SCAQMD File Review

An address has not been assigned to the subject property. The Riverside County Fire Department-Health Hazardous Materials Division (RCFD-HHMD) and Southern Coast Air Quality Management District (SCAQMD) files are obtained by property address. Therefore, records were unavailable for the subject site.

4.4 SITE DRIVE-BY

A drive-by of the area within one-quarter mile of the property was conducted to help identify nearby sites that possibly use, store, or generate hazardous materials. The area surrounding the subject property consists of industrial and commercial properties. No service stations are located on the properties adjacent to the subject property. A list of selected environmental risk sites identified within a one-quarter mile radius of the subject property is included in the **STANDARD ENVIRONMENTAL RECORDS SOURCES** section of this report.

5.0 SITE RECONNAISSANCE

The site conditions were observed during a reconnaissance conducted by Ryan T. Bzoskie of California Environmental on May 5th, 2018. California Environmental completed a Field Reconnaissance Checklist during the site reconnaissance. An Environmental Owner Questionnaire was completed by Jeff Carr who answered in good faith and to the extent of his knowledge. The User Questionnaires were provided to Rod K. Oshita. The Environmental Field Reconnaissance Checklist and Environmental Owner Questionnaires are included in **APPENDIX I**. The Environmental User Questionnaires were never returned. The features described below are shown on the enclosed **FIGURE 2 - PLOT PLAN**. Photographs of the subject property are attached in the **ILLUSTRATIONS** section of this report.

5.1 DESCRIPTION OF PROPERTY/PROPOSED PROJECT

The subject property consists of one (1) square-shaped parcel of land that encompasses approximately 4.93 acres. The property is currently undeveloped. A construction materials debris pile was observed in the south corner of the site. The pile contained concrete fragments, RCP sections, a concrete septic tank, red clay bricks, miscellaneous metal, concrete footings and small concrete slabs. Clay pot fragments, brick, small concrete pieces and asphalt grindings were spread over much of the surface of the site. No evidence of hazardous materials was observed in the construction debris observed at the site. Access to the property is via West Minthorn to the northeast. Acquisition and development of the property is proposed.

5.2 ADJACENT PROPERTIES

The subject property is bound to the north by the intersection of Chaney Street and West Minthorn Street, to the east by West Minthorn Street with industrial facilities beyond, to the south by commercial structures, and to the west by Chaney Street with School structures beyond.

5.3 TOPOGRAPHY AND DRAINAGE

The subject property is relatively flat. The topographic elevation of the subject property ranges from approximately 1,282 to 1,285 feet above mean sea level. Drainage from the site is by sheetflow towards the adjacent city streets. Standing water was observed on the southeastern edge of the property. No evidence of surface drains, catch basins, or sumps was observed on the subject property at the time of the site reconnaissance.

5.4 PAST USES OF THE PROPERTY

A construction materials debris pile was observed on the southern corner of the property. Clay pottery fragments and asphalt grindings and coated ceramic were observed scattered throughout the property

surface. No other evidence of the past use, treatment, storage, disposal or generation of hazardous substances was observed on the subject property at the time of the site reconnaissance.

5.5 USE OF HAZARDOUS SUBSTANCES

No evidence of significant hazardous substance use was observed on the subject property at the time of the site reconnaissance.

5.6 STORAGE TANKS

No evidence of existing aboveground or underground storage tanks, clarifiers, sumps, or grease interceptors was observed on the subject property at the time of the site reconnaissance.

5.7 CONTAINERS OF HAZARDOUS OR UNIDENTIFIED SUBSTANCES

No evidence of containers of hazardous or unidentified substances was observed on the subject property at the time of the site reconnaissance.

5.8 SOILID WASTE DISPOSAL

Onsite disposal of solid waste material in the form of a construction debris pile and clay pottery fragments were observed on the of subject property at the time of the site reconnaissance.

5.9 POLY-CHLORINATED BIPHENYL'S (PCBs)

No evidence of PCB containing transformers or equipment was observed on the subject property at the time of the site reconnaissance.

5.10 HEATING/COOLING EQUIPMENT

There are no structures currently located on the subject property.

5.11 ASBESTOS CONTAINING MATERIALS (ACM)

There are no structures currently located on the subject property.

5.12 WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

No evidence of wastewater treatment or disposal systems was observed on the subject property at the time of the site reconnaissance.

5.13 RADON

Radon hazard assessment was not included in the scope of this study. However, the EDR research report indicates the levels of radon at Zero (0) of Six (6) sites located within the 92530 zip code in Riverside County exceeded four picoCurie per Liter (4 pCi/L), the Federal Action level.

5.14 LEAD

There are no structures currently located on the subject property.

5.15 WELLS

No evidence of dry wells, irrigation wells, injection wells, abandoned wells, monitoring wells or other wells was observed on the subject property at the time of the site reconnaissance.

5.16 ODOR

No evidence of strong, pungent or noxious odors was noted on the subject property at the time of the site reconnaissance.

5.17 STRESSED VEGETATION

No evidence of stressed vegetation was observed on the subject property at the time of the site reconnaissance.

5.18 STAINING OR RESIDUE

Reddish-gray soil was observed throughout the subject property at the time of the site reconnaissance. This coloring is likely due to the scattered pottery fragments and the asphalt grindings.

5.19 PITS, PONDS, OR LAGOONS

No evidence of pits, ponds, and/or lagoons was observed on the subject property at the time of the site reconnaissance.

5.20 POTABLE WATER SUPPLY

There are no structures currently located on the subject property.

5.21 SEWAGE DISPOSAL SYSTEM

There are no structures currently located on the subject property.

5.22 OTHER CONDITIONS OF CONCERN

No other conditions of environmental concern regarding potential sources for soil and groundwater contamination were observed on the subject property at the time of the site reconnaissance.

6.0 NEARBY CONTAMINATED SITES

6.1 LANDFILLS

The EDR database report indicates that there are no landfills or transfer stations located within a 2,000-foot radius of the subject property.

6.2 OIL FIELD MAPS/METHANE HAZARD ZONES

The State of California Division of Oil, Gas and Geothermal Resources (DOGGR) online mapping system (DOGGR Well Finder) was researched to determine if oil production occurred on or near the subject property. The DOGGR Well Finder database indicates no oil fields or oil wells are located within a 2,000-foot radius of the site. The property is not located within a Methane Hazard Zone or Methane Buffer Zone.

6.3 STANDARD ENVIRONMENTAL RECORD SOURCES

In addition to the above records, agency database lists were reviewed for known or suspected contaminated sites and for sites, which store, generate or use hazardous materials near the subject property. The subject property is not identified on the standard environmental government sources researched in this report.

The nearest listed environmental concern site is located at 653 West Minthorn Street, approximately 190 feet to the northeast. This offsite property was formerly occupied by Rightway Portable Toilets. A release from a gasoline UST impacted the soil at this offsite facility. This site was granted case closure from the Santa Ana RWQCB in 1989. Impact to the subject site from this offsite property is considered unlikely as the site was granted case closure by the Santa Ana RWQCB. No additional data regarding this offsite release was found.

The number of environmental sites listed on the databases researched for this report located within a one-half mile radius of the subject property are presented in **TABLE II**.

TABLE II
Standard Environmental Record Sources

Database	Number of Sites		
	<1/8 Mile	1/8 – 1/4 Mile	1/4 to 1/2 Mile
Federal NPL site list	0	0	0
Federal Delisted NPL Site list	0	0	0
Federal CERCLIS list	0	0	0
Federal CERCLIS NFRAP site list	0	0	0
Federal RCRA CORRACTS facilities list	0	0	0
Federal RCRA non-CORRACTS TSD facilities list	0	0	0
Federal RCRA generators list	**2**	**3**	--
Federal institutional controls / engineering controls registries	0	0	0
Federal ERNS list	0	--	--
State- and tribal - equivalent NPL	0	0	0
State- and tribal - equivalent CERCLIS	0	0	0
State and tribal landfill and/or solid waste disposal site lists	0	0	0
State and tribal leaking storage tank lists	**1**	**2**	**2**
State and tribal registered storage tank lists	0	0	--
State and tribal voluntary cleanup sites	0	0	0
State and tribal Brownfields sites	0	0	0
Local Brownfield lists	0	0	0
Local Lists of Landfill / Solid Waste Disposal Sites	0	0	0
Local Lists of Hazardous waste / Contaminated Sites	0	0	0
Local Lists of Registered Storage Tanks	**1**	**6**	--
Local Land Records	0	0	0
Records of Emergency Release Reports	0	--	--
Other Ascertainable Records	**2**	**2**	**1**
EDR Exclusive Records	0	0	0
Exclusive Recovered Govt. Archives	0	--	--
	Totals		
	6	**13**	**3**

Note: A search of public information databases may omit some nearby contaminated sites due to missing or inaccurate information in the public record.

None of the identified environmental risk sites are an environmental threat to the soil and groundwater quality at the subject site.

6.4 POTENTIAL VAPOR ENCROACHMENT CONDITION (p-VEC)

The State of California has adopted Indoor Air Quality Guidelines (CHHSLs) issued by CALEPA in 2005/2010. Potential sources for vapor intrusion to indoor air include degassing of solvents and other compounds from contaminated soil and contaminated groundwater. No evidence of soil and groundwater contamination that would suggest the potential impact of vapor encroachment into onsite structure(s) was noted within the scope of this investigation.

7.0 APPARENT PROBLEMS AND CONCERNS

- CE identified the site had an agricultural use history and was also used as a contractor's equipment storage yard. CE conducted screening soil sampling at the site to evaluate for TPH, metals, PCBs and organochlorine pesticides in shallow soil at the site. PCBs and pesticides were not detected. The low concentrations of TPH (40-92 mg/Kg) detected in soil are likely related to the asphalt debris observed in shallow soil and this is not an environmental concern. The concentrations of metals detected are within the ranges normally found in native soils except for an elevated concentration of lead (250 mg/Kg) detected in sample S2. The concentration of lead detected in sample S2 is below the CalEPA-DTSC screening level of 320 mg/Kg for commercial properties. CE also tested the clay pot fragments containing glazing for the presence of metals. No hazardous concentrations of metals were detected in the clay pot glazing. The tests on soil are presented in **TABLES I-II** in **APPENDIX IV**, with the complete lab test reports attached in **APPENDIX V**.

8.0 CONCLUSIONS AND RECOMMENDATIONS

One data failure was encountered during the preparation of this report. The Environmental User Questionnaire Part C was not returned. This data failure does not alter the conclusions of this report. Review of recorded Land Title Records including environmental liens was excluded from this report. These records should be obtained and reviewed by the user. California Environmental has prepared an Environmental Site Assessment - Phase I in conformance with the scope and limitations of ASTM 1527-13 for the property located at the southern corner of West Minthorn Street and Chaney Street, in the

city of Lake Elsinore, California 92530. **No evidence of Recognized Environmental Conditions (RECs), Historical Recognized Environmental Conditions (HREC), or Controlled Recognized Environmental Conditions (CRECs) was identified in connection with the subject property**. A contingency for management and disposal of the stockpiled construction debris is recommended.

This report is subject to the following **NOTICE**:

9.0 OPINION OF ENVIRONMENTAL PROFESSIONAL

All properties are subject to some element of environmental risk and the risk cannot be eliminated. Industrial and commercial properties developed prior to modern environmental laws are especially risk prone to environmental hazards which include, but are not limited to, wastes which may be toxic, ignitable, corrosive or reactive. The potential for these environmental hazards to impact the use of the property can be reduced by the identification and mitigation of the hazards prior to development or redevelopment of the property. Due to the difficulty in locating underground wastes, in some cases it is not always possible to ascertain that hazardous wastes are present on the property prior to development.

A Phase I environmental site assessment does not utilize subsurface exploration to check for the presence of hazardous wastes on the property. The experience of the assessor, along with the research of available reports, aerial photographs and land use records are used to evaluate the potential for hazardous wastes to occur on the site. Based on the information gained from the historical research, subsurface exploration may be recommended to check for the presence of hazardous wastes. Preexisting environmental problems such as the presence of hazardous wastes in the soil or groundwater, can be concealed by grading activities and site improvements. If such wastes are present these wastes cannot be observed.

The undersigned, Charles I. Buckley declares that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312 and I have the specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding conditions indicative of releases or threatened releases on, at, in, or to a property, sufficient to meet the objectives and performance factors in §312.20.

This report was prepared with the skill and competence as commonly used by environmental professionals in this area. No warranty, expressed or implied, of any kind is made or intended in connection with this report, or by the fact you are being furnished this report, or by any other oral or written statement.

Should you have any questions or desire any additional information, please contact the undersigned.

Respectfully submitted,

Charles I. Buckley
Professional Geologist No. 4035
Certified Engineering Geologist No. 1250
Certified Hydrogeologist No. 55

Gregory H. Buensuceso
Staff Geologist

10.0 REFERENCES AND QUALIFICATIONS

1. ASTM International, Designation: E1527-13, *Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process*, 2013.

2. ASTM International, Designation: E2600-10, *Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions*, 2010.

3. DTSC, Preliminary Endangerment Assessment Guidance Manual, January 1994 Revised October 2015.

4. SCAQMD, *File Review*, June 2018.

5. Riverside Environmental Health, *File Review*, June 2018.

6. RWQCB, *File Review*, June 2018.

7. DTSC, *File Review*, June 2018.

8. EDR Aerial Photo Decade Package, *Inquiry No. 5276026.9*, April 2018.

9. EDR Historical Topographic Map Report, *Inquiry No. 5276026.4*, April 2018.

10. EDR-Radius Map with Geocheck, *Inquiry No. 5276026.2s*, April 2018.

11. EDR-City Directory, *Inquiry No. 5276026.5*, April 2018.

12. Certified Sanborn® Map Report, *Inquiry No. 5276026.3*, April 2018.

13. State of California Division of Oil, Gas and Geothermal Resource, *Well Finder Database, 2018.*

14. Preliminary Geologic Map of the Elsinore Quadrangle, Riverside County CA, USGS, Morton and Weber, 2003.

15. USGS 7.5-minute Topographic Map, *Lake Elsinore Quadrangle*, 2012.

CHARLES I. BUCKLEY, JR.
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Agoura Hills, California 91301

EDUCATION:

- **Masters** Work in Hydrogeology
  California State University, Los Angeles, 1980-1988
- **Bachelor of Science**, Engineering Geology
  University of California, Los Angeles, 1978

REGISTRATIONS AND APPOINTMENTS:

- State Mining and Geology Board, State of California, Dept. of Conservation, Former Member, (Appointed by Gov. Pete Wilson and State Senate confirmed to 4 year term, 1997-2001)
- State of California, Certified Hydrogeologist, No. 55
- State of California, Professional Geologist No. 4035
- State of California, Certified Engineering Geologist No. 1250
- CA Contractors State License Board #732377A-Haz

PROFESSIONAL EXPERIENCE:

Jan 88-Present CALIFORNIA ENVIRONMENTAL
CEO - Principal Hydrogeologist

- Founded California Environmental in January of 1988. Clients include Fortune 500 Corporations, County Government, Municipal Agencies, Financial Institutions, Land Developers, and Consultants. Principal Investigator for groundwater supply and groundwater contamination investigations. Project leader for groundwater remediation at a State of California Superfund Sites. Principal hydrogeologist for design and implementation of a groundwater-monitoring network for an existing Sanitary Landfill. Lead investigator to delineate structure of a California Groundwater Basin; Pioneered use of a cost effective soil/gas vapor technique used to track groundwater plumes. Conducted over 3,400 Phase I Environmental Investigations in California. These investigations included the use and interpretation of historic topographic maps, Sanborn Insurance Maps, aerial photography, and other historic data sources. Successfully completed remedial clean-up on 500+ sites in southern California; including impacts associated with fuels, PCBs, metals, asbestos and chlorinated solvents. Expert consultant for environmental impairment of soil and groundwater: Expert for the Port of Los Angeles, L.A. County Counsel, L.A. City Recreation and Parks and private attorneys.

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PROFESSIONAL EXPERIENCE: (continued)

Mar 84-Dec 87 KOVACS-BYER AND ASSOCIATES
Manager Environmental Services Group

- Spearheaded the development into the groundwater and environmental segments of consulting market. Ascended from project geologist status to manager of Environmental Services Group. Responsible for all aspects of project management including; organization and staffing, developing technical requirements needed to complete projects, client and agency liaison.

- Provided technical leadership for groundwater testing including design and analysis of aquifer pump tests. Lead Geotechnical Investigator for remedial repair of complex landslide terrains. Prepared Seismic Analysis for critical facilities. Recommended specialized drainage systems for abatement of groundwater problems. Project Consultant for award winning projects on which severe geotechnical problems were overcome.

Mar 80-Mar 84 GEOTECHNICAL SERVICES GROUP
BUREAU OF ENGINEERING
CITY OF LOS ANGELES
Assistant Engineering Geologist

- Performed geologic mapping in hillside areas of the City of Los Angeles. Reviewed Geotechnical Reports submitted to the City of Los Angeles for private development. Directed landslide investigations. Prepared Expert Opinion documents regarding groundwater and geologic issues for the City Engineer and City Attorney. Conducted field monitoring of known landslides within the City of Los Angeles.

Aug 79-Mar 80 UNITED STATES GEOLOGICAL SURVEY
Field Assistant

- Assisted in geological mapping for a uranium resource development project sponsored by the Department of Energy and the United States Geological Survey.

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CONTINUING EDUCATION:

- "Advanced Data Analysis Techniques for Evaluating and Quantifying Natural Attenuation for Remediation of Contaminated Sites", NGWA Short Course, March 2007.
- "Technical Guidance for Indoor Air Vapor Intrusion", Severn Trent Laboratory, San Pedro, CA, 1/2005.
- "Low Cost Remediation Techniques", AGSE, San Francisco, CA 2002.
- "Remediation of MtBE", AGSE, Anaheim, CA 2002.
- "Assessment and Management of MtBE Impacted Sites", San Francisco, January 1999.
- "Workshop on MtBE Water Issues", Los Angeles, June 1997.
- "Management Action Programs Seminar", Newport Beach, November 1996.
- "ACWA - Groundwater Workshop", Monterey, June 1995.
- "SeSoil Modeling Workshop" GSC, San Francisco, CA, October 1994
- "Groundwater Monitoring and Remediation", Short Course AEG, October 1992
- "Microbial Processes in Biodegradation", AGSE, Albuquerque NM, February, 1991
- "Introduction to Groundwater Geochemistry", National Water Well Association, San Francisco, CA 1988
- "Fate and Transport of Contaminants in the Subsurface", United States Environmental Protection Agency, San Francisco, CA, December, 1987.
- "How to Monitor and Sample the Vadose Zone "National Water Well Association, San Diego, CA, 1988.
- "Treatment Technology for Contaminated Groundwater" UCLA Fall, 1986.
- "Groundwater Contamination Detection, Monitoring and Cleanup", UCLA, April, 1986.
- "Introduction to Groundwater Modeling", National Water Well Association, Fullerton, CA 1985.

ORAL PRESENTATIONS AND SEMINARS:

- "Environmental Geology and Hydrogeology", Guest Undergraduate Course Lecturer, UCLA Department of Geology, ESS Class 139, Spring 2017.
- "Environmental Issues and Careers", Guest Lecturer, USC Department of Geology, Spring 1992.
- "Overview of Environmental Regulations, State and Federal Laws" Guest Lecturer, University of Southern California, 1991.
- "Environmental Risks and Underground Tank Leaks, Commercial Property Inspection" California Real Estate Inspectors Association, California, May, 1988/2015
- "Modified Technique for Soil/Gas Surveys to Detect Groundwater Contamination". Association of Engineering Geologists, Southern California Section meeting. December, 1987.

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ORAL PRESENTATIONS AND SEMINARS (Continued):

- "Historic Aerial Photographic Evidence of Landslide Development, Potrero Canyon, CA." Association of Engineering Geologists Annual Meeting, San Francisco, CA., October, 1986.

PROFESSIONAL PAPERS:

- "Geology, Landslides and Slope Stabilization, Potrero Canyon Park, Pacific Palisades, CA."
- Association of Engineering Geologists Guidebook, June 20, 1987.
- "Red Rose Landslide Stabilization, 3358-3400 Red Rose Drive, CA., with Hollingsworth, R.A.; Association of Engineering Geologists Guidebook. June 20, 1987.
- "Residential Development and Landsliding, Castellammare Mesa area, Los Angeles, CA."
- Association of Engineering Geologists Guidebook June 2, 1984.

AFFILIATIONS:

- Association of Engineering Geologists.
- Association of Groundwater Scientists and Engineers.
- California Groundwater Association.
- Hazardous Waste Association of California.
- Hydrology Section-American Geophysical Union.
- National Water Well Association

ILLUSTRATIONS

Site Photographs – Plates 1-3
Figure 1 - Vicinity Map
Figure 2 - Plot Plan

View of the subject property facing east
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

View of the subject property facing north
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

PLATE 1

View of debris stockpile located on the southern corner of the property
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

View of debris stockpile located on the southern corner of the property
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

PLATE 2

View of asphalt grindings mixed with soil located on the central portion of the subject property
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

View of clay pot debris located throughout the subject property
Southern Corner of West Minthorn Street and Chaney Street, Lake Elsinore, CA 92530

PLATE 3

Scale

0 1000 2000 ft.

1 inch = 2000 feet

N W E S

References: USGS 7.5' Lake Elsinore Topographic Quadrangle, 2012.

FIGURE 1 - VICINITY MAP

West Minthorn Street

Lake Elsinore, California

Drawn By: RTB	Job # EV0518-3522
Checked By: CIB	Date: July 2018

California Environmental

3522 Vicinity Map

References: Google Earth

FIGURE 2 - PLOT PLAN
West Minthorn Street
Lake Elsinore, California

Drawn By: RTB	**Job #** EV0518-3522
Checked By: CIB	**Date:** July 2018

California Environmental

3522 Plot Plan

APPENDIX I

Environmental Field Reconnaissance Checklist and Field Interview

ENVIRONMENTAL FIELD
RECONNAISSANCE CHECKLIST (PART A)

Completed By: Ryan Bzoskie Title: Field Technician

Property Address: West Minthorn Street Date: 05-02-18

USES OF THE PROPERTY	
1. Name of present occupants of the property (include business names and addresses or unit numbers):	Vacant
2. Describe the present use(s) of the property:	Vacant
3. Describe the present of adjacent properties:	Northeast; West Minthorn Street with a Clay storage distribution facility beyond, Southeast; Office Structure, Southwest; school structures, nothwest; Chaney Street with school structures beyond
4. Is the property used for an industrial use?	No
5. Is any adjoining property used for an industrial use?	No
6. Is the property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No
7. Is the property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility?	No, however buried materials located on the southern corner of the property
8. Is any adjoining property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No
9. Is any adjoining property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility?	No
10. Is the property used for agricultural purposes?	No
PROPERTY CONDITIONS	
11. Are there or have there been any damaged or discarded industrial or automotive batteries on the property?	None Observed
12. Are there currently any solvents, paints, fuels, pesticides, herbicides, or other chemicals, in individual containers larger than 5 gallons or totaling more than 50 gallons, used on or stored at the property?	None Observed
13. Are there currently any industrial drums (typically 55 gallons) or sacks of chemicals located on the property?	None Observed
14. Is there any visible evidence fill dirt has been brought onto the property from a contaminated site?	Potentially
15. Is there any visible evidence fill dirt has been brought onto the property from an unknown site?	Potentially
16. Are there any waste treatment or waste disposal ponds, pits or lagoons on the property?	Standing water observed on the eastern corner and edge of the property

17. Is there any stained soil, or soil emitting unusual odors, on the property?	No
18. Are there any flooring, drains, or walls in the facility that are stained by substances other than water or have emitted unusual odors?	No
19. Is there heating and cooling equipment onsite?	No
20. What is the fuel source for any onsite heating and cooling equipment?	Not Applicable
21. Is there any visible evidence of storage tanks (underground or aboveground) at the property?	No
22. Are there currently or have there been any vent pipes, fill pipes, fill ports, or surface covers indicating possible fill ports on the property or adjacent to any building located on the property?	No
23. Is there visible evidence of geotechnical and/or environmental subsurface assessments such as patched borings or groundwater monitoring well covers?	None Observed
24. Are there any oil wells, drilling sumps, mud pits, or oil pipelines on or adjacent to the property?	None Observed
25. Are there any pipelines on, beneath, or adjacent to the property, other than water, sewer, and natural gas utilities serving the property?	None Observed
26. Is the property known to be located in a methane hazard area due to oil fields, natural seepage, or landfill gas?	No
27. Does the property or any facility at the property produce wastewater other than domestic sewage and storm water runoff?	No
28. Are there any waste water treatment systems (clarifiers, oil/water separators, grease traps, filtration systems, etc.) at the property?	No
29. How is waste water from the property disposed of? Sanitary sewer. Septic system. Surface water. Pond, pit, sump, or well. Other (describe).	Not Applicable
30. Does the property or any facility at the property produce solid waste other than domestic trash and greenwaste?	No
31. How is solid waste from the property disposed of? Municipal or private trash service. Recycling. Onsite dumping or burial. Other (describe).	Onsite dumping observed throughout the subject property
32. How is solid waste stored at the property?	Not Applicable
33. Does the property or any facility at the property generate hazardous or special waste in the course of normal operation? Examples include spent solvents, photo processing waste, waste oil, used filters, etc. Provide copies of generator notification or waste manifests.	No

34. If hazardous or special wastes are generated at the property, how are they stored?	Not Applicable
35. Are pesticides or herbicides stored, mixed, or disposed of on the property?	No
36. Are there any transformers, capacitors, or hydraulic equipment on the property that are known or suspected of containing PCBs?	No
37. Are there any building materials on the property known or suspected to contain asbestos? Please describe:	Unknown
ENVIRONMENTAL COMPLIANCE	
38. Does the property or any occupant of or facility on the property have any licenses, permits, registrations, or notifications for tanks, pipelines, industrial waste, wastewater treatment, wastewater discharge, stormwater discharge, waste disposal, waste storage or treatment, air emissions, chemical use, or chemical storage?	No
39. Is there visible evidence of any spills, leaks, or other releases or threatened releases of any hazardous substances or petroleum products from the property to soil, groundwater, or surface water?	No
40. Is there visible evidence of any release or threatened release of any hazardous substances or petroleum products from another location to soil, groundwater, or surface water at the property?	No
41. Is there visible evidence of the current or past existence of environmental violations on the property or in any facility located on the property?	Yes, onsite dumping observed throughout the subject property
42. Does the property discharge waste water, other than storm water runoff, into a storm drain or onto adjacent properties or streets?	No
43. Does the property discharge waste water, other than storm water, into a sanitary sewer system?	No
44. Is there visible evidence that hazardous substances, petroleum products, unidentified waste materials, tires, batteries, or any other waste materials have been dumped, buried, or burned on the property?	Yes, building materials, a tire, clay debris and other unidentified waste dumped / observed throughout the subject property

California Environmental

ceworks@calenviro.com
Fax: 818-991-1544

ENVIRONMENTAL FIELD INTERVIEW QUESTIONNAIRE (PART B)

Site Address: _____

California Environmental (CE) is asking the property owner, key site manager, and/or current user(s) of the subject property if any of the following helpful documents exist and, if so, CE requests a copy of such documents prior to the site walk. Please answer all questions on this 8 page questionnaire.

	Yes	No
• Environmental site assessment reports	☐	☒
• Environmental compliance audit reports	☐	☒
• Environmental permits	☐	☒
• Registrations for underground and aboveground storage tanks	☐	☒
• Registrations for underground injection systems	☐	☒
• Material safety data sheets	☐	☒
• Community right-to-know plan	☐	☒
• Safety plans	☐	☒
• Reports regarding hydrogeologic conditions on the subject property or surrounding area.	☐	☒
• Notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the subject property or relating to environmental liens encumbering the subject property	☐	☒
• Hazardous waste generator notices or reports	☐	☒
• Geotechnical studies	☐	☒
• Risk assessments	☐	☒
• Recorded Activity and Use Limitations (AULs), such as a deed restriction or environmental liens.	☐	☒

California Environmental is asking the property owner, key site manger, and/or current user(s) of the subject property if they have any knowledge of the following:

• Any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the subject property.	☐	☒
• Any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property.	☐	☒
• Any notices from any governmental entity regarding possible violations of environmental laws or possible liability relating to hazardous substances or petroleum products.	☐	☒

ENVIRONMENTAL FIELD INTERVIEW QUESTIONNAIRE (PART B)

For Property Owner or Occupant

Completed By: Jeff Carr Title: Owner

Property Address: _____ Date: 5/3/18

USES OF THE PROPERTY	
1. Name of present owner of the property:	Jeff and Lynn Carr
2. Name of present occupants of the property (include business names and addresses or unit numbers):	Always has been raw land
3. Describe the present use(s) of the property. Describe any manufacturing/industrial processes.	Always has been raw land
4. Describe the past use(s) of the property:	Always has been raw land
5. Provide description and initial date of construction for subject building(s). Dates of major renovations.	Always has been raw land
6. Describe the present and past use(s) of adjacent properties.	Present, social services building and school. Past uses, unknown
7. Provide the company names for utilities (water, gas and electric).	Unknown
8. Is the property used for an industrial use? If yes, please explain.	Always has been raw land
9. Is any adjoining property used for an industrial use?	No
10. Do you have any knowledge that the property or any adjoining property has been used for an industrial use in the past? If yes, please explain.	Unknown
11. Is the property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No
12. Is the property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility? If yes, please explain.	No
13. Is any adjoining property used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard? If so, identify which and give the name of the business(es):	No

14. Is any adjoining property used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility?	No
15. Do you have any knowledge that the property has been used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard in the past? If so, identify which and give the name of the business(es):	No
16. Do you have any knowledge that the property has been used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility in the past? If yes, please explain.	No
17. Do you have any knowledge that any adjoining property has been used as a gasoline station, auto repair facility, commercial printing facility, dry cleaners, photo developing laboratory, or junkyard in the past? If so, identify which and give the name of the business(es):	No
18. Do you have any knowledge that any adjoining property has been used as a landfill or a waste treatment, storage, processing, recycling, or disposal facility in the past?	No
19. Is the property used for agricultural purposes, or has it been used for agricultural purposes in the past? Provide MSDS's and/or list of agricultural chemicals applied to property.	No
PROPERTY CONDITIONS	
20. Do you have any knowledge of a backup generator? What is the fuel source for the backup generator?	No
21. Are there or have there been any damaged or discarded industrial or automotive batteries on the property? If yes, please explain.	No
22. Are there currently any solvents, paints, fuels, pesticides, herbicides, or other chemicals, in individual containers larger than 5 gallons or totaling more than 50 gallons, used on or stored at the property? If yes, please explain.	No

23. Do you have any knowledge that there have been any solvents, paints, fuels, pesticides, herbicides, or other chemicals, in individual containers larger than 5 gallons or totaling more than 50 gallons, used on or stored at the property in the past? If yes, please explain.	No
24. Are there currently any industrial drums (typically 55 gallons) or sacks of chemicals located on the property? Provide Disposal Manifests, MSDS's and/or list with quantities. If yes, please explain.	No
25. Do you have any knowledge that there have been any industrial drums (typically 55 gallons) or sacks of chemicals located on the property in the past? If yes, please explain.	No
26. What is the current topography (level, sloped, uneven, hill, valley, etc.) of the property?	level
27. Do you have any knowledge that fill dirt has been brought onto the property from a contaminated site? If yes, please explain.	No
28. Do you have any knowledge that fill dirt has been brought onto the property from an unknown site? If yes, please explain.	No
29. Are there currently or have there been any waste treatment or waste disposal ponds, pits or lagoons on the property? If yes, please explain.	No
30. Is there currently or has there been any stained soil, or soil emitting unusual odors, on the property? If yes, please explain.	No
31. Are there, or have there been in the past, any flooring, drains, or walls in the facility that are stained by substances other than water or have emitted unusual odors? If yes, please explain.	No
32. Are there any heating and cooling equipment on the property? If yes, please explain.	No
33. What is the fuel source (heating oil, gas, electric, etc.) for any onsite heating and cooling equipment?	No

34. Are there currently or have there been any registered or unregistered storage tanks (underground or aboveground) at the property? List size and/or quantity.	No
35. What year was underground or aboveground storage tank installed and/or removed?	N/A
36. Are there currently or have there been any vent pipes, fill pipes, fill ports, or surface covers indicating possible fill ports on the property or adjacent to any building located on the property?	No
37. Are there currently or have there been any oil wells, drilling sumps, mud pits, or oil pipelines on or adjacent to the property? If yes, please explain.	No
38. Are there currently or have there been any pipelines on, beneath, or adjacent to the property, other than water, sewer, and natural gas utilities serving the property?	Not that I am aware of
39. Is the property known to be located in a methane hazard area due to oil fields, natural seepage, or landfill gas?	Not that I am aware of
40. Does the property or any facility at the property produce wastewater other than domestic sewage and storm water runoff?	No
41. Are there any wastewater treatment systems (clarifiers, oil/water separators, grease traps, filtration systems, etc.) at the property?	No
42. How is wastewater from the property disposed of? Sanitary sewer. Septic system. Surface water. Pond, pit, sump, or well. Other (describe).	Always has been raw land
43. Does the property or any facility at the property produce solid waste other than domestic trash and greenwaste?	Always has been raw land
44. How is solid waste from the property disposed? Municipal or private trash service, recycling, onsite dumping or burial. List service company. Other (describe).	Always has been raw land
45. How is solid waste stored at the property?	Always has been raw land

46. Does the property or any facility at the property generate hazardous or special waste in the course of normal operation? Examples include spent solvents, photo processing waste, waste oil, used filters, etc. Provide copies of generator notification or waste manifests.	Always has been raw land
47. Has the property or any facility at the property generated hazardous or special waste due to occasional or one-time events such as asbestos abatement, soil or groundwater cleanup, or accidental events such as spills? Provide copies of waste manifests.	Always has been raw land
48. If hazardous or special wastes are generated at the property, how are they stored?	Always has been raw land
49. Have pesticides or herbicides been stored, mixed, or disposed of on the property?	Not that I am aware of
50. Are there any transformers, capacitors, or hydraulic equipment on the property that are known or suspected of containing PCBs?	Not that I am aware of
51. Are there any building materials on the property known or suspected to contain asbestos? Please describe:	No
52. Have any asbestos surveys been performed at the property? Please provide copies of survey reports.	Always has been raw land
53. Have any asbestos removal or other abatement projects taken place at the property? Please describe and provide documentation.	Always has been raw land
54. Is there any known or suspected lead-based paint in buildings located at the property? Please provide copies of survey reports.	Always has been raw land
55. Has radon testing ever been conducted at the property? Please provide test reports.	Always has been raw land

ENVIRONMENTAL COMPLIANCE	
56. Has the property ever been the subject of an environmental site assessment or environmental audit, with respect to soil, groundwater, surface water, air, or site facilities and processes? Has any environmental site assessment of the property indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property? Please provide a copy of such reports and describe the manner in which any recognized environmental conditions have been addressed.	Not that I am aware of
57. Does the property or any occupant of or facility on the property have any licenses, permits, registrations, or notifications for tanks, pipelines, industrial waste, wastewater treatment, wastewater discharge, stormwater discharge, waste disposal, waste storage or treatment, air emissions, chemical use, or chemical storage? Please provide copies of such documents.	No
58. Have you been informed of the current or past existence of hazardous substances or petroleum products on the property or in any facility located on the property?	Always has been raw land
59. Do you have knowledge of any spills, leaks, or other releases or threatened releases of any hazardous substances or petroleum products from the property to soil, groundwater, or surface water?	No
60. Do you have knowledge of any release or threatened release of any hazardous substances or petroleum products from another location to soil, groundwater, or surface water at the property?	No
61. Have you been informed of the current or past existence of environmental violations on the property or in any facility located on the property?	No

62. Do you have any knowledge of environmental liens or governmental notifications relating to violations of environmental laws with respect to the property or any facility located on the property?	No
63. Do you have knowledge of any past, threatened, or pending lawsuits, enforcement actions, or administrative proceedings concerning the property.	No
64. If the property is served by a private well or a non-public water system, do you have any knowledge that contaminants exceeding applicable guidelines have been identified in the well or water system, or has the well or system been designated as contaminated by any governmental agency?	No
65. Does the property discharge waste water, other than storm water runoff, into a storm drain or onto adjacent properties or streets?	Always has been raw land
66. Does the property discharge waste water, other than storm water, into a sanitary sewer system?	Always has been raw land
67. Do you have any knowledge that hazardous substances, petroleum products, unidentified waste materials, tires, batteries, or any other waste materials have been dumped, buried, or burned on the property?	Always has been raw land

APPENDIX II

EDR City Directory, Aerial Photographs, Sanborn Maps, and Topographic Maps

3522
West Minthorn Street
Lake Elsinore, CA 92530

Inquiry Number: 5276026.5
May 02, 2018

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.

Data by
infoUSA®

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2011	☑	☐	Haines Criss-Cross Directory
2005	☑	☐	Haines Criss-Cross Directory
2000	☑	☐	Haines Criss-Cross Directory
1995	☑	☐	Haines Criss-Cross Directory
1990	☑	☐	Haines Criss-Cross Directory
1985	☑	☐	Haines Criss-Cross Directory
1980	☑	☐	Haines Criss-Cross Directory
1975	☑	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

West Minthorn Street
Lake Elsinore, CA 92530

Year	*CD Image*	*Source*
W MINTHORN ST		
2011	pg A1	Haines Criss-Cross Directory
2005	pg A2	Haines Criss-Cross Directory
2000	pg A3	Haines Criss-Cross Directory
1995	pg A4	Haines Criss-Cross Directory
1990	pg A5	Haines Criss-Cross Directory
1985	pg A6	Haines Criss-Cross Directory
1980	pg A7	Haines Criss-Cross Directory
1975	pg A8	Haines Criss-Cross Directory

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 2011

MINTHORN ST (07)
92530 LAKE ELSINORE

18520	★ TELECOM LOGISTICS INC	951-674-2139	+0
18550	★ ELECTRL SERVICES CORP	951-245-1844	7
	★ MOTOWORKS	951-587-9222	7

★ 3 BUS 0 RES 1 NEW

W MINTHORN ST 92530
LAKE ELSINORE

131	● SOLIS Angelina	OO	

X N SPRING ST

202	★ MENIFEE VALLEY AIRCONDITIONING	951-471-3414	4

X COLLIER AVE

311	♣ CHUA Rosario	951-471-1548	8
	♣ ★ HARVEY'S STEREO SHOP	951-245-5906	8
2	★ M J DESIGN	951-245-1418	
403	★ THERMAL ELECTRONICS	951-674-7771	
506	★ CREST DOOR&TRIM	951-674-5507	6
609	★ STEVE'S TWNG TMCLA MRRTA LK	951-471-1166	9
653	HARDING Robt	951-674-2918	
	★ RIGHTWAY SEPTIC TANK PUMPING	951-674-2708	
	★ RIGHTWAY TEMP POWER	951-674-2626	

X CHANEY ST

1400	★ COUNTY OF RVRSD ADLT PRTCTVE	951-245-3020	9
	★ LAKE ELSN OFFICE PARK LP	951-674-9722	8

X BIRCH ST

★ 10 BUS 3 RES 0 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 2005

W MINTHORN ST 92530
LAKE ELSINORE

WEALTH CODE 0

131 •SOLIS Angelina OO 0
X N SPRING ST
202 ★MENIFEE VALLEY 951-471-3414 +4
AIRCONDITIONING
X COLLIER AVE
X RILEY ST
311 ★DAVE'S AUTOMOTIVE 951-674-1984 0
★M J DESIGN 951-245-1418
X N LANGSTAFF ST
403 ★THERMAL 951-674-7771
ELECTRONICS
505 XXXX OO
506 ★U-HAUL CO 951-245-2875 3
INDEPENDENT
DEALERS
600 XXXX OO
609 XXXX OO
653E HARDING Robt 951-674-2918
653 ★RIGHTWAY PRTBL 951-674-8608
TLTS TEMP
★RIGHTWAY SEPTIC 951-674-8608
TANK PUMPING
★RIGHTWAY TEMP 951-674-2626
POWER
X CHANEY ST
X BIRCH ST
X 3RD ST
X CRANE ST
1400 •RUIZ Manuel OO +4
★ 8 BUS 6 RES 2 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 2000

MINTHORN W 92530
LAKE ELSINORE

WEALTH CODE 0.0

131	●SOLIS Angelina	OO
202	★ NORTEL INSTALLA COTION&MNTNC	909-245-735
311	●ALCALAY Louis	OO
	★ DAVES AUTOMOTIVE	909-674-1
	★ M J DESIGN	909-245-1
403	★ THERMAL ELECTRONICS	909-674-777
505	XXXX	OO
506	●OUTHUUSE John	OO
600	★ PACIFIC WOODHAWK INC	909-674-779
609	●FARIAS Maria	OO
653	●HARDING Robt	909-674-291
	★ RIGHTWAY PRTBLE TLTS TMPRY PWR	909-674-860
	★ RIGHTWAY SEPTIC TANK PUMPING	909-674-860
	★ RIGHTWAY TEMP POWER	909-674-862

★ 8 BUS 7 RES 6 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 1995

MINTHORN W 92530
LAKE ELSINORE

WEALTH CODE 1.0

302	*E ENTERPRISES	674-1264	
	*ESTATE EQUITIES	674-1264	
311	*DONS ART	674-9698	3
	*GRINDER PRODUCTS	245-0247	+5
	*KENDALL METAL PROD	245-2981	+5
	*M J DESIGN	245-1418	0
	*WHITE JOHN R PRNTG	245-1598	+5
403	*THERMAL ELECTRONICS	674-7771	7
505	XXXX	00	
506	*STREAMLINE CABINETS	674-3735	
600	*PAC WOODHAWK INC	674-7794	0
609	*ZIEMBAS AUTOMOTIVE	674-5075	+5
610	*CROWBAR AUTO DSMNTL	674-7702	
	*CROWBAR AUTO TOWING	674-4215	
653	HARDING Robt	674-2918	
	*RIGHTWAY TEMP POWER	674-2626	
	*RIGHTWAY TOILETS	674-8608	3
1400	VELAZQUEZ Andres	674-3481	+5

* 15 BUS 3 RES 5 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 1990

MINTHORN W 92330
LAKE ELSINORE

131	GOMEZ Felix L	00	+0
	SOBERANES Maximino	00	
	SOLIS Richard E	00	
302	*E ENTERPRISES	674-1264	9
	*ESTATE EQUITIES	674-1264	
311	*CA PERFORMANCE	674-7435	+0
	*M J DESIGN	245-1418	+0
	*PREFERRED GLASS TNT	674-7429	9
505	*PAC CASTINGS ELSNOR	674-4315	
506	*STREAMLINED CABINTS	674-3735	5
600	*PAC WOODHAWK INC	674-7794	+0
609	*LAIDLAW TRANSIT INC	674-6967	6
610	*CROWBAR AUTO DSMNTL	674-7702	5
	*CROWBAR AUTO TOWING	674-4215	5
653	HARDING Robt	674-2918	3
	*RIGHTWAY TEMP POWER	674-2626	3
	*RIGHTWAY TOILETS	674-2708	1
1400	VELAZQUEZ Andres	674-3481	6

* 13 BUS 5 RES 4 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 1985

MINTHORN W 92330
LAKE ELSINORE

505	PAC CASTINGS ELSNOR	674-4315	
506	STREAMLINED CABINTS	674-3735	+5
600	XXXX	00	
609	A R A TRANSPORTATN	674-6967	+5
610	CROWBAR AUTO DSMNTL	674-7702	+5
	CROWBAR AUTO TOWING	674-4215	+5
653	HARDING ROBT	674-2918	3
	RIGHTWAY CHMCL TLT	674-2708	1
	RIGHTWAY SPTC TANK	674-6565	1
	RIGHTWAY TEMP POWER	674-2626	3
1400	RUIZ M B ROOFNG	674-5134	1

* 9 BUS 2 RES 4 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

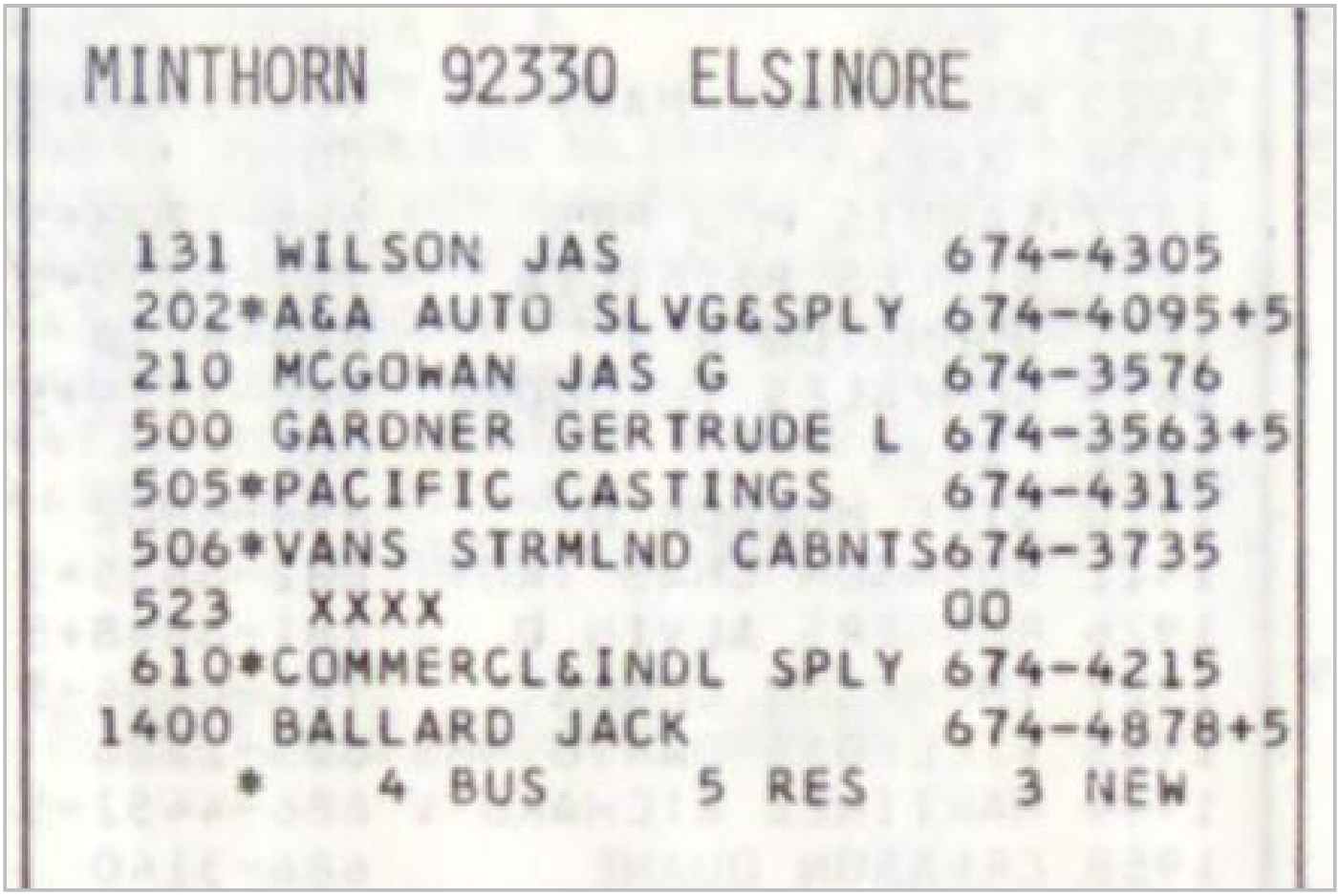
W MINTHORN ST 1980

MINTHORN 92330 LAKE ELSINORE

131	GERST FRED	674-3730	8
202 *	A&A AUTO SALVAGE	674-4095	5
*	CHUCKS PRCST CNCRTE	674-1353	+0
210	MCGOWAN JAMES G	674-3576	
500	XXXX	00	
505 *	PAC CASTNGS ELSNRE	674-4315	
506 *	VANS STRMLND CABNTS	674-3735	
523	XXXX	00	
524	LEPROHON STEVE	674-1370	9
600 *	CROWBAR ATO DSMNTLG	674-4215	+0
*	CROWBAR TOWING	674-4215	+0
606	REDDELL ROBERT K	674-5948	9
610	XXXX	00	
*	6 BUS 7 RES	3 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

W MINTHORN ST 1975



MINTHORN 92330 ELSINORE

131	WILSON JAS	674-4305
202*	A&A AUTO SLVG&SPLY	674-4095+5
210	MCGOWAN JAS G	674-3576
500	GARDNER GERTRUDE L	674-3563+5
505*	PACIFIC CASTINGS	674-4315
506*	VANS STRMLND CABNTS	674-3735
523	XXXX	OO
610*	COMMERCL&INDL SPLY	674-4215
1400	BALLARD JACK	674-4878+5

* 4 BUS 5 RES 3 NEW

3522

West Minthorn Street

Lake Elsinore, CA 92530

Inquiry Number: 5276026.9

April 30, 2018

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

04/30/18

Site Name:

3522
West Minthorn Street
Lake Elsinore, CA 92530
EDR Inquiry # 5276026.9

Client Name:

California Environmental
30423 Canwood Street Suite 208
Agoura Hills, CA 93012
Contact: Ryan Bzoskie

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	*Scale*	*Details*	*Source*
2014	1"=500'	Flight Year: 2014	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1994	1"=500'	Acquisition Date: June 01, 1994	USGS/DOQQ
1989	1"=500'	Flight Date: August 15, 1989	USDA
1985	1"=500'	Flight Date: February 24, 1985	USDA
1978	1"=500'	Flight Date: September 20, 1978	USDA
1967	1"=500'	Flight Date: May 15, 1967	USDA
1961	1"=500'	Flight Date: June 15, 1961	USDA
1953	1"=500'	Flight Date: September 22, 1953	USDA
1949	1"=500'	Flight Date: May 06, 1949	USDA
1938	1"=500'	Flight Date: June 14, 1938	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.


INQUIRY #: 5276026.9
YEAR: 2014
= 500'
N
EDR

INQUIRY #: 5276026.9

YEAR: 2010

= 500'

N

EDR


Legend
Chaney St
Google Earth
200 ft
N


INQUIRY #: 5276026.9
YEAR: 2005
= 500'
N
EDR

INQUIRY #: 5276026.9

YEAR: 1994

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 5276026.9
YEAR: 1989
= 500'
N
EDR

INQUIRY #: 5276026.9

YEAR: 1985

= 500'

N

EDR

INQUIRY #: 5276026.9

YEAR: 1978

= 500'

N

EDR


INQUIRY #: 5276026.9
YEAR: 1967
= 500'
N
EDR

INQUIRY #: 5276026.9

YEAR: 1961

= 500'

N

EDR

INQUIRY #: 5276026.9

YEAR: 1953

= 500'

N

EDR

INQUIRY #: 5276026.9

YEAR: 1949

= 500'

N

EDR

INQUIRY #: 5276026.9

YEAR: 1938

= 500'

N

EDR

3522
West Minthorn Street
Lake Elsinore, CA 92530

Inquiry Number: 5276026.3
April 30, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

04/30/18

Site Name:

3522
West Minthorn Street
Lake Elsinore, CA 92530
EDR Inquiry # 5276026.3

Client Name:

California Environmental
30423 Canwood Street Suite 208
Agoura Hills, CA 93012
Contact: Ryan Bzoskie

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by California Environmental were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # CFA3-4C8D-930E

PO # NA

Project 3522

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: CFA3-4C8D-930E

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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California Environmental (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

3522
West Minthorn Street
Lake Elsinore, CA 92530

Inquiry Number: 5276026.4
April 30, 2018

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

04/30/18

Site Name:

3522
West Minthorn Street
Lake Elsinore, CA 92530
EDR Inquiry # 5276026.4

Client Name:

California Environmental
30423 Canwood Street Suite 208
Agoura Hills, CA 93012
Contact: Ryan Bzoskie

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by California Environmental were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# NA
Project: 3522

Coordinates:

Latitude:	33.683134 33° 40' 59" North
Longitude:	-117.33432 -117° 20' 4" West
UTM Zone:	Zone 11 North
UTM X Meters:	469012.04
UTM Y Meters:	3727073.55
Elevation:	1276.44' above sea level

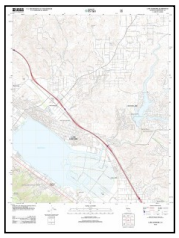
Maps Provided:

2012
1997
1988
1982
1978
1973
1953
1901

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

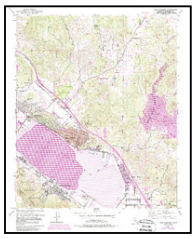


Lake Elsinore
2012
7.5-minute, 24000

1997 Source Sheets

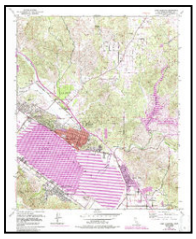
Lake Elsinore
1997
7.5-minute, 24000
Aerial Photo Revised 1994

1988 Source Sheets



Lake Elsinore
1988
7.5-minute, 24000
Aerial Photo Revised 1985

1982 Source Sheets



Lake Elsinore
1982
7.5-minute, 24000
Aerial Photo Revised 1980

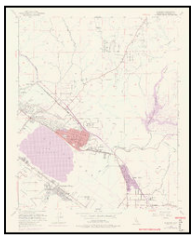
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1978 Source Sheets

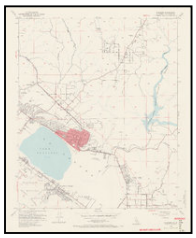
Lake Elsinore
1978
7.5-minute, 24000
Aerial Photo Revised 1978

1973 Source Sheets



Elsinore
1973
7.5-minute, 24000
Aerial Photo Revised 1973

1953 Source Sheets



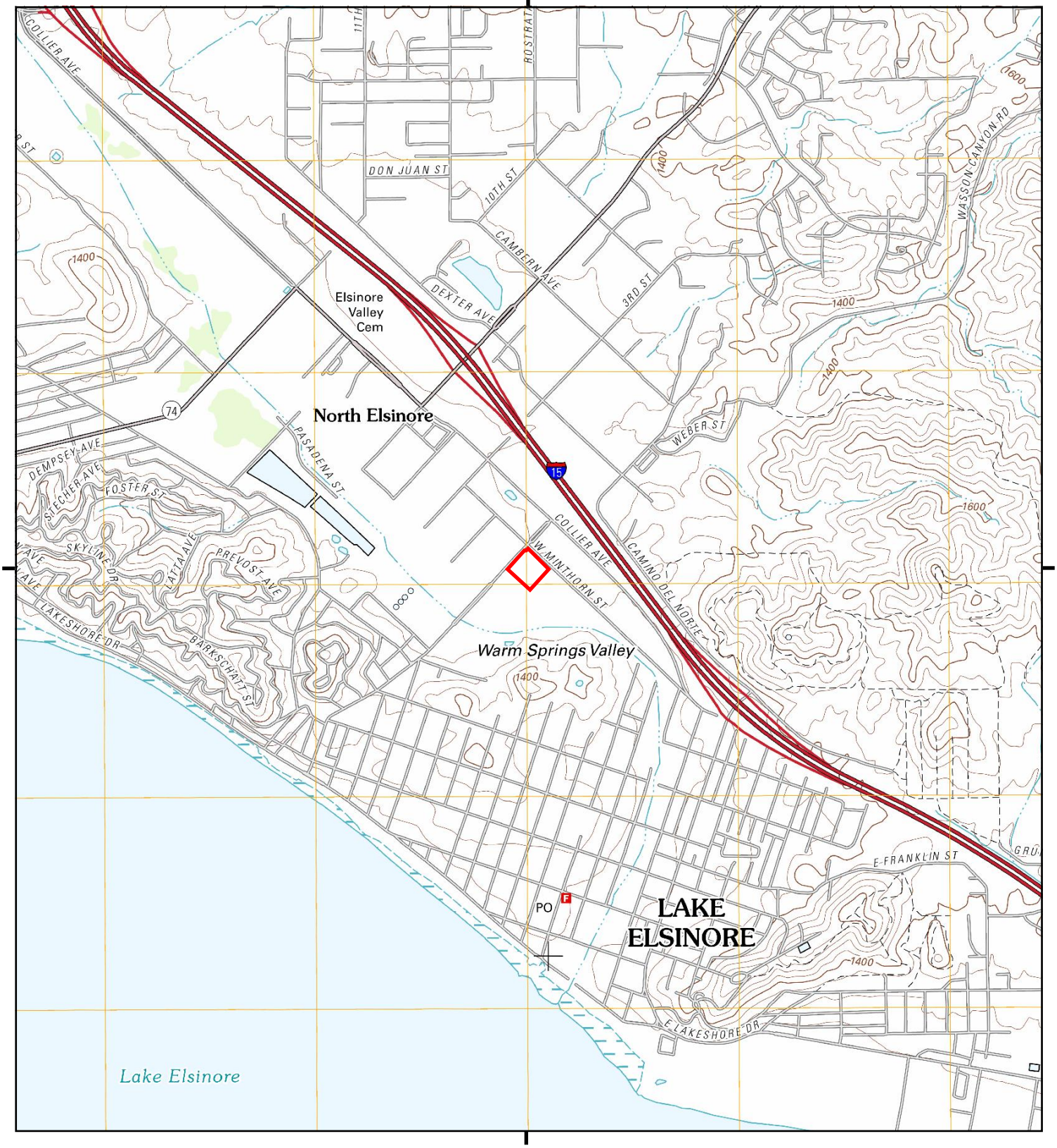
Elsinore
1953
7.5-minute, 24000
Aerial Photo Revised 1951

1901 Source Sheets

Elsinore
1901
30-minute, 125000

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Lake Elsinore, 2012, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

Historical Topo Map

1997

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

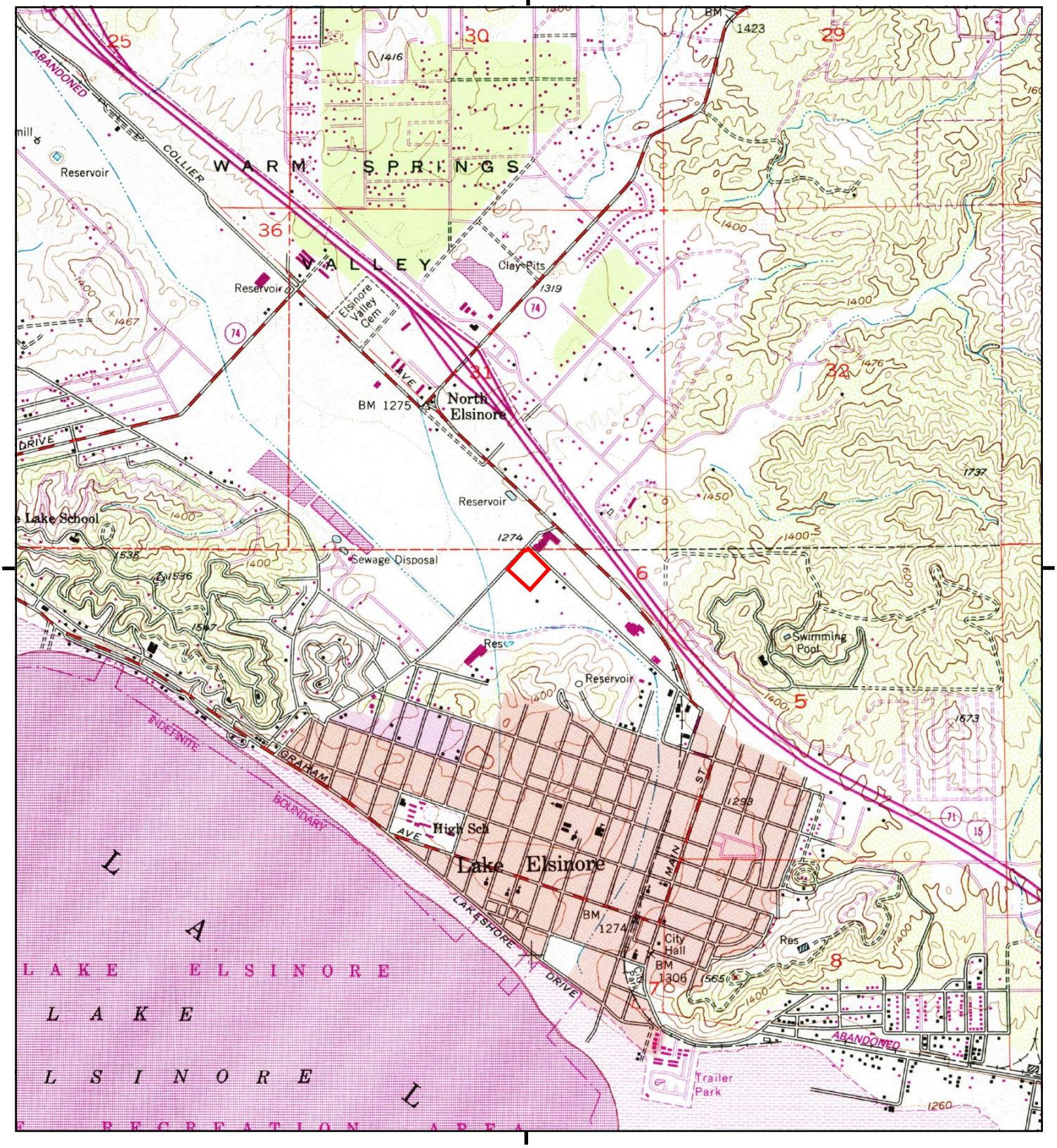
TP, Lake Elsinore, 1997, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

Historical Topo Map

1988



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

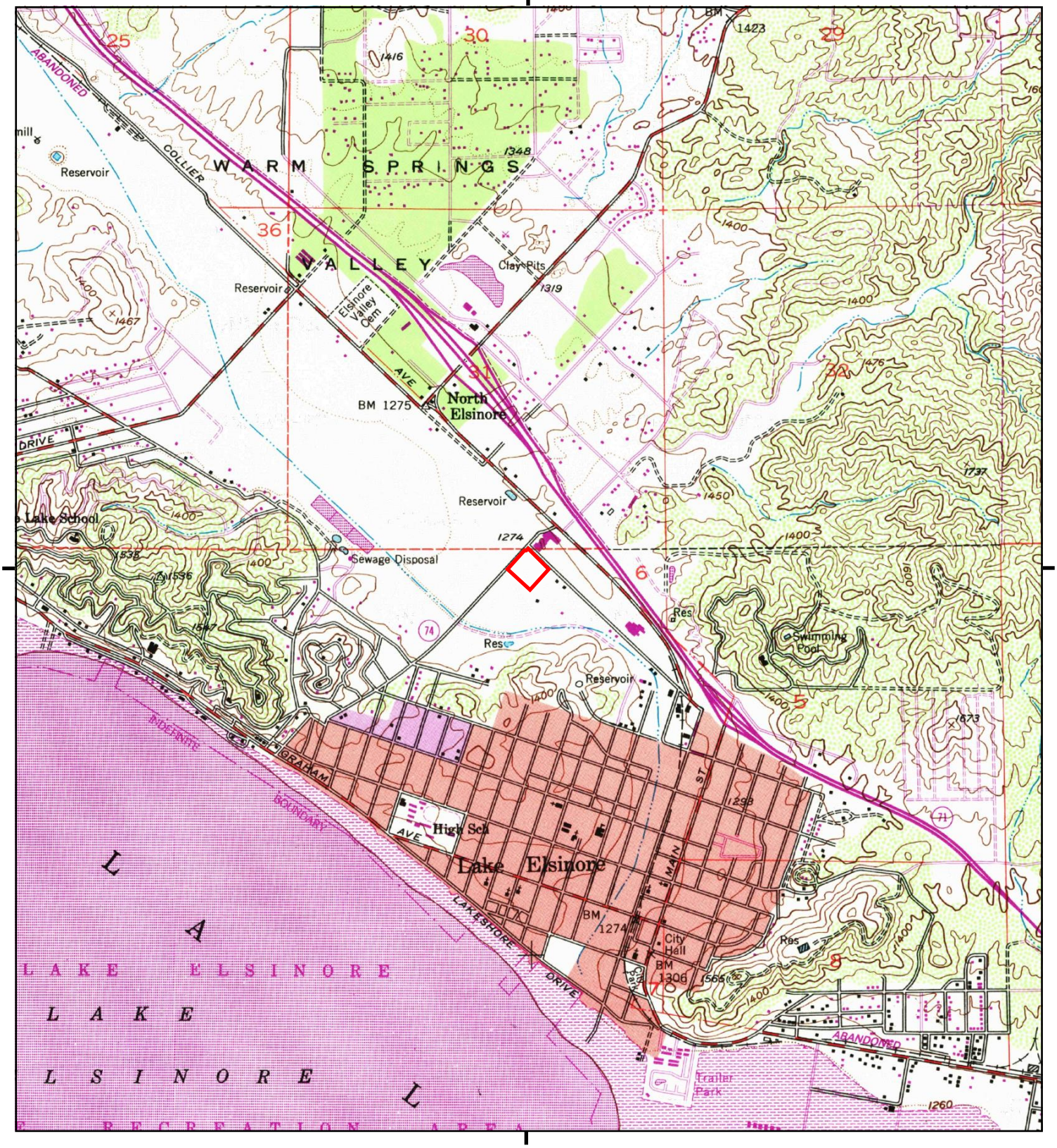
TP, Lake Elsinore, 1988, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

Historical Topo Map

1982



This report includes information from the following map sheet(s).

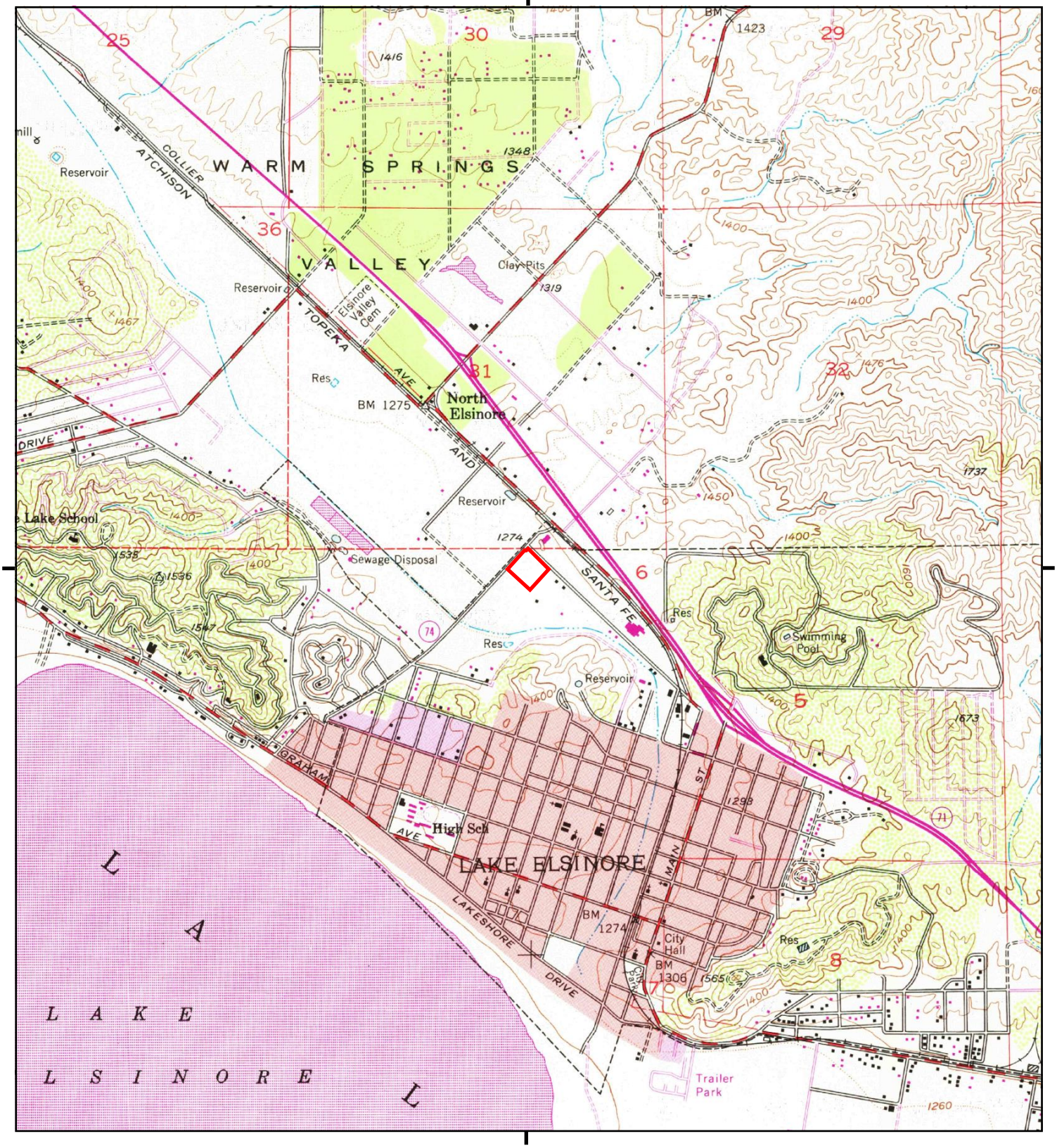
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Lake Elsinore, 1982, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N



This report includes information from the following map sheet(s).

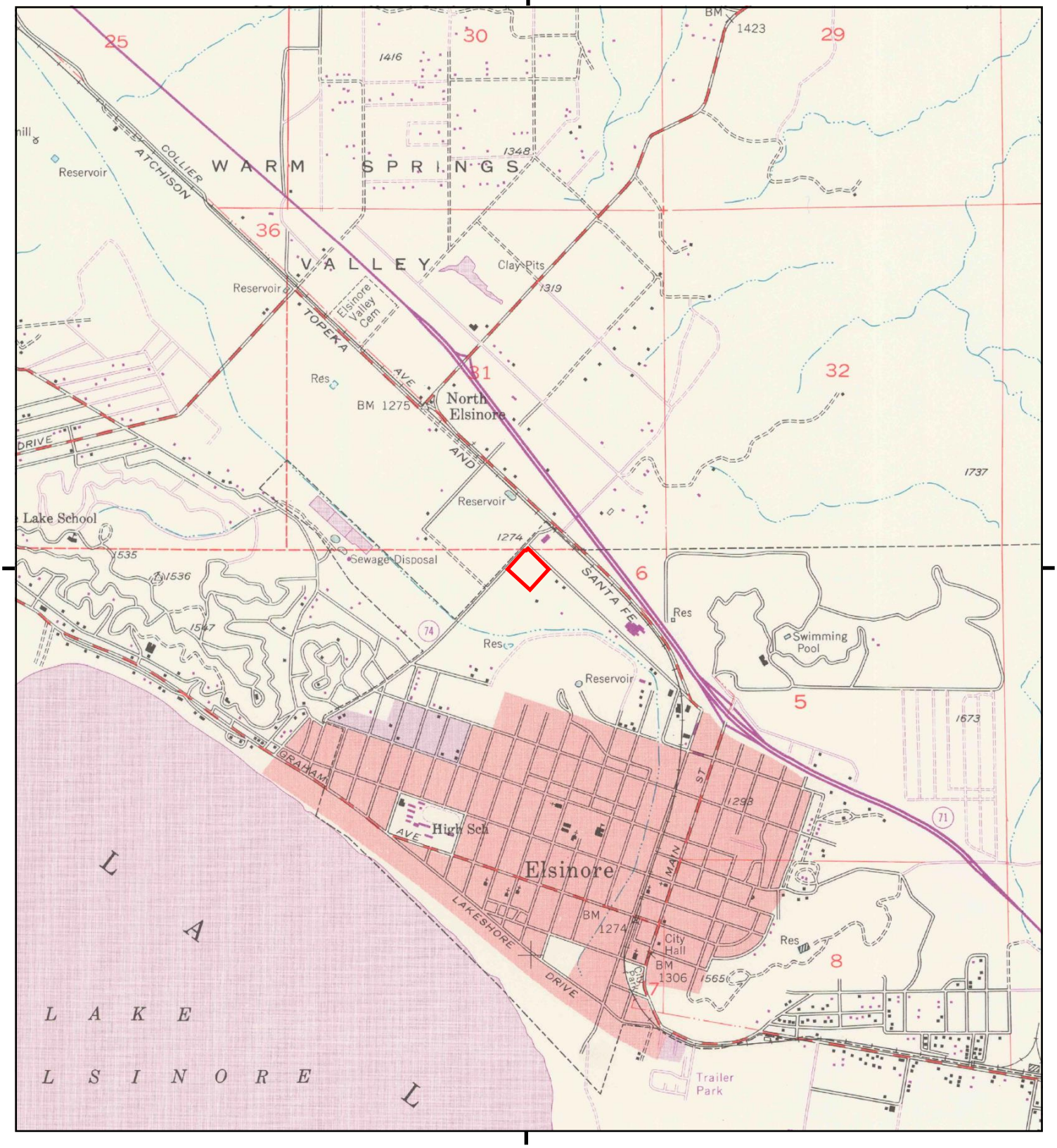
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Lake Elsinore, 1978, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

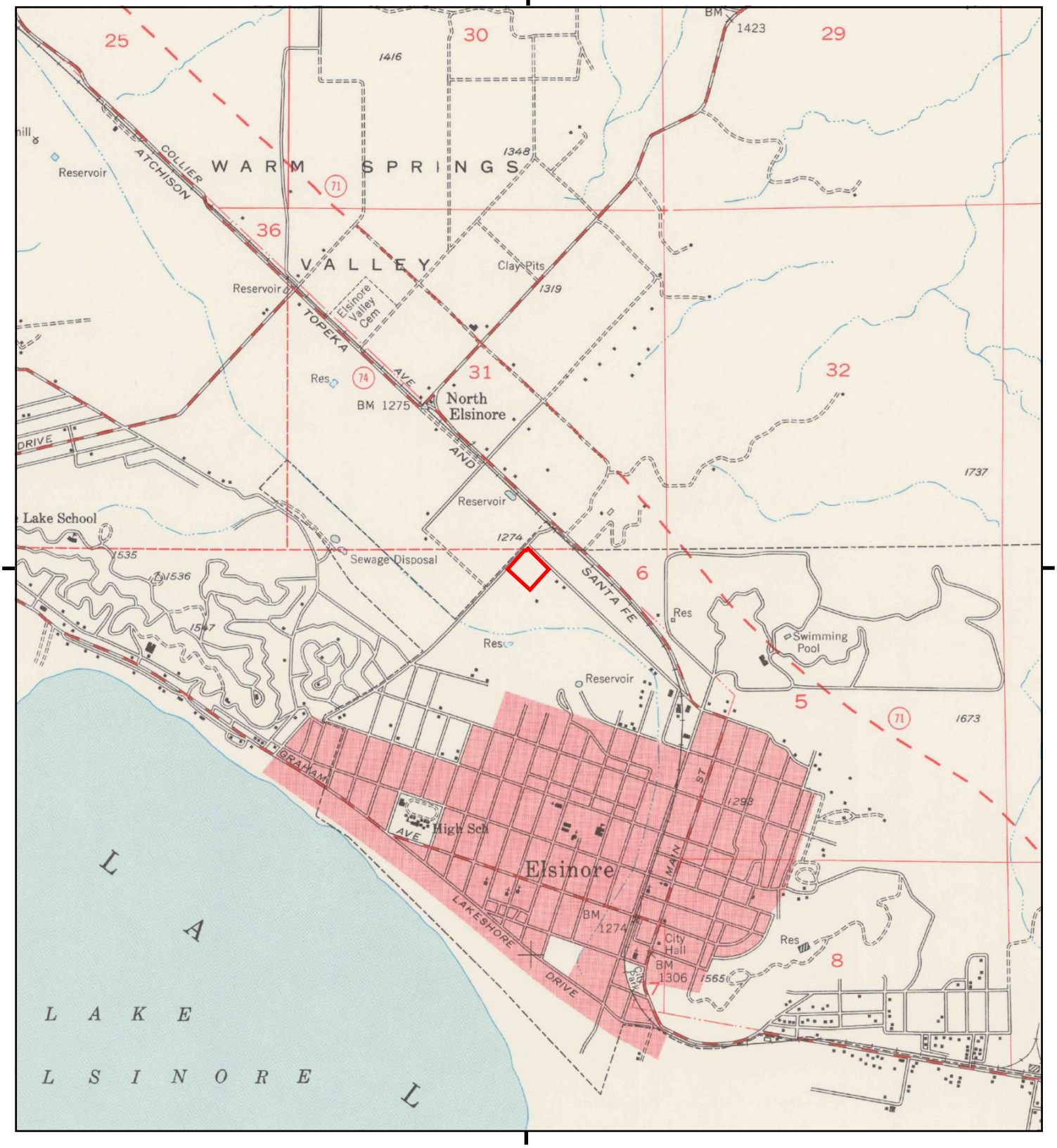
TP, Elsinore, 1973, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

Historical Topo Map

1953



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elsinore, 1953, 7.5-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elsinore, 1901, 30-minute

SITE NAME: 3522
ADDRESS: West Minthorn Street
Lake Elsinore, CA 92530
CLIENT: California Environmental

N

APPENDIX III

EDR Radius Map

3522
West Minthorn Street
Lake Elsinore, CA 92530

Inquiry Number: 5276026.2s
April 30, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

WEST MINTHORN STREET
LAKE ELSINORE, CA 92530

COORDINATES

Latitude (North):	33.6831340 - 33° 40' 59.28''
Longitude (West):	117.3343200 - 117° 20' 3.55''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	469011.3
UTM Y (Meters):	3726880.2
Elevation:	1277 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
WEST MINTHORN STREET
LAKE ELSINORE, CA 92530

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	DELEO CLAY TILE CO I	600 CHANEY ST	RCRA-SQG, FINDS, ECHO, EMI, NPDES, WDS	Higher	234, 0.044, NE
2	RIGHTWAY	653 W MINTHORN	LUST, HIST UST, RCRA NonGen / NLR, FINDS, ECHO,...	Higher	423, 0.080, ESE
3	HI TECH MECHANICAL S	18650 COLLIER AVE	RCRA-SQG, FINDS, ECHO	Higher	624, 0.118, NE
A4	BUTTERFIELD SURVEYS	18740 COLLIER AVE	SWEEPS UST, HIST UST, CA FID UST	Higher	667, 0.126, ENE
A5	BUTTERFIELD SURVEYS,	18740 COLLIER AVE	HIST UST	Higher	667, 0.126, ENE
B6	APPLITEC MFG	18630 COLLIER AVE ST	RCRA-SQG, FINDS, ECHO	Higher	747, 0.141, North
B7	FIRST PRIORITY PROPE	18630 COLLIER AVE	RCRA NonGen / NLR	Higher	747, 0.141, North
C8	ARA TRANSPORTATION I	609 MINTHORN AVE	HIST UST	Higher	798, 0.151, ESE
C9	ZIEMBAS AUTO	609 MINTHORN	RCRA-SQG, FINDS, ECHO	Higher	798, 0.151, ESE
C10	LAIDLAW TRANSIT / EL	609 MINTHORN	HIST UST	Higher	798, 0.151, ESE
C11	LAIDLAW TRANSIT	609 MINTHORN	LUST, HIST CORTESE	Higher	798, 0.151, ESE
12	ORANCO SWISS AUTOMAT	553 BIRCH ST	RCRA-SQG, FINDS, ECHO	Lower	923, 0.175, WNW
13	LAIDLAW TRANSIT	609 W MINTHORN ST	LUST	Lower	1287, 0.244, ESE
D14	LAKE ELSINORE CORPOR	521 LANGSTAFF	LUST, HIST CORTESE	Lower	2473, 0.468, SE
D15	CITY YARD	521 N LANGSTAFF ST	LUST, HIST UST	Lower	2473, 0.468, SE
16	ORTEGA HIGH SCHOOL/A	CHANEY STREET	ENVIROSTOR, SCH	Higher	2756, 0.522, SW
17	ELSINORE GAS CO GAS	RILEY AND FLINT STRE	EDR MGP	Lower	3243, 0.614, SE
18	SO CAL GAS/ELSINORE	CNR RILEY, FLINT, SP	ENVIROSTOR, VCP	Lower	3753, 0.711, SE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

EXECUTIVE SUMMARY

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
SLIC ---------- Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
UST ---------- Active UST Facilities
AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing
VCP ---------- Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ---------- Waste Management Unit Database
SWRCY ---------- Recycler Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
HIST Cal-Sites ---------- Historical Calsites Database

SCH ..... School Property Evaluation Program
CDL ..... Clandestine Drug Labs
Toxic Pits ..... Toxic Pits Cleanup Act Sites
US CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS ..... Environmental Liens Listing
LIENS 2 ..... CERCLA Lien Information
DEED ..... Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
CHMIRS ..... California Hazardous Material Incident Report System
LDS ..... Land Disposal Sites Listing
MCS ..... Military Cleanup Sites Listing
SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS ..... Formerly Used Defense Sites
DOD ..... Department of Defense Sites
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations
FUSRAP ..... Formerly Utilized Sites Remedial Action Program
UMTRA ..... Uranium Mill Tailings Sites
LEAD SMELTERS ..... Lead Smelter Sites
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
US MINES ..... Mines Master Index File
ABANDONED MINES ..... Abandoned Mines
FINDS ..... Facility Index System/Facility Registry System
UXO ..... Unexploded Ordnance Sites

EXECUTIVE SUMMARY

ECHO ---------- Enforcement & Compliance History Information
DOCKET HWC ---------- Hazardous Waste Compliance Docket Listing
FUELS PROGRAM ---------- EPA Fuels Program Registered Listing
CA BOND EXP. PLAN ---------- Bond Expenditure Plan
Cortese ---------- "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings ---------- CUPA Resources List
DRYCLEANERS ---------- Cleaner Facilities
EMI ---------- Emissions Inventory Data
ENF ---------- Enforcement Action Listing
Financial Assurance ---------- Financial Assurance Information Listing
HAZNET ---------- Facility and Manifest Data
ICE ---------- ICE
HWP ---------- EnviroStor Permitted Facilities Listing
HWT ---------- Registered Hazardous Waste Transporter Database
MINES ---------- Mines Site Location Listing
MWMP ---------- Medical Waste Management Program Listing
NPDES ---------- NPDES Permits Listing
PEST LIC ---------- Pesticide Regulation Licenses Listing
PROC ---------- Certified Processors Database
Notify 65 ---------- Proposition 65 Records
UIC ---------- UIC Listing
WASTEWATER PITS ---------- Oil Wastewater Pits Listing
WDS ---------- Waste Discharge System
WIP ---------- Well Investigation Program Case List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto ---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---------- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/11/2017 has revealed that there are 5 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DELEO CLAY TILE CO I	*600 CHANEY ST*	*NE 0 - 1/8 (0.044 mi.)*	*1*	*8*
HI TECH MECHANICAL S	*18650 COLLIER AVE*	*NE 0 - 1/8 (0.118 mi.)*	*3*	*20*
APPLITEC MFG	*18630 COLLIER AVE ST*	*N 1/8 - 1/4 (0.141 mi.)*	*B6*	*24*
ZIEMBAS AUTO	*609 MINTHORN*	*ESE 1/8 - 1/4 (0.151 mi.)*	*C9*	*27*
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
ORANCO SWISS AUTOMAT	*553 BIRCH ST*	*WNW 1/8 - 1/4 (0.175 mi.)*	*12*	*30*

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 01/30/2018 has revealed that there are 2 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ORTEGA HIGH SCHOOL/A Facility Id: 33010008 Status: No Further Action	*CHANEY STREET*	*SW 1/2 - 1 (0.522 mi.)*	*16*	*36*
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
SO CAL GAS/ELSINORE Facility Id: 33490082 Status: Certified	*CNR RILEY, FLINT, SP*	*SE 1/2 - 1 (0.711 mi.)*	*18*	*40*

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 5 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIGHTWAY	***653 W MINTHORN***	***ESE 0 - 1/8 (0.080 mi.)***	***2***	***16***
Database: LUST REG 8, Date of Government Version: 02/14/2005 Database: LUST, Date of Government Version: 03/12/2018 Status: Completed - Case Closed Facility Status: Case Closed Global Id: T0606500035 Global ID: T0606500035				
LAIDLAW TRANSIT	***609 MINTHORN***	***ESE 1/8 - 1/4 (0.151 mi.)***	***C11***	***29***
Database: LUST REG 8, Date of Government Version: 02/14/2005 Facility Status: Case Closed Global ID: T0606500097				

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAIDLAW TRANSIT	609 W MINTHORN ST	ESE 1/8 - 1/4 (0.244 mi.)	13	32
Database: LUST, Date of Government Version: 03/12/2018 Status: Completed - Case Closed Global Id: T0606500097				
LAKE ELSINORE CORPOR	***521 LANGSTAFF***	***SE 1/4 - 1/2 (0.468 mi.)***	***D14***	***33***
Database: LUST REG 8, Date of Government Version: 02/14/2005 Facility Status: Case Closed Global ID: T0606500084				
CITY YARD	***521 N LANGSTAFF ST***	***SE 1/4 - 1/2 (0.468 mi.)***	***D15***	***34***
Database: RIVERSIDE CO. LUST, Date of Government Version: 01/18/2018 Database: LUST, Date of Government Version: 03/12/2018 Status: Completed - Case Closed Facility Id: 88062 Global Id: T0606500084 Facility Status: 9				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is

1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BUTTERFIELD SURVEYS	***18740 COLLIER AVE***	***ENE 1/8 - 1/4 (0.126 mi.)***	***A4***	***22***
Status: A Tank Status: A Comp Number: 1694				

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 5 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIGHTWAY	***653 W MINTHORN***	***ESE 0 - 1/8 (0.080 mi.)***	***2***	***16***
Facility Id: 00000032940				
BUTTERFIELD SURVEYS	***18740 COLLIER AVE***	***ENE 1/8 - 1/4 (0.126 mi.)***	***A4***	***22***
BUTTERFIELD SURVEYS, Facility Id: 00000001694	18740 COLLIER AVE	ENE 1/8 - 1/4 (0.126 mi.)	A5	23
ARA TRANSPORTATION I Facility Id: 00000009822	609 MINTHORN AVE	ESE 1/8 - 1/4 (0.151 mi.)	C8	26
LAIDLAW TRANSIT / EL Facility Id: 00000046336	609 MINTHORN	ESE 1/8 - 1/4 (0.151 mi.)	C10	28

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BUTTERFIELD SURVEYS	***18740 COLLIER AVE***	***ENE 1/8 - 1/4 (0.126 mi.)***	***A4***	***22***
Facility Id: 33001881 Status: A				

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/11/2017 has revealed that there are 2 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIGHTWAY	***653 W MINTHORN***	***ESE 0 - 1/8 (0.080 mi.)***	***2***	***16***
FIRST PRIORITY PROPE	18630 COLLIER AVE	N 1/8 - 1/4 (0.141 mi.)	B7	25

EXECUTIVE SUMMARY

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there are 3 HIST CORTESE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RIGHTWAY Reg Id: 083300324T	***653 W MINTHORN***	***ESE 0 - 1/8 (0.080 mi.)***	***2***	***16***
LAIDLAW TRANSIT Reg Id: 08300978T	***609 MINTHORN***	***ESE 1/8 - 1/4 (0.151 mi.)***	***C11***	***29***

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKE ELSINORE CORPOR Reg Id: 083300791T	***521 LANGSTAFF***	***SE 1/4 - 1/2 (0.468 mi.)***	***D14***	***33***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the EDR MGP list, as provided by EDR, has revealed that there is 1 EDR MGP site within approximately 1 mile of the target property.

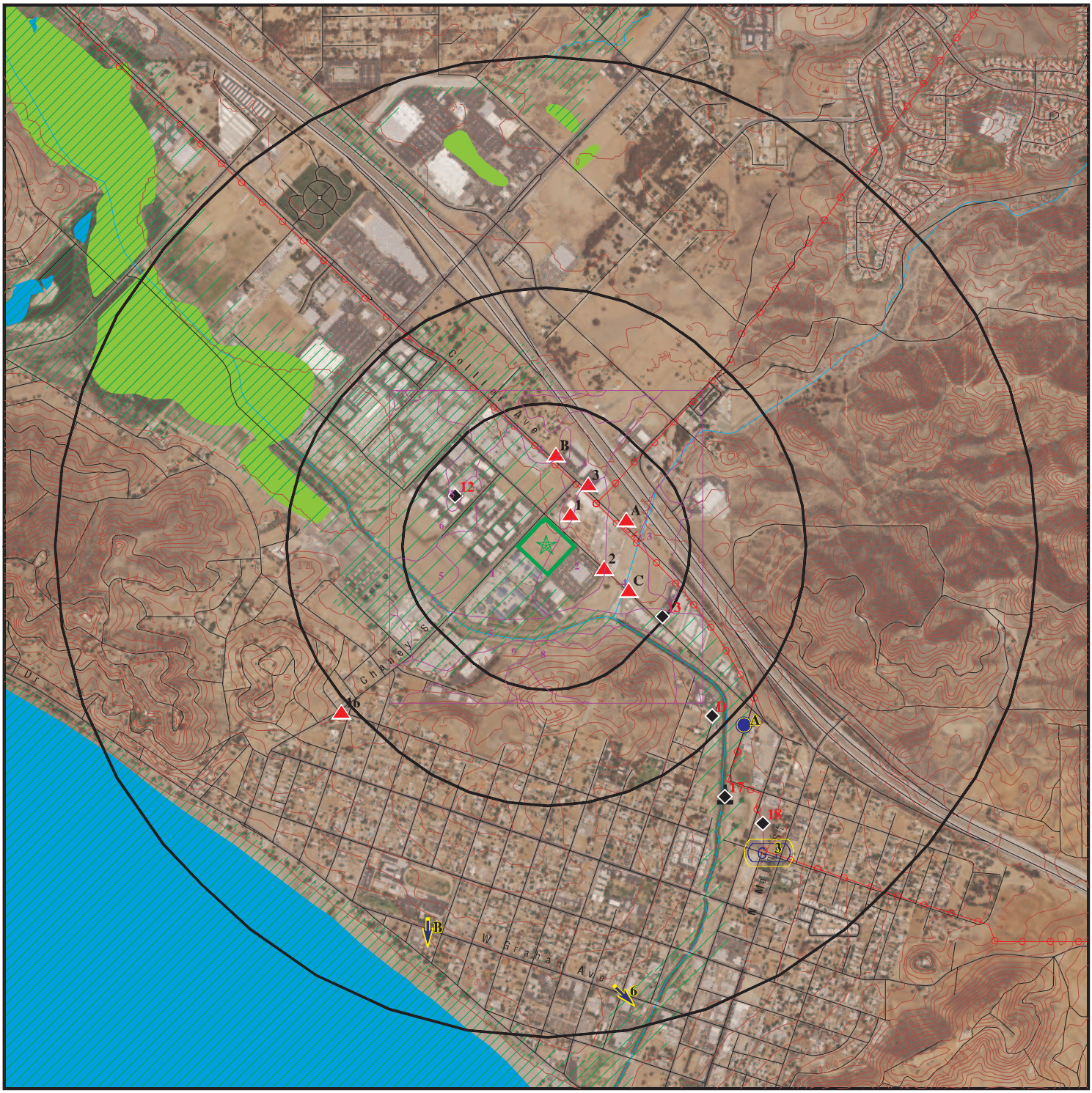
Lower Elevation	Address	Direction / Distance	Map ID	Page
ELSINORE GAS CO GAS	RILEY AND FLINT STRE	SE 1/2 - 1 (0.614 mi.)	17	40

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
SO CAL GAS/ELSINORE MGP	EDR MGP

OVERVIEW MAP - 5276026.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	3522	CLIENT:	California Environmental
ADDRESS:	West Minthorn Street Lake Elsinore CA 92530	CONTACT:	Ryan Bzoskie
		INQUIRY #:	5276026.2s
LAT/LONG:	33.683134 / 117.33432	DATE:	April 30, 2018 2:43 pm

DETAIL MAP - 5276026.2S

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

Areas of Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	3522	CLIENT:	California Environmental
ADDRESS:	West Minthorn Street Lake Elsinore CA 92530	CONTACT:	Ryan Bzoskie
LAT/LONG:	33.683134 / 117.33432	INQUIRY #:	5276026.2s
		DATE:	April 30, 2018 2:47 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		2	3	NR	NR	NR	5
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	2	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		1	2	2	NR	NR	5

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		1	4	NR	NR	NR	5
CA FID UST	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	TP		NR	NR	NR	NR	NR	0
LIENS 2	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	1	NR	NR	NR	2
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
ICE	TP		NR	NR	NR	NR	NR	0
HIST CORTESE	0.500		1	1	1	NR	NR	3
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PEST LIC	TP		NR	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	1	NR	1
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	6	13	3	3	0	25

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
NE
< 1/8
0.044 mi.
234 ft.

Relative:
Higher

Actual:
1282 ft.

DELEO CLAY TILE CO INC
600 CHANEY ST
LAKE ELSINORE, CA 92530

RCRA-SQG
FINDS
ECHO
EMI
NPDES
WDS

1000209131
CAD981568488

RCRA-SQG:

Date form received by agency:	09/01/1996
Facility name:	DELEO CLAY TILE CO INC
Facility address:	600 CHANEY ST LAKE ELSINORE, CA 92530
EPA ID:	CAD981568488
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	US
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Land type:	Facility is not located on Indian land. Additional information is not known.
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	JOE DELEO
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	415-555-1212
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	415-555-1212
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No

DELEO CLAY TILE CO INC (Continued) **1000209131**

Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:
Date form received by agency: 09/23/1986
Site name: DELEO CLAY TILE CO INC
Classification: Large Quantity Generator

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 08/28/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State Contractor/Grantee

FINDS:

Registry ID: 110070086312

Environmental Interest/Information System
US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Registry ID: 110001151011

Environmental Interest/Information System
AIR EMISSIONS CLASSIFICATION UNKNOWN

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

STATE MASTER

DELEO CLAY TILE CO INC (Continued) **1000209131**

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000209131
Registry ID:	110070086312
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110070086312

Envid:	1000209131
Registry ID:	110001151011
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110001151011

EMI:

Year:	1990
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	1
Carbon Monoxide Emissions Tons/Yr:	7
NOX - Oxides of Nitrogen Tons/Yr:	10
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	3
Part. Matter 10 Micrometers and Smllr Tons/Yr:	2

Year:	1993
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	5
NOX - Oxides of Nitrogen Tons/Yr:	3
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	1995
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported

DELEO CLAY TILE CO INC (Continued) **1000209131**

Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	5
NOX - Oxides of Nitrogen Tons/Yr:	3
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	1996
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	2
NOX - Oxides of Nitrogen Tons/Yr:	11
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	1997
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	1998
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0

DELEO CLAY TILE CO INC (Continued) **1000209131**

Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0
Year:	1999
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0
Year:	2000
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0
Year:	2001
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	5
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0
Year:	2002
County Code:	33
Air Basin:	SC

DELEO CLAY TILE CO INC (Continued) **1000209131**

Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2003
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	4
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2004
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.2479
Reactive Organic Gases Tons/Yr:	0.15
Carbon Monoxide Emissions Tons/Yr:	0.787
NOX - Oxides of Nitrogen Tons/Yr:	4.071
SOX - Oxides of Sulphur Tons/Yr:	0.01865
Particulate Matter Tons/Yr:	0.3502
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.32

Year:	2005
County Code:	33
Air Basin:	SC
Facility ID:	47771
Air District Name:	SC
SIC Code:	3251
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported

DELEO CLAY TILE CO INC (Continued) **1000209131**

Total Organic Hydrocarbon Gases Tons/Yr:	.173
Reactive Organic Gases Tons/Yr:	.0730406
Carbon Monoxide Emissions Tons/Yr:	.864
NOX - Oxides of Nitrogen Tons/Yr:	3.7
SOX - Oxides of Sulphur Tons/Yr:	.0148
Particulate Matter Tons/Yr:	.185
Part. Matter 10 Micrometers and Smllr Tons/Yr:	.185

NPDES:

Npdes Number:	Not reported
Facility Status:	Not reported
Agency Id:	Not reported
Region:	8
Regulatory Measure Id:	210863
Order No:	Not reported
Regulatory Measure Type:	Industrial
Place Id:	Not reported
WDID:	8 33I014321
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	10/10/2012
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
RECEIVED DATE:	05/09/2008
PROCESSED DATE:	07/02/1998
STATUS CODE NAME:	Terminated
STATUS DATE:	02/26/2013
PLACE SIZE:	5
PLACE SIZE UNIT:	Acres
FACILITY CONTACT NAME:	Lillian Cox
FACILITY CONTACT TITLE:	Not reported
FACILITY CONTACT PHONE:	951-674-1578
FACILITY CONTACT PHONE EXT:	Not reported
FACILITY CONTACT EMAIL:	Not reported
OPERATOR NAME:	Deleo Clay Tile Co
OPERATOR ADDRESS:	600 Chaney St
OPERATOR CITY:	Lake Elsinore
OPERATOR STATE:	California
OPERATOR ZIP:	92530
OPERATOR CONTACT NAME:	Cindy Deleo
OPERATOR CONTACT TITLE:	Not reported
OPERATOR CONTACT PHONE:	951-674-1578
OPERATOR CONTACT PHONE EXT:	Not reported
OPERATOR CONTACT EMAIL:	Not reported
OPERATOR TYPE:	Private Business
DEVELOPER NAME:	Not reported
DEVELOPER ADDRESS:	Not reported
DEVELOPER CITY:	Not reported
DEVELOPER STATE:	California
DEVELOPER ZIP:	Not reported
DEVELOPER CONTACT NAME:	Not reported
DEVELOPER CONTACT TITLE:	Not reported

DELEO CLAY TILE CO INC (Continued) **1000209131**

CONSTYPE LINEAR UTILITY IND:	Not reported
EMERGENCY PHONE NO:	951-674-1578
EMERGENCY PHONE EXT:	Not reported
CONSTYPE ABOVE GROUND IND:	Not reported
CONSTYPE BELOW GROUND IND:	Not reported
CONSTYPE CABLE LINE IND:	Not reported
CONSTYPE COMM LINE IND:	Not reported
CONSTYPE COMMERTIAL IND:	Not reported
CONSTYPE ELECTRICAL LINE IND:	Not reported
CONSTYPE GAS LINE IND:	Not reported
CONSTYPE INDUSTRIAL IND:	Not reported
CONSTYPE OTHER DESRIPTION:	Not reported
CONSTYPE OTHER IND:	Not reported
CONSTYPE RECONS IND:	Not reported
CONSTYPE RESIDENTIAL IND:	Not reported
CONSTYPE TRANSPORT IND:	Not reported
CONSTYPE UTILITY DESCRIPTION:	Not reported
CONSTYPE UTILITY IND:	Not reported
CONSTYPE WATER SEWER IND:	Not reported
DIR DISCHARGE USWATER IND:	Not reported
RECEIVING WATER NAME:	Lake Elsinore
CERTIFIER NAME:	Not reported
CERTIFIER TITLE:	Not reported
CERTIFICATION DATE:	Not reported
PRIMARY SIC:	3251-Brick and Structural Clay Tile
SECONDARY SIC:	Not reported
TERTIARY SIC:	Not reported

WDS:

Facility ID:	Santa Ana River 33I014321
Facility Type:	Not reported
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board
Subregion:	8
Facility Telephone:	Not reported
Facility Contact:	Not reported
Agency Name:	DELEO CLAY TILE CO
Agency Address:	Not reported
Agency City,St,Zip:	0
Agency Contact:	Not reported
Agency Telephone:	Not reported
Agency Type:	Not reported
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported

DELEO CLAY TILE CO INC (Continued) **1000209131**

Treat To Water: Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.

Complexity: Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

2
ESE
< 1/8
0.080 mi.
423 ft.

Relative:
Higher

Actual:
1280 ft.

RIGHTWAY **LUST** **1000244325**
653 W MINTHORN **HIST UST** **CAD092259407**
LAKE ELSINORE, CA 92530 **RCRA NonGen / NLR**
FINDS
ECHO
HIST CORTESE

LUST:

Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500035
Global Id:	T0606500035
Latitude:	33.683379
Longitude:	-117.33235
Status:	Completed - Case Closed
Status Date:	04/04/1989
Case Worker:	RIV
RB Case Number:	083300324T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

LUST:

Global Id:	T0606500035
Contact Type:	Local Agency Caseworker
Contact Name:	Riverside County LOP
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	Not reported
Phone Number:	9519558980

LUST:

Global Id:	T0606500035
Action Type:	Other
Date:	07/24/1986
Action:	Leak Reported

Global Id:	T0606500035
Action Type:	ENFORCEMENT
Date:	04/04/1989
Action:	Closure/No Further Action Letter

RIGHTWAY (Continued) **1000244325**

Global Id: T0606500035
Action Type: Other
Date: 07/24/1986
Action: Leak Discovery

LUST:
Global Id: T0606500035
Status: Open - Case Begin Date
Status Date: 07/24/1986

Global Id: T0606500035
Status: Open - Site Assessment
Status Date: 03/01/1987

Global Id: T0606500035
Status: Completed - Case Closed
Status Date: 04/04/1989

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083300324T
Local Case Num:	Not reported
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	CHANEY
Enf Type:	CLOS
Funding:	Not reported
How Discovered:	Tank Test
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	UNK
Global ID:	T0606500035
How Stopped Date:	Not reported
Enter Date:	12/31/1986
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	7/24/1986
Enforcement Date:	Not reported
Close Date:	4/4/1989
Date Prelim Assessment Workplan Submitted:	Not reported
Date Pollution Characterization Began:	3/1/1987
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	12/31/1986
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported

RIGHTWAY (Continued) **1000244325**

Oversite Program:	LUST
Latitude:	33.6797613
Longitude:	-117.3287658
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	PAH
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	UNNAMED BASIN
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

HIST UST:

File Number:	0001F8C7
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F8C7.pdf
Region:	STATE
Facility ID:	00000032940
Facility Type:	Other
Other Type:	SERVICE
Contact Name:	ROBERT M. HARDING
Telephone:	7146742708
Owner Name:	RIGHTWAY CHEMICAL TOILETS
Owner Address:	653 W. MINTHORN
Owner City,St,Zip:	LAKE ELSINORE, CA 92330
Total Tanks:	0003
Tank Num:	001
Container Num:	1
Year Installed:	1969
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	1979
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	1979
Tank Capacity:	00000550

RIGHTWAY (Continued) **1000244325**

Tank Used for: PRODUCT
Type of Fuel: REGULAR
Container Construction Thickness: Not reported
Leak Detection: None

Click here for Geo Tracker PDF:

RCRA NonGen / NLR:
Date form received by agency: 01/26/1981
Facility name: RIGHTWAY
Facility address: 653 W MINTHORN
LAKE ELSINORE, CA 92530
EPA ID: CAD092259407
Contact: ENVIRONMENTAL MANAGER
Contact address: 653 W MINTHORN
LAKE ELSINORE, CA 92330
Contact country: US
Contact telephone: 714-674-6565
Contact email: Not reported
EPA Region: 09
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: ROBERT M HARDING
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No

RIGHTWAY (Continued) **1000244325**

Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110006468107

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000244325
Registry ID: 110006468107
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110006468107

HIST CORTESE:
Region: CORTESE
Facility County Code: 33
Reg By: LTNKA
Reg Id: 083300324T

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3 **HI TECH MECHANICAL SERVICES** **RCRA-SQG** **1000398170**
NE **18650 COLLIER AVE** **FINDS** **CAD982481053**
< 1/8 **LAKE ELSINORE, CA 92530** **ECHO**
0.118 mi.
624 ft.

Relative:
Higher

Actual:
1288 ft.

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: HI TECH MECHANICAL SERVICES
Facility address: 18650 COLLIER AVE
LAKE ELSINORE, CA 92530
EPA ID: CAD982481053
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported

HI TECH MECHANICAL SERVICES (Continued) **1000398170**

Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: MIKE MAGRO
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 07/28/1988
Site name: HI TECH MECHANICAL SERVICES

HI TECH MECHANICAL SERVICES (Continued) **1000398170**

Classification: Large Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110006479435

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000398170
Registry ID: 110006479435
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110006479435

A4 **BUTTERFIELD SURVEYS INC** **SWEEPS UST** **S101589969**
ENE **18740 COLLIER AVE** **HIST UST** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330** **CA FID UST**
0.126 mi.
667 ft. **Site 1 of 2 in cluster A**

Relative: Higher

Actual: 1290 ft.

SWEEPS UST:
Status: Active
Comp Number: 1694
Number: 1
Board Of Equalization: 44-017871
Referral Date: 09-09-91
Action Date: 09-09-91
Created Date: 02-29-88
Owner Tank Id: 000200
SWRCB Tank Id: 33-000-001694-000001
Tank Status: A
Capacity: 1000
Active Date: 09-09-91
Tank Use: M.V. FUEL
STG: P
Content: LEADED
Number Of Tanks: 1

HIST UST:
File Number: 0001F455
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F455.pdf
Region: Not reported
Facility ID: Not reported
Facility Type: Not reported
Other Type: Not reported
Contact Name: Not reported

BUTTERFIELD SURVEYS INC (Continued) **S101589969**

Telephone:	Not reported
Owner Name:	Not reported
Owner Address:	Not reported
Owner City,St,Zip:	Not reported
Total Tanks:	Not reported
Tank Num:	Not reported
Container Num:	Not reported
Year Installed:	Not reported
Tank Capacity:	Not reported
Tank Used for:	Not reported
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Not reported

Click here for Geo Tracker PDF:

CA FID UST:

Facility ID:	33001881
Regulated By:	UTNKA
Regulated ID:	00001694
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7146741381
Mail To:	Not reported
Mailing Address:	18740 COLLIER AVE
Mailing Address 2:	Not reported
Mailing City,St,Zip:	LAKE ELSINORE 92330
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported
NPDES Number:	Not reported
EPA ID:	Not reported
Comments:	Not reported
Status:	Active

A5 **BUTTERFIELD SURVEYS, INC.** **HIST UST** **U001574764**
ENE **18740 COLLIER AVE** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.126 mi.
667 ft. **Site 2 of 2 in cluster A**

Relative: **Higher**
Actual: **1290 ft.**

HIST UST:

File Number:	Not reported
URL:	Not reported
Region:	STATE
Facility ID:	00000001694
Facility Type:	Other
Other Type:	LAND SURVEYING
Contact Name:	Not reported
Telephone:	7146741381
Owner Name:	BUTTERFIELD SURVEYS, INC.
Owner Address:	620 WEST GRAHAM
Owner City,St,Zip:	LAKE ELSINORE, CA 92330
Total Tanks:	0001
Tank Num:	001

BUTTERFIELD SURVEYS, INC. (Continued) **U001574764**

Container Num:	#1
Year Installed:	1973
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

B6 **APPLITEC MFG** **RCRA-SQG 1000905485**
North **18630 COLLIER AVE STE I** **FINDS CA0000755066**
1/8-1/4 **LAKE ELSINORE, CA 92530** **ECHO**
0.141 mi.
747 ft. **Site 1 of 2 in cluster B**

Relative:
Higher

Actual:
1282 ft.

RCRA-SQG:

Date form received by agency:	09/16/1994
Facility name:	APPLITEC MFG
Facility address:	18630 COLLIER AVE STE I LAKE ELSINORE, CA 92530
EPA ID:	CA0000755066
Mailing address:	COLLIER AVE STE I LAKE ELSINORE, CA 92530
Contact:	FRANK HARTON
Contact address:	18630 COLLIER AVE STE I LAKE ELSINORE, CA 92530
Contact country:	US
Contact telephone:	909-245-8800
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	FRANK HARTON
Owner/operator address:	18630 COLLIER AVE STE I LAKE ELSINORE, CA 92530
Owner/operator country:	Not reported
Owner/operator telephone:	909-245-8800
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No

APPLITEC MFG (Continued) **1000905485**

On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Violation Status: No violations found

FINDS:

Registry ID: 110002619872

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000905485
Registry ID:	110002619872
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110002619872

B7 **FIRST PRIORITY PROPERTY PRESERVATION LLC** **RCRA NonGen / NLR** **1012176240**
North **18630 COLLIER AVE** **CAR000201392**
1/8-1/4 **LAKE ELSINORE, CA 92530**
0.141 mi.
747 ft. **Site 2 of 2 in cluster B**

Relative:
Higher

Actual:
1282 ft.

RCRA NonGen / NLR:

Date form received by agency:	07/08/2009
Facility name:	FIRST PRIORITY PROPERTY PRESERVATION LLC
Facility address:	18630 COLLIER AVE UNIT D LAKE ELSINORE, CA 92530
EPA ID:	CAR000201392
Mailing address:	25060 HANCOCK AVE STE 103 120 MURRIETA, CA 92562
Contact:	SHAWN M WILSON
Contact address:	25060 HANCOCK AVE STE 103 120 MURRIETA, CA 92562
Contact country:	US
Contact telephone:	619-518-8552
Contact email:	WEBMASTER@FIRSTPRIORITYPROPERTYPRESERVATION.COM
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

FIRST PRIORITY PROPERTY PRESERVATION LLC (Continued) **1012176240**

Owner/Operator Summary:
Owner/operator name: PUCCIO PROPERTIES
Owner/operator address: PO BOX 15245
SANTA ANNA, CA 92735
Owner/operator country: US
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 06/12/2006
Owner/Op end date: Not reported

Owner/operator name: FIRST PRIORITY PROPERTY PRESERVATION
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 03/01/2009
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: Yes

Violation Status: No violations found

C8 **ARA TRANSPORTATION INC** **HIST UST** **U001574763**
ESE **609 MINTHORN AVE** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.151 mi.
798 ft. **Site 1 of 4 in cluster C**

Relative: HIST UST:
Higher
File Number: 0001F413
Actual: URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F413.pdf
1280 ft. Region: STATE
Facility ID: 00000009822
Facility Type: Other

ARA TRANSPORTATION INC (Continued) **U001574763**

Other Type:	TRANSPORTATION
Contact Name:	KANOE COCKETT
Telephone:	7146828710
Owner Name:	ART NELSON, INC.
Owner Address:	15403 GRAND AVE.
Owner City,St,Zip:	LAKE ELSINORE, CA 92330
Total Tanks:	0001
Tank Num:	001
Container Num:	UL#64795
Year Installed:	1983
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	1/4
Leak Detection:	None

Click here for Geo Tracker PDF:

C9 **ZIEMBAS AUTO** **RCRA-SQG** **1000880967**
ESE **609 MINTHORN** **FINDS** **CAD982317299**
1/8-1/4 **LAKE ELSINORE, CA 92530** **ECHO**
0.151 mi.
798 ft. **Site 2 of 4 in cluster C**

Relative:
Higher

Actual:
1280 ft.

RCRA-SQG:

Date form received by agency:	07/12/1993
Facility name:	ZIEMBAS AUTO
Facility address:	609 MINTHORN LAKE ELSINORE, CA 92530
EPA ID:	CAD982317299
Mailing address:	MINTHORN LAKE ELSINORE, CA 92530
Contact:	ED ZIEMBA
Contact address:	609 MINTHORN LAKE ELSINORE, CA 92530
Contact country:	US
Contact telephone:	909-674-5075
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	ED ZIEMBA
Owner/operator address:	609 MINTHORN LAKE ELSINORE, CA 92530
Owner/operator country:	Not reported
Owner/operator telephone:	909-674-5075
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private

ZIEMBAS AUTO (Continued) **1000880967**

Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002792274

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000880967
Registry ID: 110002792274
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110002792274

C10 **LAIDLAW TRANSIT / ELSINORE DIV** **HIST UST** **1000189935**
ESE **609 MINTHORN** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.151 mi.
798 ft. **Site 3 of 4 in cluster C**

Relative:
Higher

Actual:
1280 ft.

HIST UST:
File Number: 0001F7A3
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0001F7A3.pdf
Region: STATE
Facility ID: 00000046336
Facility Type: Other
Other Type: Not reported

LAIDLAW TRANSIT / ELSINORE DIV (Continued) **1000189935**

Contact Name:	GARY ROSENFELD DOUG MAGNUSON
Telephone:	7146746967
Owner Name:	LAIDLAW TRANSIT INC.
Owner Address:	14801 CALIFA ST. P.O. BOX 9133
Owner City,St,Zip:	VAN NUYS, CA 91409
Total Tanks:	0001
Tank Num:	001
Container Num:	1
Year Installed:	1983
Tank Capacity:	00010000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	1/4"
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

C11 **LAIDLAW TRANSIT** **LUST** **S103975772**
ESE **609 MINTHORN** **HIST CORTESE** **N/A**
1/8-1/4 **LAKE ELSINORE, CA 92330**
0.151 mi.
798 ft. **Site 4 of 4 in cluster C**

Relative: **Higher**

Actual: **1280 ft.**

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083300978T
Local Case Num:	Not reported
Case Type:	Soil only
Substance:	Heater Fuel
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	COLLIER
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	Corrosion
Leak Source:	Tank
Global ID:	T0606500097
How Stopped Date:	Not reported
Enter Date:	8/1/1988
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	3/2/1988
Enforcement Date:	Not reported
Close Date:	4/4/1989
Date Prelim Assessment Workplan Submitted:	Not reported
Date Pollution Characterization Began:	8/11/1988
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	8/1/1988
GW Qualifies:	Not reported
Soil Qualifies:	Not reported

LAIDLAW TRANSIT (Continued) **S103975772**

Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.6795353
Longitude:	-117.3284738
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	0
MTBE Tested:	Not Required to be Tested.
MTBE Class:	*
Staff:	PAH
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	UNNAMED BASIN
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	08300978T

12
WNW
1/8-1/4
0.175 mi.
923 ft.

ORANCO SWISS AUTOMATICS **RCRA-SQG 1000905502**
553 BIRCH ST **FINDS CA0000774232**
LAKE ELSINORE, CA 92530 **ECHO**

Relative:
Lower

Actual:
1266 ft.

RCRA-SQG:

Date form received by agency:	09/15/1994
Facility name:	ORANCO SWISS AUTOMATICS
Facility address:	553 BIRCH ST LAKE ELSINORE, CA 92530
EPA ID:	CA0000774232
Mailing address:	BIRCH ST LAKE ELSINORE, CA 92530
Contact:	MARK CANADA
Contact address:	553 BIRCH ST LAKE ELSINORE, CA 92530
Contact country:	US
Contact telephone:	909-245-2898
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

ORANCO SWISS AUTOMATICS (Continued) **1000905502**

Owner/Operator Summary:
- Owner/operator name: MARK CANADA
- Owner/operator address: 553 BIRCH ST
  LAKE ELSINORE, CA 92530
- Owner/operator country: Not reported
- Owner/operator telephone: 909-245-2898
- Owner/operator email: Not reported
- Owner/operator fax: Not reported
- Owner/operator extension: Not reported
- Legal status: Private
- Owner/Operator Type: Owner
- Owner/Op start date: Not reported
- Owner/Op end date: Not reported

Handler Activities Summary:
- U.S. importer of hazardous waste: No
- Mixed waste (haz. and radioactive): No
- Recycler of hazardous waste: No
- Transporter of hazardous waste: No
- Treater, storer or disposer of HW: No
- Underground injection activity: No
- On-site burner exemption: No
- Furnace exemption: No
- Used oil fuel burner: No
- Used oil processor: No
- User oil refiner: No
- Used oil fuel marketer to burner: No
- Used oil Specification marketer: No
- Used oil transfer facility: No
- Used oil transporter: No

Violation Status: No violations found

FINDS:

Registry ID: 110002620003

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
- Envid: 1000905502
- Registry ID: 110002620003
- DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110002620003

13
ESE
1/8-1/4
0.244 mi.
1287 ft.

LAIDLAW TRANSIT
609 W MINTHORN ST
LAKE ELSINORE, CA 92330

LUST **S109284846**
N/A

Relative:
Lower

Actual:
1275 ft.

LUST:

Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500097
Global Id:	T0606500097
Latitude:	33.681359
Longitude:	-117.329771
Status:	Completed - Case Closed
Status Date:	04/04/1989
Case Worker:	RIV
RB Case Number:	083300978T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Heating Oil / Fuel Oil
Site History:	Not reported

LUST:

Global Id:	T0606500097
Contact Type:	Regional Board Caseworker
Contact Name:	PATRICIA HANNON
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	phannon@waterboards.ca.gov
Phone Number:	Not reported

Global Id:	T0606500097
Contact Type:	Local Agency Caseworker
Contact Name:	Riverside County LOP
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	Not reported
Phone Number:	9519558980

LUST:

Global Id:	T0606500097
Action Type:	Other
Date:	03/02/1988
Action:	Leak Discovery

Global Id:	T0606500097
Action Type:	Other
Date:	06/02/1988
Action:	Leak Reported

LUST:

Global Id:	T0606500097
Status:	Open - Case Begin Date
Status Date:	03/02/1988

LAIDLAW TRANSIT (Continued) **S109284846**

Global Id:	T0606500097
Status:	Open - Site Assessment
Status Date:	08/11/1988
Global Id:	T0606500097
Status:	Completed - Case Closed
Status Date:	04/04/1989

D14 **LAKE ELSINORE CORPORATE Y** **LUST** **S102432457**
SE **521 LANGSTAFF** **HIST CORTESE** **N/A**
1/4-1/2 **LAKE ELSINORE, CA 92330**
0.468 mi.
2473 ft. **Site 1 of 2 in cluster D**

Relative: **Lower**
Actual: **1272 ft.**

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083300791T
Local Case Num:	88062
Case Type:	Aquifer affected
Substance:	Diesel
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	FLINT
Enf Type:	CLOS
Funding:	State Funds
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	Overfill
Leak Source:	UNK
Global ID:	T0606500084
How Stopped Date:	Not reported
Enter Date:	3/25/1988
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	12/9/1987
Enforcement Date:	Not reported
Close Date:	10/30/1989
Date Prelim Assessment Workplan Submitted:	Not reported
Date Pollution Characterization Began:	3/25/1988
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	3/25/1988
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.6764264
Longitude:	-117.3286907
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0

LAKE ELSINORE CORPORATE Y (Continued) **S102432457**

Max MTBE Soil:	Not reported
MTBE Fuel:	0
MTBE Tested:	Not Required to be Tested.
MTBE Class:	*
Staff:	PAH
Staff Initials:	UNK
Lead Agency:	Regional Board
Local Agency:	33000L
Hydr Basin #:	UNNAMED BASIN
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

HIST CORTESE:

Region:	CORTESE
Facility County Code:	33
Reg By:	LTNKA
Reg Id:	083300791T

D15 **CITY YARD** **LUST U001574765**
SE **521 N LANGSTAFF ST** **HIST UST N/A**
1/4-1/2 **LAKE ELSINORE, CA 92330**
0.468 mi.
2473 ft. **Site 2 of 2 in cluster D**

Relative:
Lower

Actual:
1272 ft.

LUST:

Lead Agency:	RIVERSIDE COUNTY LOP
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500084
Global Id:	T0606500084
Latitude:	33.6784156442241
Longitude:	-117.328427105557
Status:	Completed - Case Closed
Status Date:	10/30/1989
Case Worker:	RIV
RB Case Number:	083300791T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Local Agency Warehouse
Local Case Number:	88062
Potential Media Affect:	Aquifer used for drinking water supply
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

LUST:

Global Id:	T0606500084
Contact Type:	Local Agency Caseworker
Contact Name:	Riverside County LOP
Organization Name:	RIVERSIDE COUNTY LOP
Address:	3880 LEMON ST SUITE 200
City:	RIVERSIDE
Email:	Not reported
Phone Number:	9519558980

LUST:

Global Id:	T0606500084

CITY YARD (Continued) **U001574765**

Action Type: Other
Date: 12/09/1987
Action: Leak Discovery

Global Id: T0606500084
Action Type: ENFORCEMENT
Date: 10/30/1989
Action: Closure/No Further Action Letter

Global Id: T0606500084
Action Type: ENFORCEMENT
Date: 03/08/2009
Action: File review - #RCDEH Upload Site File 6/8/2010

Global Id: T0606500084
Action Type: Other
Date: 01/05/1988
Action: Leak Reported

Global Id: T0606500084
Action Type: ENFORCEMENT
Date: 03/09/2009
Action: Closure/No Further Action Letter - #Site Closure

LUST:
Global Id: T0606500084
Status: Open - Case Begin Date
Status Date: 12/09/1987

Global Id: T0606500084
Status: Open - Site Assessment
Status Date: 03/25/1988

Global Id: T0606500084
Status: Completed - Case Closed
Status Date: 10/30/1989

RIVERSIDE CO. LUST:
Region: RIVERSIDE
Facility ID: 88062
Employee: Rogers
Site Closed: Yes
Case Type: Soil only
Facility Status: closed/action completed
Casetype Decode: Soil only is impacted
Fstatus Decode: Closed/Action completed

HIST UST:
File Number: Not reported
URL: Not reported
Region: STATE
Facility ID: 00000066066
Facility Type: Other
Other Type: CITY
Contact Name: RAY NELSON

CITY YARD (Continued) **U001574765**

Telephone:	7146745170
Owner Name:	CITY OF LAKE ELSINORE
Owner Address:	130 S. MAIN STREET
Owner City,St,Zip:	LAKE ELSINORE, CA 92330
Total Tanks:	0003
Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00003000
Tank Used for:	WASTE
Type of Fuel:	4
Container Construction Thickness:	X
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None

---

16 **ORTEGA HIGH SCHOOL/ALTERNATIVE EDUCATION** **ENVIROSTOR** **S107736971**
SW **CHANEY STREET** **SCH** **N/A**
1/2-1 **LAKE ELSINORE, CA 92530**
0.522 mi.
2756 ft.

Relative:
Higher

Actual:
1315 ft.

ENVIROSTOR:

Facility ID:	33010008
Status:	No Further Action
Status Date:	06/09/2000
Site Code:	400811
Site Type:	School Investigation
Site Type Detailed:	School
Acres:	10.14
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Mark Malinowski
Division Branch:	Southern California Schools & Brownfields Outreach
Assembly:	67
Senate:	28
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED

ORTEGA HIGH SCHOOL/ALTERNATIVE EDUCATION (Continued) **S107736971**

Funding: School District
Latitude: 33.67795
Longitude: -117.3420
APN: NONE SPECIFIED
Past Use: AGRICULTURAL - ROW CROPS
Potential COC: Total Chromium (1:6 ratio Cr VI:Cr III DDT Barium and compounds Lead Vanadium and compounds
Confirmed COC: NONE SPECIFIED
Potential Description: SOIL
Alias Name: LAKE ELSINORE UNIFIED SCHOOL DISTRICT
Alias Type: Alternate Name
Alias Name: LAKE ELSINORE USD-ORTEGA HS
Alias Type: Alternate Name
Alias Name: LAKE ELSINORE USD-ORTEGA HS/VCA
Alias Type: Alternate Name
Alias Name: ORTEGA HIGH SCHOOL
Alias Type: Alternate Name
Alias Name: 400787
Alias Type: Project Code (Site Code)
Alias Name: 400811
Alias Type: Project Code (Site Code)
Alias Name: 33010008
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 01/25/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/09/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 10/21/1999
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/14/2000
Comments: Phase I used for background information.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Workplan
Completed Date: 03/03/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo

ORTEGA HIGH SCHOOL/ALTERNATIVE EDUCATION (Continued) **S107736971**

Completed Date:	04/22/2003
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Inspections/Visit (Non LUR)
Completed Date:	01/28/2000
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	11/17/1999
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

SCH:

Facility ID:	33010008
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	10.14
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Not reported
Supervisor:	Mark Malinowski
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	400811
Assembly:	67
Senate:	28
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	06/09/2000
Restricted Use:	NO
Funding:	School District
Latitude:	33.67795
Longitude:	-117.3420
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	Total Chromium (1:6 ratio Cr VI:Cr III, Total Chromium (1:6 ratio Cr VI:Cr III, DDT, Barium and compounds, Lead, Vanadium and compounds
Confirmed COC:	NONE SPECIFIED
Potential Description:	SOIL
Alias Name:	LAKE ELSINORE UNIFIED SCHOOL DISTRICT
Alias Type:	Alternate Name

ORTEGA HIGH SCHOOL/ALTERNATIVE EDUCATION (Continued) **S107736971**

Alias Name: LAKE ELSINORE USD-ORTEGA HS
Alias Type: Alternate Name
Alias Name: LAKE ELSINORE USD-ORTEGA HS/VCA
Alias Type: Alternate Name
Alias Name: ORTEGA HIGH SCHOOL
Alias Type: Alternate Name
Alias Name: 400787
Alias Type: Project Code (Site Code)
Alias Name: 400811
Alias Type: Project Code (Site Code)
Alias Name: 33010008
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 01/25/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/09/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 10/21/1999
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 02/14/2000
Comments: Phase I used for background information.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Workplan
Completed Date: 03/03/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 04/22/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 01/28/2000
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

ORTEGA HIGH SCHOOL/ALTERNATIVE EDUCATION (Continued) **S107736971**

Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	11/17/1999
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

17
SE
1/2-1
0.614 mi.
3243 ft.

ELSINORE GAS CO GAS PLANT **EDR MGP** **1008407692**
RILEY AND FLINT STREETS **N/A**
LAKE ELSINORE, CA 92530

Relative:
Lower

Actual:
1269 ft.

Manufactured Gas Plants:
No additional information available

18
SE
1/2-1
0.711 mi.
3753 ft.

SO CAL GAS/ELSINORE MGP **ENVIROSTOR** **S100714908**
CNR RILEY, FLINT, SPRING & POTTERY **VCP** **N/A**
ELSINORE, CA 92530

Relative:
Lower

Actual:
1273 ft.

ENVIROSTOR:

Facility ID:	33490082
Status:	Certified
Status Date:	06/30/2003
Site Code:	400337
Site Type:	Voluntary Cleanup
Site Type Detailed:	Voluntary Cleanup
Acres:	2.8
NPL:	NO
Regulatory Agencies:	DTSC
Lead Agency:	DTSC
Program Manager:	Not reported
Supervisor:	* Greg Holmes
Division Branch:	Cleanup Cypress
Assembly:	67
Senate:	28
Special Program:	Voluntary Cleanup Program
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	33.67444
Longitude:	-117.3262
APN:	NONE SPECIFIED
Past Use:	MANUFACTURED GAS PLANT
Potential COC:	Polynuclear aromatic hydrocarbons (PAHs

SO CAL GAS/ELSINORE MGP (Continued) **S100714908**

Confirmed COC: Polynuclear aromatic hydrocarbons (PAHs
Potential Description: SOIL
Alias Name: SO. CALIFORNIA GAS - ELSINORE
Alias Type: Alternate Name
Alias Name: SOUTHERN CALIFORNIA GAS
Alias Type: Alternate Name
Alias Name: SOUTHERN CALIFORNIA GAS COMPANY
Alias Type: Alternate Name
Alias Name: TOWN GAS SITE - ELSINORE
Alias Type: Alternate Name
Alias Name: 110033605695
Alias Type: EPA (FRS #)
Alias Name: 400337
Alias Type: Project Code (Site Code)
Alias Name: 33490082
Alias Type: Envirostor ID Number

Completed Info:

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Certification
Completed Date: 06/30/2003
Comments: The Department has determined that all appropriate removal/ remedial actions have been completed and that all acceptable engineering practices were implemented and the site requires no operation and maintenance (O&M) and monitoring efforts.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 08/20/1993
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Completion Report
Completed Date: 06/23/2003
Comments: Approximately 2.8 acres in Elsinore was used as a Manufactured Gas Plant (MGP) in 1920 through 1929. From 1923 to 1953 this facility was used as a storage for Natural Gas. MGP operation at the site contaminated the soil with Polynuclear Aromatic Hydrocarbons (PAHs). A total of 3.394 tons of PAH contaminated soil above 0.9 benzo(A)pyrene was excavated and removed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Removal Action Workplan
Completed Date: 10/21/2002
Comments: Removal Action Workplan for soil completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 06/02/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

SO CAL GAS/ELSINORE MGP (Continued) **S100714908**

Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 04/30/2001
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

VCP:
Facility ID: 33490082
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 2.8
National Priorities List: NO
Cleanup Oversight Agencies: DTSC
Lead Agency: DTSC
Lead Agency Description: * DTSC
Project Manager: Not reported
Supervisor: * Greg Holmes
Division Branch: Cleanup Cypress
Site Code: 400337
Assembly: 67
Senate: 28
Special Programs Code: Voluntary Cleanup Program
Status: Certified
Status Date: 06/30/2003
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 33.67444 / -117.3262
APN: NONE SPECIFIED
Past Use: MANUFACTURED GAS PLANT
Potential COC: 30019
Confirmed COC: 30019
Potential Description: SOIL
Alias Name: SO. CALIFORNIA GAS - ELSINORE
Alias Type: Alternate Name
Alias Name: SOUTHERN CALIFORNIA GAS
Alias Type: Alternate Name
Alias Name: SOUTHERN CALIFORNIA GAS COMPANY
Alias Type: Alternate Name
Alias Name: TOWN GAS SITE - ELSINORE
Alias Type: Alternate Name
Alias Name: 110033605695
Alias Type: EPA (FRS #)
Alias Name: 400337
Alias Type: Project Code (Site Code)
Alias Name: 33490082
Alias Type: Envirostor ID Number

Completed Info:

SO CAL GAS/ELSINORE MGP (Continued) **S100714908**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Certification
Completed Date:	06/30/2003
Comments:	The Department has determined that all appropriate removal/ remedial actions have been completed and that all acceptable engineering practices were implemented and the site requires no operation and maintenance (O&M) and monitoring efforts.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	08/20/1993
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Completion Report
Completed Date:	06/23/2003
Comments:	Approximately 2.8 acres in Elsinore was used as a Manufactured Gas Plant (MGP) in 1920 through 1929. From 1923 to 1953 this facility was used as a storage for Natural Gas. MGP operation at the site contaminated the soil with Polynuclear Aromatic Hydrocarbons (PAHs). A total of 3.394 tons of PAH contaminated soil above 0.9 benzo(A)pyrene was excavated and removed.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Removal Action Workplan
Completed Date:	10/21/2002
Comments:	Removal Action Workplan for soil completed.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	06/02/1994
Comments:	Not reported

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	04/30/2001
Comments:	Not reported

Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
ELSINORE	1010558061	SO CAL GAS/ELSINORE MGP	CNR OF RILEY,FLINT,SPRING, POT	92530	EDR MGP

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 66

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 66

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/22/2017
Date Data Arrived at EDR: 06/13/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 94

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/09/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 63

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/12/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 48

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/12/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/12/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/16/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/14/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/24/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/06/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/13/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 15
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 134
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/12/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/24/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/14/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80
Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/16/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 01/13/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 80

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/22/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 36
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 21
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 36
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 39

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/09/2018
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/30/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 02/02/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 16

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2017
Date Data Arrived at EDR: 08/18/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 34

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 16

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 02/28/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 27

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 01/28/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 46

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/08/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 0

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 63

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 02/15/2018
Date Data Arrived at EDR: 02/20/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 42

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 04/24/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/13/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/16/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 01/11/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 42
Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88
Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6
Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198
Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/23/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/09/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/20/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/13/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 04/09/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/09/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/03/2018
Date Data Arrived at EDR: 01/04/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 99
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 79

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/27/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 10/29/2017
Date Data Arrived at EDR: 11/28/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 45

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/20/2017
Date Data Arrived at EDR: 12/21/2017
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 92

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/21/2018
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 28

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/13/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2016
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 73

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/13/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 04/13/2018
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 30
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6
Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/08/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 0
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 12/01/2017
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 42
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Annually

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 147
Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/23/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 54

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/14/2018
Date Data Arrived at EDR: 02/16/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 46

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/12/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 41

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 41
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/08/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 02/06/2018
Number of Days to Update: 28
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 31
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 02/27/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 42
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 02/14/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 29
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 03/05/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 04/19/2018
Number of Days to Update: 45
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 03/05/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 35
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/14/2017
Date Data Arrived at EDR: 12/15/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 32
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 36
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 04/13/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 01/11/2018
Date Made Active in Reports: 02/22/2018
Number of Days to Update: 42

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 63

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 10

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 01/25/2018
Date Data Arrived at EDR: 01/26/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 47

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/26/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 02/26/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 14

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 48

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 01/05/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 40

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 04/25/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 03/05/2018
Date Data Arrived at EDR: 03/08/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 39

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 9

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 08/03/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/26/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 47

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 08/04/2017
Number of Days to Update: 56

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 02/02/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 54

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 28

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 02/06/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 33

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/16/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 56

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/16/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 29

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/17/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 10/09/2017
Number of Days to Update: 171

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/01/2018
Date Data Arrived at EDR: 01/17/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 28

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/17/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/05/2018
Date Made Active in Reports: 01/18/2018
Number of Days to Update: 13

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 02/21/2018
Date Data Arrived at EDR: 02/22/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 40

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 01/05/2018
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 12

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 01/11/2018
Date Data Arrived at EDR: 01/12/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 27

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 15

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 03/27/2018
Date Data Arrived at EDR: 03/29/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 18

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/20/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 30

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 01/31/2018
Date Data Arrived at EDR: 02/01/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 41

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 04/25/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/05/2018
Date Data Arrived at EDR: 02/13/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 49

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/05/2018
Date Data Arrived at EDR: 02/13/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 35

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 02/07/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 49

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/07/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 12/08/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 50

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 03/15/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 50

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/18/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 56

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/19/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/18/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 64

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/19/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 01/03/2018
Date Made Active in Reports: 02/05/2018
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 01/03/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 42

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/17/2017
Number of Days to Update: 14

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/30/2017
Date Data Arrived at EDR: 12/01/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 46

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 03/05/2018
Date Data Arrived at EDR: 03/07/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 40

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/02/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 12/20/2017
Date Data Arrived at EDR: 12/21/2017
Date Made Active in Reports: 02/01/2018
Number of Days to Update: 42
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 12/12/2017
Date Data Arrived at EDR: 12/14/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 28
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/11/2018
Number of Days to Update: 78
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/20/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 27
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 02/04/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 42

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 12/14/2017
Date Data Arrived at EDR: 12/15/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 28

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 03/13/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 16

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 04/16/2018
Number of Days to Update: 20

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 03/22/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 02/06/2018
Number of Days to Update: 28

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/22/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 02/06/2018
Date Data Arrived at EDR: 02/07/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 37

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 04/16/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 01/08/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/30/2018
Number of Days to Update: 29

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List

Cupa facilities

Date of Government Version: 01/26/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 47

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 53

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 03/19/2018
Date Data Arrived at EDR: 03/22/2018
Date Made Active in Reports: 04/17/2018
Number of Days to Update: 26

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 50

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 04/18/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/26/2017
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 48

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/23/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 12/26/2017
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 54

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 04/23/2018
Next Scheduled EDR Contact: 08/06/2018
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 02/28/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/30/2018
Number of Days to Update: 16
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 01/19/2018
Number of Days to Update: 10
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 02/01/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 47
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 04/25/2018
Next Scheduled EDR Contact: 08/13/2018
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 01/03/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/22/2018
Number of Days to Update: 36
Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107
Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/23/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/09/2018
Number of Days to Update: 37

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/12/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/08/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data

Source: PennWell Corporation

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.
Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.
Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

3522
WEST MINTHORN STREET
LAKE ELSINORE, CA 92530

TARGET PROPERTY COORDINATES

Latitude (North):	33.683134 - 33° 40' 59.28''
Longitude (West):	117.33432 - 117° 20' 3.55''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	469011.3
UTM Y (Meters):	3726880.2
Elevation:	1277 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5636473 LAKE ELSINORE, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

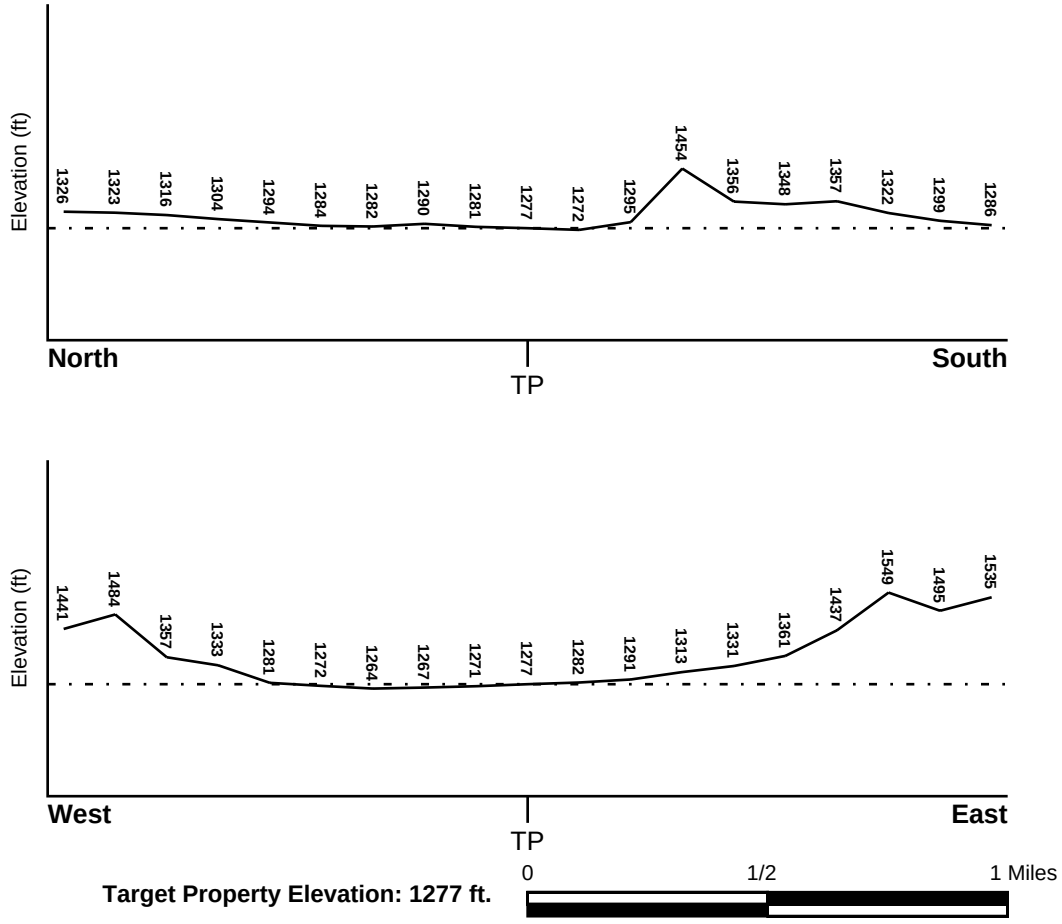
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1277 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06065C2037G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06065C2028G	FEMA FIRM Flood data
06065C2029G	FEMA FIRM Flood data
06065C2036G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
A1	1/2 - 1 Mile SE	Not Reported
A2	1/2 - 1 Mile SE	WSW
3	1/2 - 1 Mile SE	Not Reported
B4	1/2 - 1 Mile SSW	S
B5	1/2 - 1 Mile SSW	S
6	1/2 - 1 Mile South	SE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
1G	1/2 - 1 Mile SE	Not Reported
2G	1/2 - 1 Mile SE	WSW
3G	1/2 - 1 Mile SE	Not Reported
4G	1/2 - 1 Mile SSW	S
5G	1/2 - 1 Mile SSW	S
6G	1/2 - 1 Mile South	SE

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

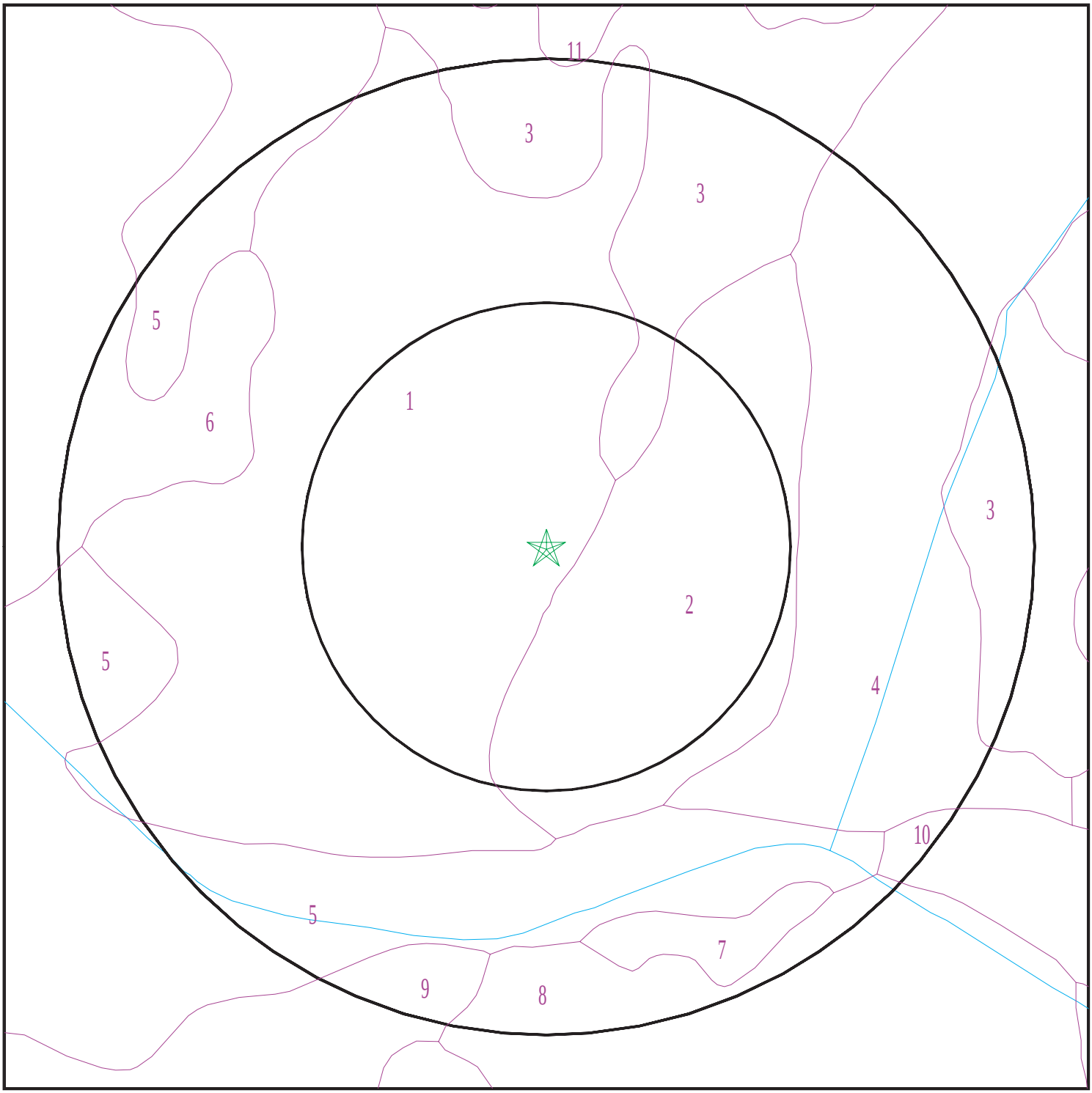
Era:	Mesozoic
System:	Lower Jurassic and Upper Triassic
Series:	Lower Mesozoic
Code:	lMze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5276026.2s



SITE NAME:	3522	CLIENT:	California Environmental
ADDRESS:	West Minthorn Street Lake Elsinore CA 92530	CONTACT:	Ryan Bzoskie
LAT/LONG:	33.683134 / 117.33432	INQUIRY #:	5276026.2s
		DATE:	April 30, 2018 2:48 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: GARRETSON

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	59 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: GARRETSON

Soil Surface Texture: gravelly very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	gravelly very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	53 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 7.8 Min: 6.1
3	53 inches	72 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 3

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

Soil Map ID: 4

Soil Component Name: CORTINA

Soil Surface Texture: gravelly sandy loam

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 42 Min: 14	Max: 8.4 Min: 5.6
2	22 inches	38 inches	stratified very gravelly loamy sand to very gravelly loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 42 Min: 14	Max: 8.4 Min: 5.6
3	38 inches	59 inches	stratified very gravelly sand to very gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141 Min: 42	Max: 8.4 Min: 5.6

Soil Map ID: 5

Soil Component Name: GARRETSON

Soil Surface Texture: gravelly very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	gravelly very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 14 Min: 4	Max: 7.3 Min: 6.1
2	9 inches	53 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 7.8 Min: 6.1
3	53 inches	72 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 6

Soil Component Name: PACHAPPA

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
2	20 inches	62 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.6

Soil Map ID: 7

Soil Component Name: GARRETSON

Soil Surface Texture: gravelly very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	gravelly very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 6.1

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	50 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 7.8 Min: 6.1
3	50 inches	72 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.8 Min: 6.1

Soil Map ID: 8

Soil Component Name: LODO

Soil Surface Texture: gravelly loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 38 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 5.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	7 inches	18 inches	unweathered bedrock	Not reported	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Map ID: 9

Soil Component Name: HONCUT

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.3 Min: 5.6
2	22 inches	59 inches	coarse sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 6.1

Soil Map ID: 10

Soil Component Name: WAUKENA

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 9.6 Min: 7.8
2	11 inches	59 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.4 Min: 0.42	Max: 9.6 Min: 7.8

Soil Map ID: 11

Soil Component Name: ARBUCKLE

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	25 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	25 inches	44 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6
3	44 inches	68 inches	stratified very gravelly sandy loam to very gravelly sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 4 Min: 1.4	Max: 7.8 Min: 5.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

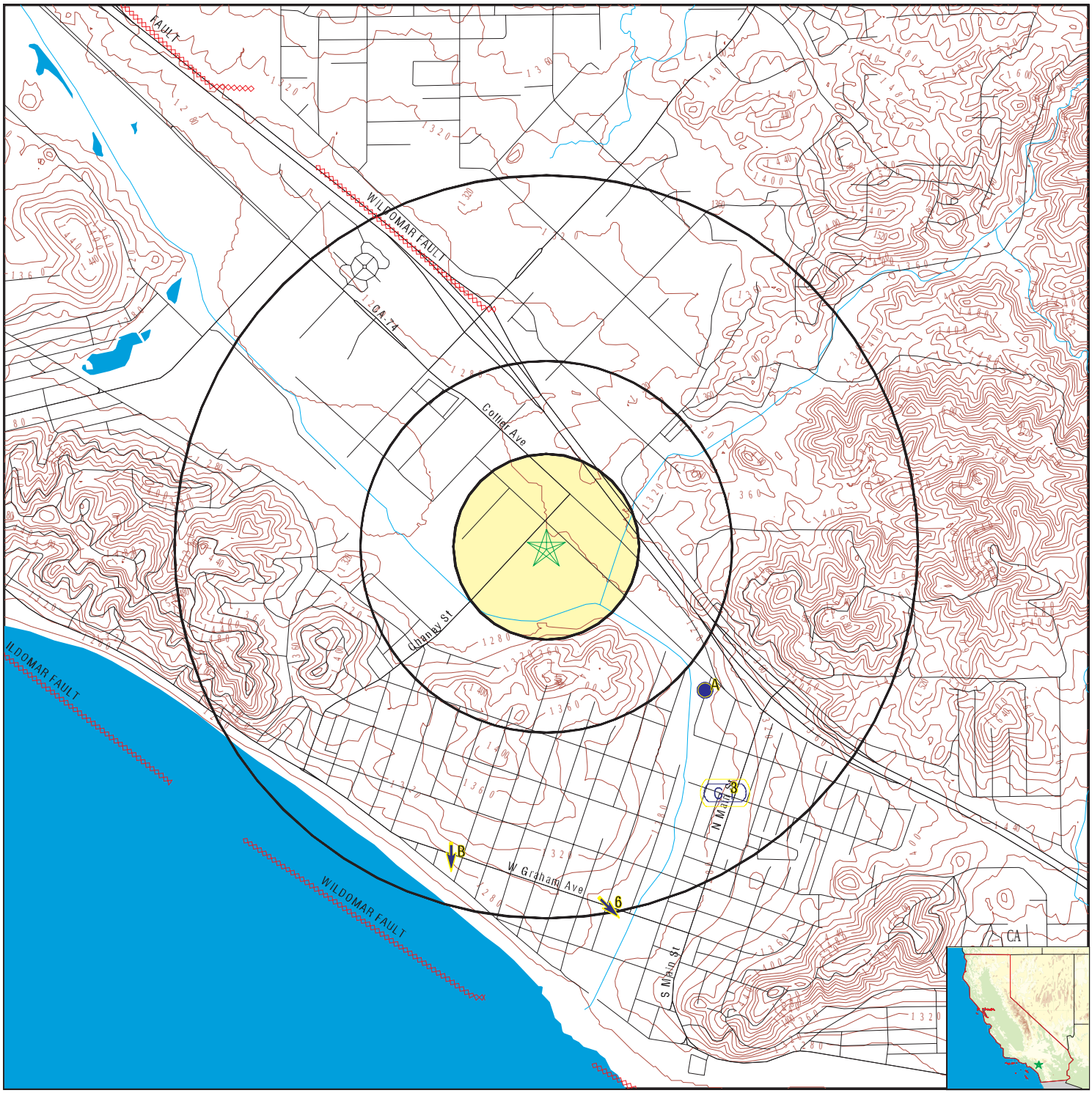
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 5276026.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	3522	CLIENT:	California Environmental
ADDRESS:	West Minthorn Street Lake Elsinore CA 92530	CONTACT:	Ryan Bzoskie
		INQUIRY #:	5276026.2s
LAT/LONG:	33.683134 / 117.33432	DATE:	April 30, 2018 2:48 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
A1 **SE** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083300978T Not Reported Not Reported Not Reported 18 ft 05/26/1988	**AQUIFLOW**	**50994**
A2 **SE** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083301248T WSW Not Reported Not Reported 15 11/1995	**AQUIFLOW**	**50780**
3 **SE** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302367T Not Reported 30’ 32’ Not Reported 09/28/1993	**AQUIFLOW**	**66359**
B4 **SSW** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302293T S Not Reported Not Reported 16 03/28/1995	**AQUIFLOW**	**37869**
B5 **SSW** **1/2 - 1 Mile** **Higher**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302293T S Not Reported Not Reported 16 03/28/1995	**AQUIFLOW**	**37868**
6 **South** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083300506T SE 16.37 26.64 Not Reported 11/23/1998	**AQUIFLOW**	**50996**
1G **SE** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083300978T Not Reported Not Reported Not Reported 18 ft 05/26/1988	**AQUIFLOW**	**50994**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
2G **SE** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083301248T WSW Not Reported Not Reported 15 11/1995	**AQUIFLOW**	**50780**
3G **SE** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302367T Not Reported 30’ 32’ Not Reported 09/28/1993	**AQUIFLOW**	**66359**
4G **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302293T S Not Reported Not Reported 16 03/28/1995	**AQUIFLOW**	**37869**
5G **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083302293T S Not Reported Not Reported 16 03/28/1995	**AQUIFLOW**	**37868**
6G **South** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083300506T SE 16.37 26.64 Not Reported 11/23/1998	**AQUIFLOW**	**50996**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92530	6	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

APPENDIX IV

Soil Sample Data Tables I-III

TABLE I

Laboratory Analysis of Soil - TPH

Minthorn Street,

Lake Elsinore, California 92530

Sample ID	Date	EPA Method 8015M (mg/kg) TPH (C6-C44)
CE551@ 6in	5/19/2018	92
CE552@ 6in	5/19/2018	40
CE553@ 6in	5/19/2018	<10

TPH - Total Petroleum Hydrocarbons

TABLE II

Laboratory Analysis of Soil - Metals

Minthorn Street

Lake Elsinore, California 92530

Sample I.D.	Date	CAM Metals - EPA 6010B/7000 (mg/kg)																
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CE551@ 6in	5/19/2018	<10	7.9	13	140	<1.0	21	7.2	11	16	<0.020	<5.0	12	<0.5	<1.0	<5.0	55	45
CE552@ 6in	5/19/2018	<10	10	350	170	<1.0	68	9.1	26	250	<0.020	<5.0	55	<0.5	<1.0	<5.0	46	110
CE553@ 6in	5/19/2018	<10	9	340	110	<1.0	22	7.4	10	14	<0.020	<5.0	13	<0.5	<1.0	<5.0	56	55
Clay Pot Fragments	5/2/2018	<10	1.6	41	<1.0	<1.0	7.2	7	17	3.2	<0.020	<5.0	<3.0	<0.50	<1.0	<5.0	<10	4
CHHSLs Commercial		380	0.24*	63,000	190	7.5	100,000	3,200	38,000	320	180	4800	16,000	4,800	4,800	63	6700	100,000
CHHSLs residential		30	0.07	5,200	16	1.7	100,000	660	3,000	80	18	380	1,600	380	380	5	530	23,000

* - Arsenic concentration compared to background levels - in SoCal 3-15 mg/kg

TABLE III

Laboratory Analysis of Soil - Pesticides

Minthorn Street,

Lake Elsinore, California 92530

Sample I.D.	Date	EPA Method 8081A - Pesticides (µg/kg)						
		Alpha-Chlordane	Gamma-Chlordane	Chlordane	4,4-DDE	Dieldrin	4,4-DDT	All other analytes
Composite (1,2,3)	5/21/2018	<20	<20	<100	<20	<10	<20	ND
CHSSLs (residential)		430	430	430	1600	35	1600	
CHSSLs (commercial)		1700	1700	1700	6300	130	6300	

CHHSLs = California Human Health Screening Levels, 2005, updated 2010.

APPENDIX V

Laboratory Test Reports

AMERICAN ANALYTICS

9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

June 15, 2018

Charles Buckley

Cal Environmental

30423 Canwood Street, Suite 208

Agoura Hills, CA 91301

Re : Minthorn / 3522

A243913 / 8E22024

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 05/22/18 12:47 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analytics.

Sincerely,

Allen Aminian

QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
8081A OCPs					
Composite (1,2,3)	8E22024-04	Soil	3	05/21/18 13:40	05/22/18 12:47
8082 PCBs					
Composite (1,2,3)	8E22024-04	Soil	3	05/21/18 13:40	05/22/18 12:47
CAM Metals Less Hg 6000/7000					
CE551@ 6in	8E22024-01	Soil	3	05/19/18 13:15	05/22/18 12:47
CE552@ 6in	8E22024-02	Soil	3	05/19/18 13:25	05/22/18 12:47
CE553@ 6in	8E22024-03	Soil	3	05/19/18 13:39	05/22/18 12:47
Carbon Chain Characterization 8015M					
CE551@ 6in	8E22024-01	Soil	3	05/19/18 13:15	05/22/18 12:47
CE552@ 6in	8E22024-02	Soil	3	05/19/18 13:25	05/22/18 12:47
CE553@ 6in	8E22024-03	Soil	3	05/19/18 13:39	05/22/18 12:47
Mercury Total EPA 7470A/7471A					
CE551@ 6in	8E22024-01	Soil	3	05/19/18 13:15	05/22/18 12:47
CE552@ 6in	8E22024-02	Soil	3	05/19/18 13:25	05/22/18 12:47
CE553@ 6in	8E22024-03	Soil	3	05/19/18 13:39	05/22/18 12:47

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Chain by GC/FID								
C22-C24	CE551@ 6in	**1.3**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C24-C26	CE551@ 6in	**1.1**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C26-C28	CE551@ 6in	**8.0**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C28-C32	CE551@ 6in	**22**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C32-C34	CE551@ 6in	**13**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C34-C36	CE551@ 6in	**11**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C36-C40	CE551@ 6in	**20**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C40-C44	CE551@ 6in	**16**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
TPH (C6-C44)	CE551@ 6in	**92**	10	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C22-C24	CE552@ 6in	**1.7**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C24-C26	CE552@ 6in	**2.5**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C26-C28	CE552@ 6in	**3.9**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C28-C32	CE552@ 6in	**10**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C32-C34	CE552@ 6in	**6.8**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C34-C36	CE552@ 6in	**3.6**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C36-C40	CE552@ 6in	**6.3**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C40-C44	CE552@ 6in	**4.9**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
TPH (C6-C44)	CE552@ 6in	**40**	10	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C28-C32	CE553@ 6in	**2.8**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C32-C34	CE553@ 6in	**2.4**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C34-C36	CE553@ 6in	**1.4**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C36-C40	CE553@ 6in	**1.6**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M
C40-C44	CE553@ 6in	**1.3**	1.0	mg/kg	1	05/24/18	05/24/18	EPA 8015M

Organochlorine Pesticides by GC EPA 8081A

Polychlorinated Biphenyls by GC

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Total Metals CAM 17								
Total Metals CAM 17								
Arsenic	CE551@ 6in	**7.9**	0.50	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Barium	CE551@ 6in	**140**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Chromium	CE551@ 6in	**21**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Cobalt	CE551@ 6in	**7.2**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Copper	CE551@ 6in	**11**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Lead	CE551@ 6in	**16**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Nickel	CE551@ 6in	**12**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Vanadium	CE551@ 6in	**55**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Zinc	CE551@ 6in	**45**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Arsenic	CE552@ 6in	**10**	0.50	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Barium	CE552@ 6in	**170**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Chromium	CE552@ 6in	**68**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Cobalt	CE552@ 6in	**9.1**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Copper	CE552@ 6in	**26**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Lead	CE552@ 6in	**250**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Nickel	CE552@ 6in	**55**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Vanadium	CE552@ 6in	**46**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Zinc	CE552@ 6in	**110**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Arsenic	CE553@ 6in	**9.0**	0.50	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Barium	CE553@ 6in	**110**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Chromium	CE553@ 6in	**22**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Cobalt	CE553@ 6in	**7.4**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Copper	CE553@ 6in	**10**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Lead	CE553@ 6in	**14**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Nickel	CE553@ 6in	**13**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Vanadium	CE553@ 6in	**56**	10	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000
Zinc	CE553@ 6in	**55**	3.0	mg/kg	1	05/24/18	05/24/18	EPA 6010B/7000

Allen Aminian
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LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	A243913
Project No:	3522	**Date Received:**	05/22/18
Project Name:	Minthorn	**Date Reported:**	06/15/18
Method:	Polychlorinated Biphenyls by GC	**Units:**	ug/kg

Date Sampled:	05/21/18	
Date Prepared:	05/23/18	
Date Analyzed:	05/24/18	
AA ID No:	8E22024-04	
Client ID No:	Composite (1,2,3)	
Matrix:	Soil	
Dilution Factor:	1	MRL

8082 PCBs (EPA 8082)

Aroclor-1016	<20	20
Aroclor-1221	<20	20
Aroclor-1232	<20	20
Aroclor-1242	<20	20
Aroclor-1248	<20	20
Aroclor-1254	<20	20
Aroclor-1260	<20	20

Surrogates		**%REC Limits**
Decachlorobiphenyl	92%	50-150
Tetrachloro-meta-xylene	90%	50-150

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LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	A243913
Project No:	3522	**Date Received:**	05/22/18
Project Name:	Minthorn	**Date Reported:**	06/15/18
Method:	Organochlorine Pesticides by GC EPA 8081A	**Units:**	ug/kg

Date Sampled:	05/21/18	
Date Prepared:	05/23/18	
Date Analyzed:	05/24/18	
AA ID No:	8E22024-04	
Client ID No:	Composite (1,2,3)	
Matrix:	Soil	
Dilution Factor:	5	MRL

8081A OCPs (EPA 8081A)

4,4´-DDD	<20 [1]	4.0
4,4´-DDE	<20 [1]	4.0
4,4´-DDT	<20 [1]	4.0
Aldrin	<10 [1]	2.0
beta-BHC	<10 [1]	2.0
delta-BHC	<10 [1]	2.0
alpha-BHC	<10 [1]	2.0
gamma-BHC (Lindane)	<20 [1]	4.0
gamma-Chlordane	<20 [1]	4.0
alpha-Chlordane	<20 [1]	4.0
Chlordane	<100 [1]	20
Dieldrin	<10 [1]	2.0
Endosulfan I	<10 [1]	2.0
Endosulfan II	<20 [1]	4.0
Endosulfan sulfate	<20 [1]	4.0
Endrin	<20 [1]	4.0
Endrin aldehyde	<20 [1]	4.0
Endrin ketone	<20 [1]	4.0
Heptachlor	<10 [1]	2.0
Heptachlor epoxide	<10 [1]	2.0
Methoxychlor	<100 [1]	20
Toxaphene	<500 [1]	100

Surrogates		**%REC Limits**
Decachlorobiphenyl	80% [1]	50-150
Tetrachloro-meta-xylene	81% [1]	50-150

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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn
Method: Carbon Chain by GC/FID

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18
Units: mg/kg

Date Sampled:	05/19/18	05/19/18	05/19/18	
Date Prepared:	05/24/18	05/24/18	05/24/18	
Date Analyzed:	05/24/18	05/24/18	05/24/18	
AA ID No:	8E22024-01	8E22024-02	8E22024-03	
Client ID No:	CE551@ 6in	CE552@ 6in	CE553@ 6in	
Matrix:	Soil	Soil	Soil	
Dilution Factor:	1	1	1	MRL
Carbon Chain Characterization 8015M (EPA 8015M)				
C6-C8	<1.0	<1.0	<1.0	1.0
C8-C10	<1.0	<1.0	<1.0	1.0
C10-C12	<1.0	<1.0	<1.0	1.0
C12-C14	<1.0	<1.0	<1.0	1.0
C14-C16	<1.0	<1.0	<1.0	1.0
C16-C18	<1.0	<1.0	<1.0	1.0
C18-C20	<1.0	<1.0	<1.0	1.0
C20-C22	<1.0	<1.0	<1.0	1.0
C22-C24	**1.3**	**1.7**	<1.0	1.0
C24-C26	**1.1**	**2.5**	<1.0	1.0
C26-C28	**8.0**	**3.9**	<1.0	1.0
C28-C32	**22**	**10**	**2.8**	1.0
C32-C34	**13**	**6.8**	**2.4**	1.0
C34-C36	**11**	**3.6**	**1.4**	1.0
C36-C40	**20**	**6.3**	**1.6**	1.0
C40-C44	**16**	**4.9**	**1.3**	1.0
TPH (C6-C44)	**92**	**40**	<10	10
Surrogates				**%REC Limits**
o-Terphenyl	93%	99%	94%	50-150

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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn
Method: Total Metals CAM 17

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18
Units: mg/kg

Date Sampled:	05/19/18	05/19/18	05/19/18	
Date Prepared:	05/24/18	05/24/18	05/24/18	
Date Analyzed:	05/24/18	05/24/18	05/24/18	
AA ID No:	8E22024-01	8E22024-02	8E22024-03	
Client ID No:	CE551@ 6in	CE552@ 6in	CE553@ 6in	
Matrix:	Soil	Soil	Soil	
Dilution Factor:	1	1	1	MRL
CAM Metals Less Hg 6000/7000 (EPA 6010B/7000)				
Antimony	<10	<10	<10	10
Arsenic	**7.9**	**10**	**9.0**	0.50
Barium	**140**	**170**	**110**	10
Beryllium	<1.0	<1.0	<1.0	1.0
Cadmium	<1.0	<1.0	<1.0	1.0
Chromium	**21**	**68**	**22**	3.0
Cobalt	**7.2**	**9.1**	**7.4**	3.0
Copper	**11**	**26**	**10**	3.0
Lead	**16**	**250**	**14**	3.0
Molybdenum	<5.0	<5.0	<5.0	5.0
Nickel	**12**	**55**	**13**	3.0
Selenium	<0.50	<0.50	<0.50	0.50
Silver	<1.0	<1.0	<1.0	1.0
Thallium	<5.0	<5.0	<5.0	5.0
Vanadium	**55**	**46**	**56**	10
Zinc	**45**	**110**	**55**	3.0

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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn
Method: Total Metals CAM 17

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18
Units: mg/kg

Date Sampled:	05/19/18	05/19/18	05/19/18	
Date Prepared:	05/23/18	05/23/18	05/23/18	
Date Analyzed:	05/23/18	05/23/18	05/23/18	
AA ID No:	8E22024-01	8E22024-02	8E22024-03	
Client ID No:	CE551@ 6in	CE552@ 6in	CE553@ 6in	
Matrix:	Soil	Soil	Soil	
Dilution Factor:	1	1	1	MRL
Mercury Total EPA 7470A/7471A (EPA 7471A)				
Mercury	<0.020	<0.020	<0.020	0.020

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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Polychlorinated Biphenyls by GC - Quality Control										
Batch B8E2317 - EPA 3550B										
Blank (B8E2317-BLK1)				Prepared & Analyzed: 05/23/18						
Aroclor-1016	<20	20	ug/kg							
Aroclor-1221	<20	20	ug/kg							
Aroclor-1232	<20	20	ug/kg							
Aroclor-1242	<20	20	ug/kg							
Aroclor-1248	<20	20	ug/kg							
Aroclor-1254	<20	20	ug/kg							
Aroclor-1260	<20	20	ug/kg							
Surrogate: Decachlorobiphenyl	*5.42*		*ug/kg*	*5.0*		*108*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.63*		*ug/kg*	*5.0*		*52.7*	*50-150*			
LCS (B8E2317-BS1)				Prepared & Analyzed: 05/23/18						
Surrogate: Decachlorobiphenyl	*4.23*		*ug/kg*	*5.0*		*84.6*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.90*		*ug/kg*	*5.0*		*57.9*	*50-150*			
LCS (B8E2317-BS2)				Prepared & Analyzed: 05/23/18						
Aroclor-1016	**60.6**	20	ug/kg	50		121	60-140			
Aroclor-1260	**61.8**	20	ug/kg	50		124	60-140			
Surrogate: Decachlorobiphenyl	*5.65*		*ug/kg*	*5.0*		*113*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*4.46*		*ug/kg*	*5.0*		*89.1*	*50-150*			
LCS Dup (B8E2317-BSD1)				Prepared & Analyzed: 05/23/18						
Surrogate: Decachlorobiphenyl	*4.04*		*ug/kg*	*5.0*		*80.8*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.71*		*ug/kg*	*5.0*		*54.1*	*50-150*			
LCS Dup (B8E2317-BSD2)				Prepared & Analyzed: 05/23/18						
Aroclor-1016	**60.4**	20	ug/kg	50		121	60-140	0.363	40	
Aroclor-1260	**60.8**	20	ug/kg	50		122	60-140	1.60	40	
Surrogate: Decachlorobiphenyl	*5.72*		*ug/kg*	*5.0*		*114*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*4.40*		*ug/kg*	*5.0*		*88.0*	*50-150*			
Organochlorine Pesticides by GC EPA 8081A - Quality Control										
Batch B8E2317 - EPA 3550B										
Blank (B8E2317-BLK1)				Prepared & Analyzed: 05/23/18						
4,4´-DDD	<4.0	4.0	ug/kg							

Allen Aminian
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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Organochlorine Pesticides by GC EPA 8081A - Quality Control										
Batch B8E2317 - EPA 3550B										
Blank (B8E2317-BLK1) Continued				Prepared & Analyzed: 05/23/18						
4,4´-DDE	<4.0	4.0	ug/kg							
4,4´-DDT	<4.0	4.0	ug/kg							
Aldrin	<2.0	2.0	ug/kg							
beta-BHC	<2.0	2.0	ug/kg							
delta-BHC	<2.0	2.0	ug/kg							
alpha-BHC	<2.0	2.0	ug/kg							
gamma-BHC (Lindane)	<4.0	4.0	ug/kg							
gamma-Chlordane	<4.0	4.0	ug/kg							
alpha-Chlordane	<4.0	4.0	ug/kg							
Chlordane	<20	20	ug/kg							
Dieldrin	<2.0	2.0	ug/kg							
Endosulfan I	<2.0	2.0	ug/kg							
Endosulfan II	<4.0	4.0	ug/kg							
Endosulfan sulfate	<4.0	4.0	ug/kg							
Endrin	<4.0	4.0	ug/kg							
Endrin aldehyde	<4.0	4.0	ug/kg							
Endrin ketone	<4.0	4.0	ug/kg							
Heptachlor	<2.0	2.0	ug/kg							
Heptachlor epoxide	<2.0	2.0	ug/kg							
Methoxychlor	<20	20	ug/kg							
Toxaphene	<100	100	ug/kg							
Surrogate: Decachlorobiphenyl	*5.42*		*ug/kg*	*5.0*		*108*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.63*		*ug/kg*	*5.0*		*52.7*	*50-150*			
LCS (B8E2317-BS1)				Prepared & Analyzed: 05/23/18						
4,4´-DDD	**4.68**	4.0	ug/kg	5.0		93.6	60-140			
4,4´-DDE	**4.73**	4.0	ug/kg	5.0		94.6	60-140			
4,4´-DDT	**4.68**	4.0	ug/kg	5.0		93.6	60-140			
Aldrin	**3.73**	2.0	ug/kg	5.0		74.5	60-140			
beta-BHC	**4.07**	2.0	ug/kg	5.0		81.3	60-140			
delta-BHC	**4.48**	2.0	ug/kg	5.0		89.6	60-140			
alpha-BHC	**4.07**	2.0	ug/kg	5.0		81.5	60-140			

Allen Aminian
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LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Organochlorine Pesticides by GC EPA 8081A - Quality Control										
Batch B8E2317 - EPA 3550B										
LCS (B8E2317-BS1) Continued				Prepared & Analyzed: 05/23/18						
gamma-BHC (Lindane)	**4.14**	4.0	ug/kg	5.0		82.9	60-140			
gamma-Chlordane	**4.45**	4.0	ug/kg	5.0		89.0	60-140			
alpha-Chlordane	**4.54**	4.0	ug/kg	5.0		90.8	60-140			
Dieldrin	**4.09**	2.0	ug/kg	5.0		81.8	60-140			
Endosulfan I	**4.26**	2.0	ug/kg	5.0		85.2	60-140			
Endosulfan II	**4.74**	4.0	ug/kg	5.0		94.8	60-140			
Endosulfan sulfate	**5.07**	4.0	ug/kg	5.0		101	60-140			
Endrin	**4.87**	4.0	ug/kg	5.0		97.4	60-140			
Endrin aldehyde	**4.49**	4.0	ug/kg	5.0		89.8	60-140			
Endrin ketone	**4.48**	4.0	ug/kg	5.0		89.6	60-140			
Heptachlor	**4.41**	2.0	ug/kg	5.0		88.2	60-140			
Heptachlor epoxide	**4.16**	2.0	ug/kg	5.0		83.2	60-140			
Methoxychlor	**5.46**	20	ug/kg	5.0		109	60-140			
Surrogate: Decachlorobiphenyl	*4.23*		*ug/kg*	*5.0*		*84.6*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.90*		*ug/kg*	*5.0*		*57.9*	*50-150*			
LCS Dup (B8E2317-BSD1)				Prepared & Analyzed: 05/23/18						
4,4´-DDD	**4.44**	4.0	ug/kg	5.0		88.8	60-140	5.25	40	
4,4´-DDE	**4.74**	4.0	ug/kg	5.0		94.8	60-140	0.199	40	
4,4´-DDT	**4.60**	4.0	ug/kg	5.0		92.0	60-140	1.73	40	
Aldrin	**3.91**	2.0	ug/kg	5.0		78.2	60-140	4.89	40	
beta-BHC	**4.16**	2.0	ug/kg	5.0		83.2	60-140	2.33	40	
delta-BHC	**4.54**	2.0	ug/kg	5.0		90.8	60-140	1.33	40	
alpha-BHC	**4.15**	2.0	ug/kg	5.0		83.0	60-140	1.78	40	
gamma-BHC (Lindane)	**4.29**	4.0	ug/kg	5.0		85.9	60-140	3.58	40	
gamma-Chlordane	**4.54**	4.0	ug/kg	5.0		90.7	60-140	1.89	40	
alpha-Chlordane	**4.60**	4.0	ug/kg	5.0		92.0	60-140	1.27	40	
Dieldrin	**4.10**	2.0	ug/kg	5.0		82.0	60-140	0.200	40	
Endosulfan I	**4.35**	2.0	ug/kg	5.0		86.9	60-140	1.94	40	
Endosulfan II	**4.59**	4.0	ug/kg	5.0		91.8	60-140	3.16	40	
Endosulfan sulfate	**4.81**	4.0	ug/kg	5.0		96.2	60-140	5.19	40	
Endrin	**4.84**	4.0	ug/kg	5.0		96.9	60-140	0.554	40	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Organochlorine Pesticides by GC EPA 8081A - Quality Control										
Batch B8E2317 - EPA 3550B										
LCS Dup (B8E2317-BSD1) Continued				Prepared & Analyzed: 05/23/18						
Endrin aldehyde	**4.24**	4.0	ug/kg	5.0		84.8	60-140	5.68	40	
Endrin ketone	**4.22**	4.0	ug/kg	5.0		84.4	60-140	5.90	40	
Heptachlor	**4.60**	2.0	ug/kg	5.0		92.0	60-140	4.16	40	
Heptachlor epoxide	**4.28**	2.0	ug/kg	5.0		85.7	60-140	2.87	40	
Methoxychlor	**5.20**	20	ug/kg	5.0		104	60-140	4.98	40	
Surrogate: Decachlorobiphenyl	*4.04*		*ug/kg*	*5.0*		*80.8*	*50-150*			
Surrogate: Tetrachloro-meta-xylene	*2.71*		*ug/kg*	*5.0*		*54.1*	*50-150*			
Carbon Chain by GC/FID - Quality Control										
Batch B8E2420 - EPA 3550B										
Blank (B8E2420-BLK1)				Prepared & Analyzed: 05/24/18						
C6-C8	<1.0	1.0	mg/kg							
C8-C10	<1.0	1.0	mg/kg							
C10-C12	<1.0	1.0	mg/kg							
C12-C14	<1.0	1.0	mg/kg							
C14-C16	<1.0	1.0	mg/kg							
C16-C18	<1.0	1.0	mg/kg							
C18-C20	<1.0	1.0	mg/kg							
C20-C22	<1.0	1.0	mg/kg							
C22-C24	<1.0	1.0	mg/kg							
C24-C26	<1.0	1.0	mg/kg							
C26-C28	<1.0	1.0	mg/kg							
C28-C32	<1.0	1.0	mg/kg							
C32-C34	<1.0	1.0	mg/kg							
C34-C36	<1.0	1.0	mg/kg							
C36-C40	<1.0	1.0	mg/kg							
C40-C44	<1.0	1.0	mg/kg							
TPH (C6-C44)	<10	10	mg/kg							
Surrogate: o-Terphenyl	*8.88*		*mg/kg*	*10*		*88.8*	*50-150*			
LCS (B8E2420-BS1)				Prepared & Analyzed: 05/24/18						
Diesel Range Organics as Diesel	**195**	10	mg/kg	200		97.6	75-125			

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon Chain by GC/FID - Quality Control										
Batch B8E2420 - EPA 3550B										
LCS (B8E2420-BS1) Continued				Prepared & Analyzed: 05/24/18						
Surrogate: o-Terphenyl	*12.5*		*mg/kg*	*10*		*125*	*50-150*			
LCS Dup (B8E2420-BSD1)				Prepared & Analyzed: 05/24/18						
Diesel Range Organics as Diesel	**207**	10	mg/kg	200		104	75-125	5.93	40	
Surrogate: o-Terphenyl	*13.1*		*mg/kg*	*10*		*131*	*50-150*			
Matrix Spike (B8E2420-MS1)		**Source: 8E22024-01**		Prepared & Analyzed: 05/24/18						
Diesel Range Organics as Diesel	**244**	10	mg/kg	200	93.8	75.2	70-130			
Surrogate: o-Terphenyl	*12.0*		*mg/kg*	*10*		*120*	*50-150*			
Matrix Spike Dup (B8E2420-MSD1)		**Source: 8E22024-01**		Prepared & Analyzed: 05/24/18						
Diesel Range Organics as Diesel	**299**	10	mg/kg	200	93.8	103	70-130	20.3	40	
Surrogate: o-Terphenyl	*11.9*		*mg/kg*	*10*		*119*	*50-150*			
Total Metals CAM 17 - Quality Control										
Batch B8E2405 - EPA 3050B										
Blank (B8E2405-BLK1)				Prepared & Analyzed: 05/24/18						
Antimony	<10	10	mg/kg							
Arsenic	<0.50	0.50	mg/kg							
Barium	<10	10	mg/kg							
Beryllium	<1.0	1.0	mg/kg							
Cadmium	<1.0	1.0	mg/kg							
Chromium	<3.0	3.0	mg/kg							
Cobalt	<3.0	3.0	mg/kg							
Copper	<3.0	3.0	mg/kg							
Lead	<3.0	3.0	mg/kg							
Molybdenum	<5.0	5.0	mg/kg							
Nickel	<3.0	3.0	mg/kg							
Selenium	<0.50	0.50	mg/kg							
Silver	<1.0	1.0	mg/kg							
Thallium	<5.0	5.0	mg/kg							
Vanadium	<10	10	mg/kg							
Zinc	<3.0	3.0	mg/kg							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Metals CAM 17 - Quality Control										
Batch B8E2405 - EPA 3050B										
LCS (B8E2405-BS1)				Prepared & Analyzed: 05/24/18						
Antimony	**49.4**	10	mg/kg	50		98.8	80-120			
Arsenic	**48.8**	0.50	mg/kg	50		97.6	80-120			
Barium	**47.4**	10	mg/kg	50		94.7	80-120			
Beryllium	**51.7**	1.0	mg/kg	50		103	80-120			
Cadmium	**52.0**	1.0	mg/kg	50		104	80-120			
Chromium	**49.0**	3.0	mg/kg	50		98.0	80-120			
Cobalt	**50.0**	3.0	mg/kg	50		100	80-120			
Copper	**45.9**	3.0	mg/kg	50		91.9	80-120			
Lead	**46.9**	3.0	mg/kg	50		93.8	80-120			
Molybdenum	**47.8**	5.0	mg/kg	50		95.7	80-120			
Nickel	**50.6**	3.0	mg/kg	50		101	80-120			
Selenium	**49.6**	0.50	mg/kg	50		99.2	80-120			
Silver	**47.0**	1.0	mg/kg	50		94.1	80-120			
Thallium	**49.6**	5.0	mg/kg	50		99.3	80-120			
Vanadium	**49.2**	10	mg/kg	50		98.4	80-120			
Zinc	**53.5**	3.0	mg/kg	50		107	80-120			
LCS Dup (B8E2405-BSD1)				Prepared & Analyzed: 05/24/18						
Antimony	**48.7**	10	mg/kg	50		97.5	80-120	1.30	20	
Arsenic	**48.5**	0.50	mg/kg	50		97.1	80-120	0.534	20	
Barium	**47.0**	10	mg/kg	50		94.0	80-120	0.806	20	
Beryllium	**50.7**	1.0	mg/kg	50		101	80-120	2.03	20	
Cadmium	**50.6**	1.0	mg/kg	50		101	80-120	2.63	20	
Chromium	**48.1**	3.0	mg/kg	50		96.2	80-120	1.87	20	
Cobalt	**49.1**	3.0	mg/kg	50		98.2	80-120	1.88	20	
Copper	**45.6**	3.0	mg/kg	50		91.1	80-120	0.831	20	
Lead	**47.7**	3.0	mg/kg	50		95.5	80-120	1.82	20	
Molybdenum	**51.1**	5.0	mg/kg	50		102	80-120	6.61	20	
Nickel	**49.6**	3.0	mg/kg	50		99.2	80-120	2.07	20	
Selenium	**51.1**	0.50	mg/kg	50		102	80-120	3.00	20	
Silver	**46.5**	1.0	mg/kg	50		93.1	80-120	1.07	20	
Thallium	**49.4**	5.0	mg/kg	50		98.7	80-120	0.586	20	
Vanadium	**48.4**	10	mg/kg	50		96.8	80-120	1.68	20	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Metals CAM 17 - Quality Control										
Batch B8E2405 - EPA 3050B										
LCS Dup (B8E2405-BSD1) Continued				Prepared & Analyzed: 05/24/18						
Zinc	**52.2**	3.0	mg/kg	50		104	80-120	2.44	20	
Matrix Spike (B8E2405-MS1)		**Source: 8E17001-06**		Prepared & Analyzed: 05/24/18						
Antimony	**29.2**	10	mg/kg	50		58.5	75-125			QM-07
Arsenic	**47.7**	0.50	mg/kg	50	1.36	92.6	75-125			
Barium	**90.4**	10	mg/kg	50	41.6	97.5	75-125			
Beryllium	**47.8**	1.0	mg/kg	50		95.7	75-125			
Cadmium	**40.3**	1.0	mg/kg	50		80.7	75-125			
Chromium	**58.4**	3.0	mg/kg	50	10.1	96.5	75-125			
Cobalt	**50.8**	3.0	mg/kg	50	4.55	92.5	75-125			
Copper	**55.5**	3.0	mg/kg	50		111	75-125			
Lead	**51.3**	3.0	mg/kg	50		103	75-125			
Molybdenum	**49.9**	5.0	mg/kg	50		99.8	75-125			
Nickel	**52.6**	3.0	mg/kg	50	8.26	88.7	75-125			
Selenium	**40.5**	0.50	mg/kg	50		81.1	75-125			
Silver	**50.4**	1.0	mg/kg	50		101	75-125			
Thallium	**35.5**	5.0	mg/kg	50		71.0	60-140			
Vanadium	**76.8**	10	mg/kg	50	26.6	100	75-125			
Zinc	**65.6**	3.0	mg/kg	50	19.9	91.4	75-125			
Matrix Spike Dup (B8E2405-MSD1)		**Source: 8E17001-06**		Prepared & Analyzed: 05/24/18						
Antimony	**31.1**	10	mg/kg	50		62.2	75-125	6.07	40	QM-07
Arsenic	**51.6**	0.50	mg/kg	50	1.36	100	75-125	7.86	40	
Barium	**98.4**	10	mg/kg	50	41.6	113	75-125	8.47	40	
Beryllium	**51.7**	1.0	mg/kg	50		103	75-125	7.81	40	
Cadmium	**43.6**	1.0	mg/kg	50		87.3	75-125	7.88	40	
Chromium	**62.5**	3.0	mg/kg	50	10.1	105	75-125	6.84	40	
Cobalt	**55.0**	3.0	mg/kg	50	4.55	101	75-125	7.83	40	
Copper	**59.2**	3.0	mg/kg	50		118	75-125	6.37	40	
Lead	**55.2**	3.0	mg/kg	50		110	75-125	7.43	40	
Molybdenum	**54.1**	5.0	mg/kg	50		108	75-125	8.10	40	
Nickel	**56.5**	3.0	mg/kg	50	8.26	96.4	75-125	7.02	40	
Selenium	**42.5**	0.50	mg/kg	50		85.0	75-125	4.75	40	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: Cal Environmental
Project No: 3522
Project Name: Minthorn

AA Project No: A243913
Date Received: 05/22/18
Date Reported: 06/15/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Total Metals CAM 17 - Quality Control										
Batch B8E2405 - EPA 3050B										
Matrix Spike Dup (B8E2405-MSD1) Continued			**Source: 8E17001-06**	Prepared & Analyzed: 05/24/18						
Silver	**53.5**	1.0	mg/kg	50		107	75-125	6.02	40	
Thallium	**39.6**	5.0	mg/kg	50		79.1	60-140	10.9	40	
Vanadium	**81.8**	10	mg/kg	50	26.6	110	75-125	6.30	40	
Zinc	**70.4**	3.0	mg/kg	50	19.9	101	75-125	7.16	40	
Total Metals CAM 17 - Quality Control										
Batch B8E2329 - EPA 7471A Prep										
Blank (B8E2329-BLK1)				Prepared & Analyzed: 05/23/18						
Mercury	<0.020	0.020	mg/kg							
LCS (B8E2329-BS1)				Prepared & Analyzed: 05/23/18						
Mercury	**0.506**	0.020	mg/kg	0.50		101	80-120			
LCS Dup (B8E2329-BSD1)				Prepared & Analyzed: 05/23/18						
Mercury	**0.508**	0.020	mg/kg	0.50		102	80-120	0.394	25	
Matrix Spike (B8E2329-MS1)			**Source: 8E17001-06**	Prepared & Analyzed: 05/23/18						
Mercury	**0.522**	0.020	mg/kg	0.50		104	75-125			
Matrix Spike Dup (B8E2329-MSD1)			**Source: 8E17001-06**	Prepared & Analyzed: 05/23/18						
Mercury	**0.481**	0.020	mg/kg	0.50		96.2	75-125	8.08	25	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	A243913
Project No:	3522	**Date Received:**	05/22/18
Project Name:	Minthorn	**Date Reported:**	06/15/18

Special Notes

[1] = AA-C1 : Sample was diluted due to matrix interferences resulting in elevated MRLs.

[2] = QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Allen Aminian
QA/QC Manager

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.:

15547

Page ___ of ___

Client: CE		Project Name / No.: Minthorn #3522		Sampler's Name: Brooke	
Project Manager: C. Buckley		Site Address: Minthorn St		Sampler's Signature:	
Phone:		City: Lake Elsinore		P.O. No.:	
Fax:		State & Zip:		Quote No.:	

TAT Turnaround Codes **

① = Same Day Rush ④ = 72 Hour Rush (circled)
② = 24 Hour Rush ⑤ = 5 Day Rush
③ = 48 Hour Rush X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TPH cc	[illegible]	Title 22	5035/8082								Special Instructions
CE552e64	8E22024-01	5/19/18	1:15p	Soil	1	X	X	X									
CE552e64	-02		1:25		1	X	X	X									
CE553e64	-03		1:31		1	X	X	X									
Composite (1,2,3)	-04																
									X								Composite
																	Samples

Please enter the TAT Turnaround Codes ** below

For Laboratory Use	Relinquished by	Date	Time	Received by
	[signature]	5/19/18	630	[signature]
	[signature]	5/22/18	12:47	[signature]
A.A. Project No.: A243913 / 8E22024				

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.

REVIEWED
Date 5/22/18 Time 14:52
TAT 3 Days Sign: [signature]

LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	DRAFT A243916
Project No:	3522	**Date Received:**	06/01/18
Project Name:	Minthorn	**Date Reported:**	06/08/18
Method:	DRAFT: Total Metals CAM 17	**Units:**	mg/kg

Date Sampled:	05/02/18	
Date Prepared:	06/06/18	
Date Analyzed:	06/06/18	
AA ID No:	8F01003-01	
Client ID No:	DRAFT: Grab-Pottery	
Matrix:	Soil	
Dilution Factor:	1	MRL

CAM Metals Less Hg 6000/7000 (EPA 6010B/7000)

Antimony	<10	10
Arsenic	**1.6**	0.50
Barium	**41**	10
Beryllium	<1.0	1.0
Cadmium	<1.0	1.0
Chromium	**7.2**	3.0
Cobalt	**7.0**	3.0
Copper	**17**	3.0
Lead	**3.2**	3.0
Molybdenum	<5.0	5.0
Nickel	<3.0	3.0
Selenium	<0.50	0.50
Silver	<1.0	1.0
Thallium	<5.0	5.0
Vanadium	<10	10
Zinc	**4.0**	3.0

DRAFT REPORT
DATA SUBJECT TO CHANGE

LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	DRAFT A243916
Project No:	3522	**Date Received:**	06/01/18
Project Name:	Minthorn	**Date Reported:**	06/08/18
Method:	DRAFT: Total Metals CAM 17	**Units:**	mg/kg

Date Sampled:	05/02/18	
Date Prepared:	06/06/18	
Date Analyzed:	06/06/18	
AA ID No:	8F01003-01	
Client ID No:	DRAFT: Grab-Pottery	
Matrix:	Soil	
Dilution Factor:	1	MRL

Mercury Total EPA 7470A/7471A (EPA 7471A)

Mercury	<0.020	0.020

DRAFT REPORT
DATA SUBJECT TO CHANGE

LABORATORY ANALYSIS RESULTS

Client:	Cal Environmental	**AA Project No:**	DRAFT A243916
Project No:	3522	**Date Received:**	06/01/18
Project Name:	Minthorn	**Date Reported:**	06/08/18

Special Notes

DRAFT REPORT
DATA SUBJECT TO CHANGE

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

LID BMPs are infeasible because:

a) Infiltration BMPS (infiltration basins, infiltration trenches, drywells) are infeasible due to high seasonal groundwater elevations noted in the geotechnical report. The permit requires a 10-foot deep minimum soil column before treated stormwater reaches groundwater. Untreated stormwater should not be introduced into native onsite soils due to high groundwater potential on this site.

From a water quality perspective and given the proposed site design, bioretention/biotreatment BMPs would best be located parallel to the building walls to maximize treatment flow. However, bioretention and/or biotreatment BMPs with/or without an underdrain, with or without liners, are not recommended for the following reasons:

b) The locations most beneficial for these BMPs will be over-excavated 18 to 20 feet involving removal and replacement of site soils with multiple compacted lifts per the geotechnical report. The use of bioretention in such conditions is infeasible due to the inability of such soils to infiltrate water.

c) Per page 6 of the soils report (found in Appendix 3), "The site soils have significant clay content with MEDIUM expansion potential and therefore stormwater should not purposely or accidentally be introduced into subgrade soils proximate to building foundations or other surface improvements." The medium expansion potential makes infeasible the use of typical near-surface infiltration BMPs (pervious pavement, etc.) as well as typical bioretention/biotreatment BMPs.

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

SB&O INC.
PLANNING ENGINEERING SURVEYING

Pennington Industrial — Job No: 74422
Site Design Vbmp & Qbmp and Water Quality HCOCV calculations — By: BCK
[for City Detention (10-yr 6- & 24-hr events) Volume calculations, see Drainage Report] — Date: 5/16/2019
Sheet: 1 of 1

Precipitation depth for 85th-Percentile 24-hr event per 85th Percentile Precipitation Map, Appendix 1.
HCOC 2-yr 24-hr mitigation (post - pre) volume analysis required. NRCS *TR-55* method is utilized below (*TR-55* approved per *SAR WQMP* (guidance), p. 68, 2012).
City also requires greater of 10-yr 6- or 24-hr event mitigation (post - pre) volume analysis. Same method used for Detention calculatoins; please see Drainage Report for detention calculations.
Precipitation depths from 2-yr 24-hr event per NOAA Precipitation Data Server at project site location, Appendix 7.
Existing site imperviousness is 0.00%. Existing site cover is Barren/graded per RCFC Hydro Mnl Plate D-5.5, and Falow/Bare per NRCS TR-55 Table 2-2c, Appendix 7.
Proposed site cover is Commercial per *RCFC Hydrology Manual* Plate D-5.6 and Commercial per *NRCS TR-55* Table 2-2a. See also Note 3 below.

Table of Site Design Vbmp & Qbmp, Water Quality HCOCV (2x24), and City Detention (10x6/10x24) Calcs to Determine Minimum Detention Volume for Proposed Site

Storm Event Precipitation Depths and Site Area Data with Vbmp and Qbmp Calculations												Water Quality HCOC Volume Calculations per NRCS *TR-55,* 1986						
Storm Event	Precip Depth (in)	(A) Area (sf)	Area (ac)	Perv-ious Area (sf)	Imperv-ious Area (sf)	Pervious Percent (%)	Imperv Percent (%)	Effective Imperv Fraction of Pervious Area per SAR WQMP, Table 2-1, p.22	(B) Design Vbmp per SAR WQMP, p.23 (cf)	(C) Qbmp per SAR WQMP p.23 (cfs)	(D) Design Qbmp per SAR WQMP Table 3-8, p.65 (cfs)	(E) Whole Site NRCS Hydro-logic Soil Group	(F) Whole Site Ex Cond. Runoff Index Curve No.	(G) Whole Site Prop Cond. Runoff Index Curve No.	(H) Whole Site Exist Cond. Storm Event Runoff Volume (cf)	(I) Whole Site Prop Cond. Storm Event Runoff Volume (cf)	(J) WQ Permit Release Limit 105% of Ex Runoff Volume (cf)	(K) Mitigation Volume [2x24 Vol = (I) - (J)] [10yr Vols = (I)-(H)] (cf)
Onsite 85th% 24-hr	0.69	190,025	4.36	23,430	166,595	12.3%	87.7%	0.10	8,693	0.694	0.625							
Offsite 85th% 24-hr	0.69	57,314	1.32	15,460	41,854	27.0%	73.0%	0.10	2,245	0.179	0.161							
Onsite 2-yr 24-hr	2.44	190,025	4.36									B	86	92	18,918	25,933	19,864	6,069
Offsite 2-yr 24-hr	2.44	57,314	1.32									B	86	92	5,706	7,822	5,991	1,831
		247,339	5.68	38,890	208,449	15.7%	84.3%								24,624	33,755	25,855	7,900

Notes on Table above:

1. For Vbmp & Qbmp calculation in columns (B) & (C), see also template-required spreadsheets, Appendix 6. For column (D), see Table E.2 of WQMP (Alt. Compliance, in-fill development).
2. (E) shows Hydrologic Soil Group (HSG) per NRCS Soils Report, Appendix 3.
3. (F) & (G) Runoff Index (Curve) Numbers are the more conservative of the two similar sets: 1) Plates D-5.5 & D-5.6 of *RCFC Hydro Mnl &* 2) Tables 2-2a & 2-2c of *TR-55,* pp. 2-5 & 2-6.
4. (H) & (I) show results for storm event existing and proposed runoff depth, Q, in inches (per Eq. 2-3 of *TR-55,* p. 2-1), multiplied by Site Area (A) to obtain site runoff volume.
5. (J) for the 2x24 event is per HCOC volume release limits described in Section 3.6, Hydromodification, *SAR WQMP* , pp. 68-69, and for the 10x events, per the post- minus pre- volumes.

Hydraulic Discharge Design Conditions

a) Site detention volume is controlled by the 10x24 event. See Drainage Report.
b) Per geotechnical engineering considerations identified in the WQMP, all infiltration and bioretention are infeasible, and no untreated or treated runoff is retained in native onsite soils.
c) Controlled release of site flows will be per the flow rate corresponding to the controlling design storm event, or the design Qbmp.
d) A BioClean modular wetlands device (City-approved) is proposed to receive the design Qbmp flow rate.
e) Storms generating flow rates in excess of the Qbmp will bypass the WQ device and discharge to the street gutter (both onsite and offsite).
f) Note the HCOC is cared for since the onsite volume retained is greater than even the sum of the onsite and offsite HCOC Volumes above.

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	SB&O Inc.	Date	5/15/2019
Designed by	BCK	Case No	
Company Project Number/Name			

BMP Identification

BMP NAME / ID: Onsite

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMAs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
Onsite	*166,595*	*Concrete or Asphalt*	*1*	*0.89*	*148602.7*			
Onsite	*23,430*	*Ornamental Landscaping*	*0.1*	*0.11046*	*2588*			
	190025		***Total***		**151190.7**	**0.20**	***0.7***	***see Table E.2***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	SB&O Inc.	Date	5/15/2019
Designed by	BCK	Case No	
Company Project Number/Name	74422 - Pennington Industrial		

BMP Identification

BMP NAME / ID: Onsite

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.69 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
Onsite	*166,595*	*Concrete or Asphalt*	*1*	*0.89*	*148602.7*			
Onsite	*23,430*	*Ornamental Landscaping*	*0.1*	*0.110458*	*2588*			
	190025		***Total***		**151190.7**	**0.69**	***8693.5***	***n/a***

Notes:

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: SB&O Inc. Date: 4/15/2019
Designed by: BCK Case No:
Company Project Number/Name:

BMP Identification

BMP NAME / ID: Offsite

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
Offsite	*41,854*	*Concrete or Asphalt*	*1*	*0.89*	*37333.8*			
Offsite	*35,337*	*Ornamental Landscaping*	*0.1*	*0.11046*	*3903.3*			
	77191	***Total***			**41237.1**	**0.20**	***0.2***	***see Table E.2***

DMAs

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name SB&O Inc. — Date 4/15/2019
Designed by BCK — Case No
Company Project Number/Name 74422 - Pennington Industrial

BMP Identification

BMP NAME / ID Offsite

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E — D_{85}= 0.69 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
Site	*41,854*	*Concrete or Asphalt*	*1*	*0.89*	*37333.8*			
Site	*15,460*	*Ornamental Landscaping*	*0.1*	*0.110458*	*1707.7*			
	57314	***Total***			**39041.5**	**0.69**	**2244.9**	***n/a***

Notes:

Bio Clean

A Forterra Company

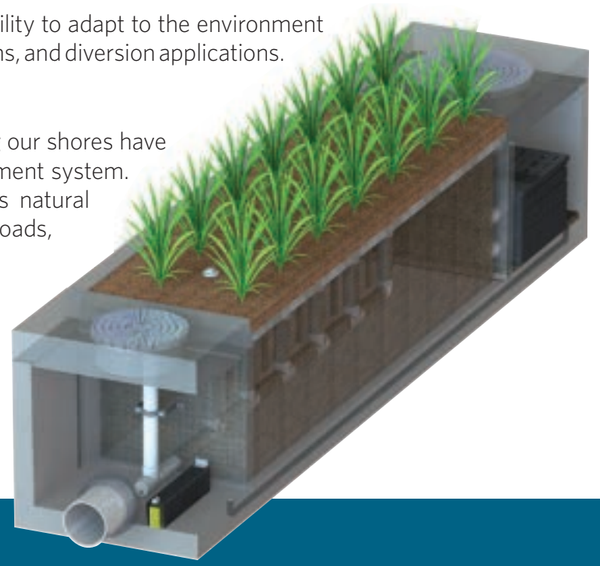
Modular Wetlands® System Linear

A Stormwater Biofiltration Solution

OVERVIEW

The Bio Clean Modular Wetlands® System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint, higher treatment capacity, and a wide range of versatility. While most biofilters use little or no pretreatment, the Modular Wetlands® incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, reducing maintenance costs and improving performance.

Horizontal flow also gives the system the unique ability to adapt to the environment through a variety of configurations, bypass orientations, and diversion applications.



The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as cities grow and develop, our environment's natural filtration systems are blanketed with impervious roads, rooftops, and parking lots.

Bio Clean understands this loss and has spent years re-establishing nature's presence in urban areas, and rejuvenating waterways with the Modular Wetlands® System Linear.

PERFORMANCE

The Modular Wetlands® continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the Modular Wetlands® has been field tested on numerous sites across the country and is proven to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. In fact, the Modular Wetlands® harnesses some of the same biological processes found in natural wetlands in order to collect, transform, and remove even the most harmful pollutants.

66% REMOVAL OF DISSOLVED ZINC	**69%** REMOVAL OF TOTAL ZINC	**38%** REMOVAL OF DISSOLVED COPPER	**64%** REMOVAL OF TOTAL PHOSPHORUS	
45% REMOVAL OF NITROGEN	**50%** REMOVAL OF TOTAL COPPER	**95%** REMOVAL OF MOTOR OIL	**67%** REMOVAL OF ORTHO PHOSPHORUS	**85%** REMOVAL OF TSS

APPROVALS

The Modular Wetlands® System Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world. Here is a list of some of the most high-profile approvals, certifications, and verifications from around the country.

Washington State Department of Ecology TAPE Approved
The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft² loading rate. The highest performing BMP on the market for all main pollutant categories.

California Water Resources Control Board, Full Capture Certification
The Modular Wetlands® System is the first biofiltration system to receive certification as a full capture trash treatment control device.

Virginia Department of Environmental Quality, Assignment
The Virginia Department of Environmental Quality assigned the MWS Linear the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) regulation technical criteria.

Maryland Department of the Environment, Approved ESD
Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.

MASTEP Evaluation
The University of Massachusetts at Amherst – Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.

Rhode Island Department of Environmental Management, Approved BMP
Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

ADVANTAGES

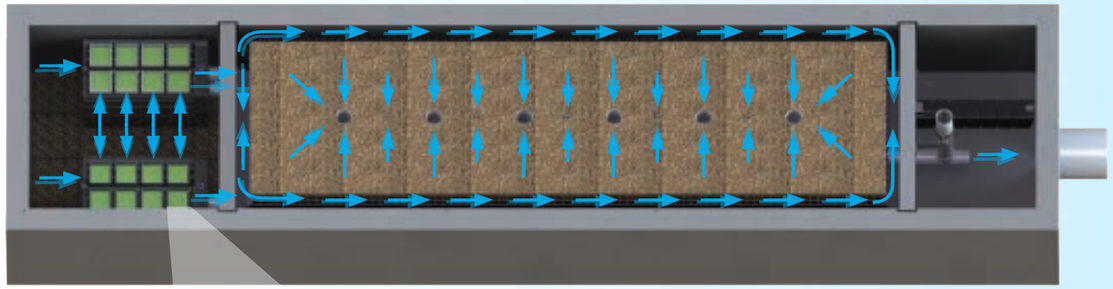
- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The Modular Wetlands® System Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which:

- Improves performance
- Reduces footprint
- Minimizes maintenance

Figure 1 & Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.



2x to 3x more surface area than traditional downward flow bioretention systems.

Figure 2, Top View

1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

PRE-FILTER CARTRIDGES

- Over 25 sq. ft. of surface area per cartridge
- Utilizes BioMediaGREEN™ filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber

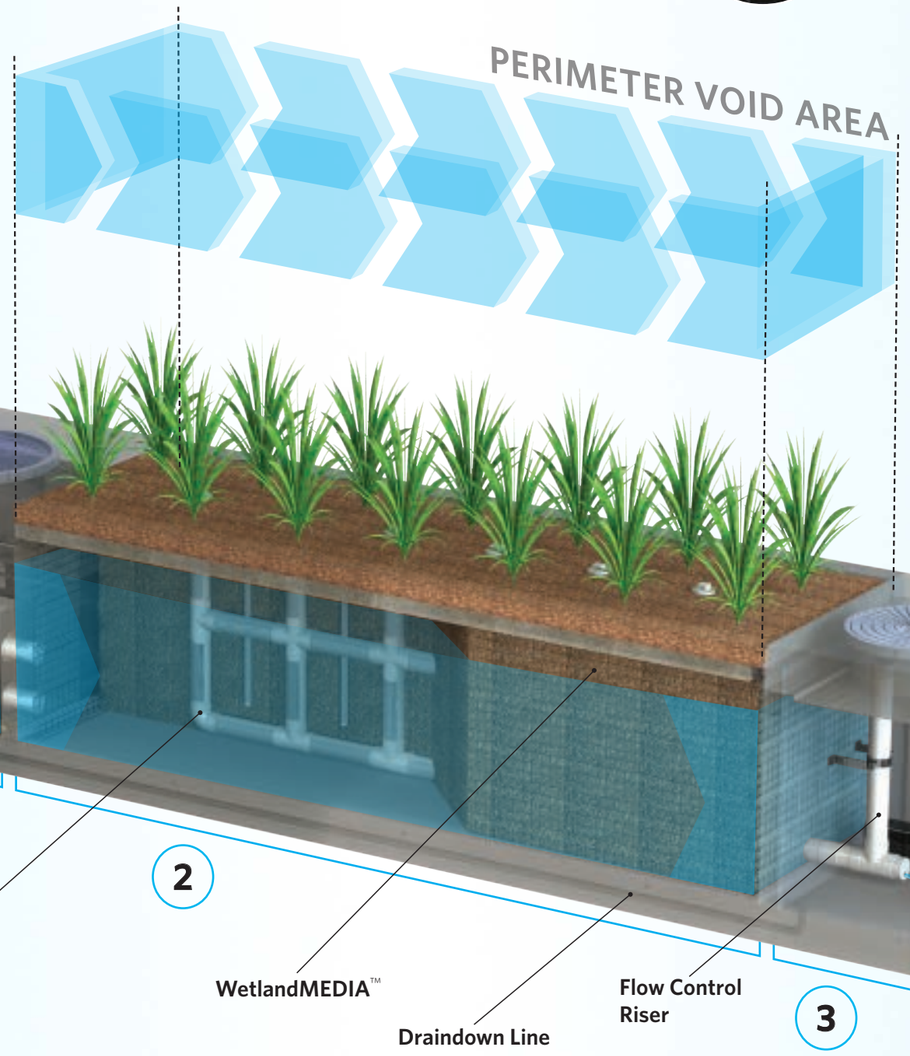


Figure 1

2 BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA™ on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

3 DISCHARGE

FLOW CONTROL

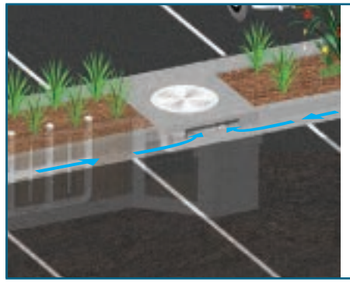
- Orifice plate controls flow of water through WetlandMEDIA™ to a level lower than the media's capacity
- Extends the life of the media and improves performance

DRAINDOWN FILTER

- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated

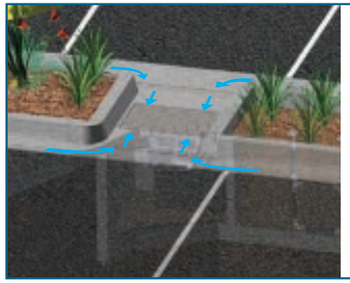
CONFIGURATIONS

The Modular Wetlands® System Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.



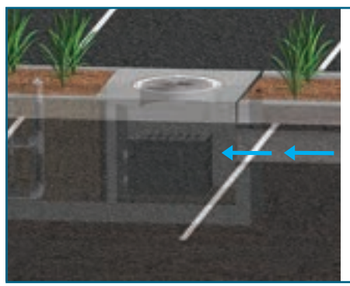
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

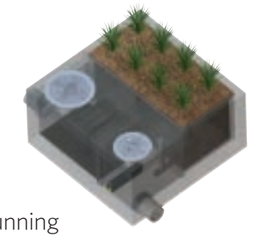
The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the Modular Wetlands® can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/ bioretention systems. Another benefit of the "pipe-in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

DOWNSPOUT TYPE

The Downspout Type is a variation of the Vault Type and is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

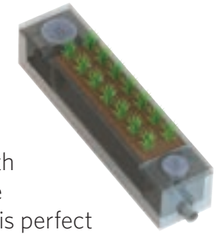
ORIENTATIONS

SIDE-BY-SIDE



The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

END-TO-END



The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.

BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

EXTERNAL DIVERSION WEIR STRUCTURE

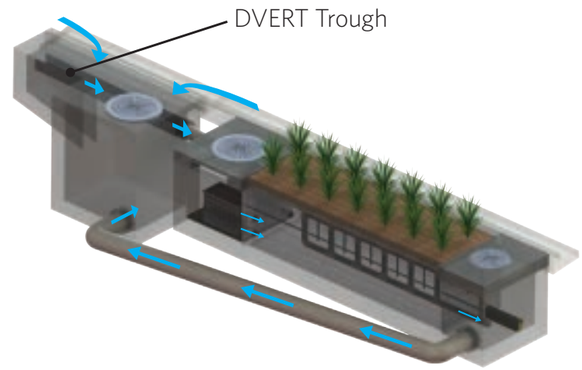
This traditional offline diversion method can be used with the Modular Wetlands® in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the Modular Wetlands® for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the Modular Wetlands® and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION

This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the Modular Wetlands® via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over



to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the Modular Wetlands® to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED DESIGNS

The Modular Wetlands® System Linear can be used in stand-alone applications to meet treatment flow requirements. Since the Modular Wetlands® is the only biofiltration system that can accept inflow pipes several feet below the surface, it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

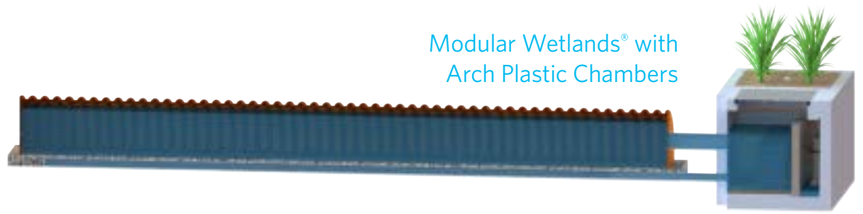
MODEL #	DIMENSIONS	WETLANDMEDIA SURFACE AREA (sq. ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4′ x 4′	23	0.052
MWS-L-4-6	4′ x 6′	32	0.073
MWS-L-4-8	4′ x 8′	50	0.115
MWS-L-4-13	4′ x 13′	63	0.144
MWS-L-4-15	4′ x 15′	76	0.175
MWS-L-4-17	4′ x 17′	90	0.206
MWS-L-4-19	4′ x 19′	103	0.237
MWS-L-4-21	4′ x 21′	117	0.268
MWS-L-6-8	7′ x 9′	64	0.147
MWS-L-8-8	8′ x 8′	100	0.230
MWS-L-8-12	8′ x 12′	151	0.346
MWS-L-8-16	8′ x 16′	201	0.462
MWS-L-8-20	9′ x 21′	252	0.577
MWS-L-8-24	9′ x 25′	302	0.693
MWS-L-10-20	10' x 20'	302	0.693

VOLUME-BASED DESIGNS

HORIZONTAL FLOW BIOFILTRATION ADVANTAGE

Modular Wetlands® with
Box Culvert Prestorage

The Modular Wetlands® System Linear offers a unique advantage in the world of biofiltration due to its exclusive horizontal flow design: Volume-Based Design. No other biofilter has the ability to be placed downstream of detention ponds, extended dry detention basins, underground storage systems and permeable paver reservoirs. The systems horizontal flow configuration and built-in orifice control allows it to be installed with just 6" of fall between inlet and outlet pipe for a simple connection to projects with shallow downstream tie-in points. In the example above, the Modular Wetlands® is installed downstream of underground box culvert storage. Designed for the water quality volume, the Modular Wetlands® will treat and discharge the required volume within local draindown time requirements.



Modular Wetlands® with
Arch Plastic Chambers

DESIGN SUPPORT

Bio Clean engineers are trained to provide you with superior support for all volume sizing configurations throughout the country. Our vast knowledge of state and local regulations allow us to quickly and efficiently size a system to maximize feasibility. Volume control and hydromodification regulations are expanding the need to decrease the cost and size of your biofiltration system. Bio Clean will help you realize these cost savings with the Modular Wetlands®, the only biofilter than can be used downstream of storage BMPs.

ADVANTAGES

- LOWER COST THAN FLOW-BASED DESIGN
- MEETS LID REQUIREMENTS
- BUILT-IN ORIFICE CONTROL STRUCTURE
- WORKS WITH DEEP INSTALLATIONS

APPLICATIONS

The Modular Wetlands® System Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

INDUSTRIAL

Many states enforce strict regulations for discharges from industrial sites. The Modular Wetlands® has helped various sites meet difficult EPA-mandated effluent limits for dissolved metals and other pollutants.

RESIDENTIAL

Low to high density developments can benefit from the versatile design of the Modular Wetlands®. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.

STREETS

Street applications can be challenging due to limited space. The Modular Wetlands® is very adaptable, and it offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

PARKING LOTS

Parking lots are designed to maximize space and the Modular Wetlands'® 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

COMMERCIAL

Compared to bioretention systems, the Modular Wetlands® can treat far more area in less space, meeting treatment and volume control requirements.

MIXED USE

The Modular Wetlands® can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications include:

• Agriculture • Reuse • Low Impact Development • Waste Water

PLANT SELECTION

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the Modular Wetlands® System Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade, the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the Modular Wetlands®, giving the plants more contact time so that pollutants are more successfully decomposed, volatilized, and incorporated into the biomass of the Modular Wetlands'® micro/macro flora and fauna.

A wide range of plants are suitable for use in the Modular Wetlands®, but selections vary by location and climate. View suitable plants by visiting biocleanenvironmental.com/plants.

INSTALLATION

The Modular Wetlands® is simple, easy to install, and has a space-efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles precast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians is available to supervise installations and provide technical support.

MAINTENANCE

Reduce your maintenance costs, man hours, and materials with the Modular Wetlands®. Unlike other biofiltration systems that provide no pretreatment, the Modular Wetlands® is a self-contained treatment train which incorporates simple and effective pretreatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pretreatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pretreatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long-term operation, and there is absolutely no need to replace expensive biofiltration media.

Bio Clean
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PERFORMANCE SUMMARY

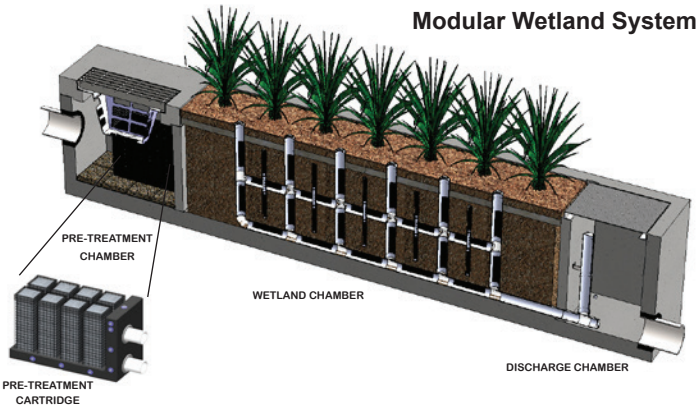
MWS-LINEAR 2.0

Application: Stand Alone Stormwater Treatment Best Management Practice
Type of Treatment: High Flow Rate Media Filtration and Biofiltration (dual-stage)

DESCRIPTION

Modular Wetland System Linear 2.0 (MWS-L 2.0) is an advanced dual-stage high flow rate media and biofiltration system for the treatment of urban stormwater runoff. Superior pollutant removal efficiencies are achieved by treating runoff through a pre-treatment chamber containing a screening device for trash and larger debris, a separation chamber for larger TSS and a series of media filter cartridges for removal of fine TSS and other particulate pollutants. Pre-treated runoff is transferred to the biofiltration chamber which contains an engineered ion exchange media designed to support an abundant plant and microbe community that captures, absorbs, transforms and uptakes pollutants through an array of physical, chemical, and biological mechanisms.

MWS-L 2.0 is a self-contained treatment train that is supplied to the job site completely assembled and ready for use. Once installed, stormwater runoff drains directly from impervious surfaces through an built-in curb inlet, drop in, or via pipe from upstream inlets or downspouts. Treated runoff is discharged from the system through an orifice control riser to assure the proper amount of flow is treated. The treated water leaving the system is connected to the storm drain system, infiltration basins, or to be re-used on site for irrigation or other uses.



Modular Wetland System Linear 2.0 (MWS-L 2.0) has been independently tested in laboratory and field conditions since 2008.

Oceanside Test Site

Portland Test Site

HEAVY METALS: Copper / Zinc

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.76 / .95	.06 / .19	92% / 80%	Majority Dissolved Fraction
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.04 / .24	< .02 / < .05	>50% / >79%	Effluent Concentrations Below Detectable Limits
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.058 / .425	.032 / .061	44% / 86%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	.017/ .120	.009 / .038	50% / 69%	Total Metals

TOTAL SUSPENDED SOLIDS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	270	3	99%	Sil-co-sil 106 - 20 micron mean particle size
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	45.67	8.24	82%	Mean Particle Size by Count < 8 Microns
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	676	39	94%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	75.0	15.7	85%	Means particle size of 8 microns

Modular Wetland System, Inc.
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MODULAR WETLANDS™
Nature & Technology Working Together In Perfect Harmony™

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PERFORMANCE SUMMARY

MWS-LINEAR 2.0

PHOSPHORUS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
TAPE Field Testing / Portland, OR 2011/2012	Field	.227	.074	64%	TOTAL P
TAPE Field Testing / Portland, OR 2011/2012	Field	.093	.031	67%	ORTHO P

BACTERIA:

Description	Type	Avg. Influent (MPN)	Avg. Effluent (MPN)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	1600 / 1600	535 / 637	67% / 60%	Fecal / E. Coli
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	31666 / 6280	8667 / 1058	73% / 83%	Fecal / E. Coli

LEAD:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.54	.10	82%	Total
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.01 / .043	.004 / .014	60% / 68%	Both Test Units
TAPE Field Testing / Portland, OR 2011/2012	Field	.011	.003	70%	Total

NITROGEN:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.85	.21	75%	NITRATE
TAPE Field Testing / Portland, OR 2011/2012	Field	1.40	0.77	45%	TKN

HYDROCARBONS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	10	1.625	84%	Oils & Grease
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.83	0	100%	TPH Motor Oil
TAPE Field Testing / Portland, OR 2011/2012	Field	24.157	1.133	95%	Motor Oil

TURBIDITY:

Description	Type	Avg. Influent (NTU)	Avg. Effluent (NTU)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	21	1.575	93%	Field Measurement
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	21	6	71%	Field Measurement

COD:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	516 / 1450	90 / 356	83% / 75%	Both Test Units

All removal efficiencies and concentrations rounded up for easy viewing. Please call us for more information, including full copies of the reports reference above.

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MODULAR WETLANDS™

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Modular Wetlands and Pesticides

Independent field data using the Modular Wetlands System was obtained showing the removal of Tetrachlorphenol and Pentachlorophenol (herbicides/pesticides). The following test results outline the analyte removal results in mg/Kg.

Analyte	Sample A Inlet mg/Kg	Sample B Outlet mg/Kg	Sample C Inlet mg/Kg	Sample D Outlet mg/Kg
Oil	6980	<560 **-92%**	5260	<530 **-90%**
Tetrachlorophenol 5	3.4	<2.5 **-26%**	4.6	<2.5 **-46%**
Tetrachlorophenol 6	9	4.9 **-46%**	9.7	5.4 **-44%**
Pentachlorophenol	47	16 **-66%**	52	22 **-58%**

*Data sample matrix consisted of untreated influent water and was conducted independently by SPECTRA Laboratories

Percent reductions calculated and added to above table by WQMP preparer.

Sean M. Hasan

Western Regional Director

Bio Clean
A Forterra Company

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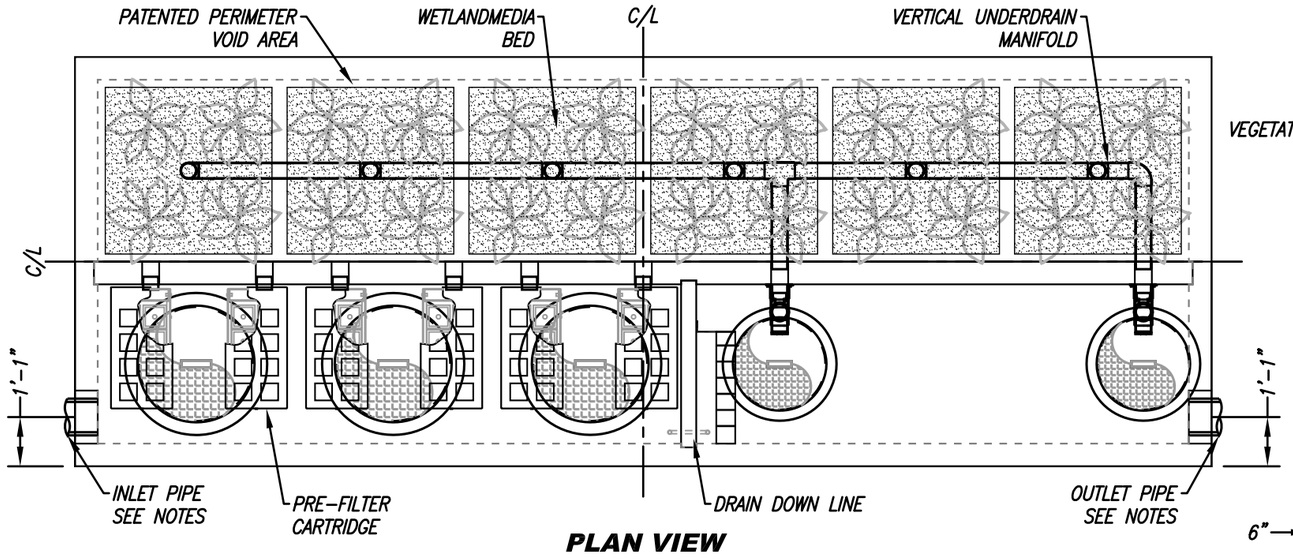
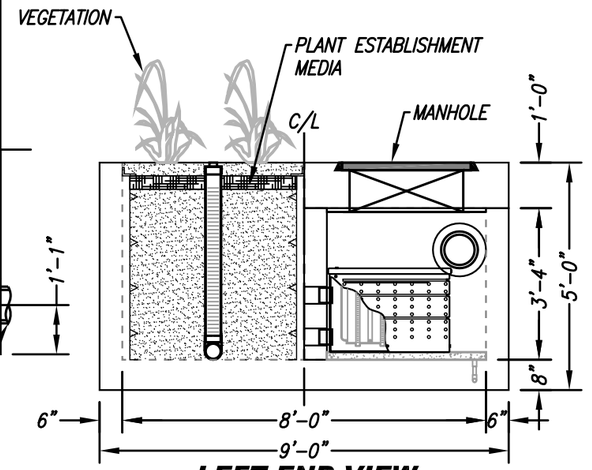
SITE SPECIFIC DATA			
PROJECT NUMBER			
ORDER NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	PEDESTRIAN
FRAME & COVER	3 EA ø30"	N/A	2 EA ø24"
WETLANDMEDIA VOLUME (CY)			TBD
ORIFICE SIZE (DIA. INCHES)			TBD
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			



PLAN VIEW



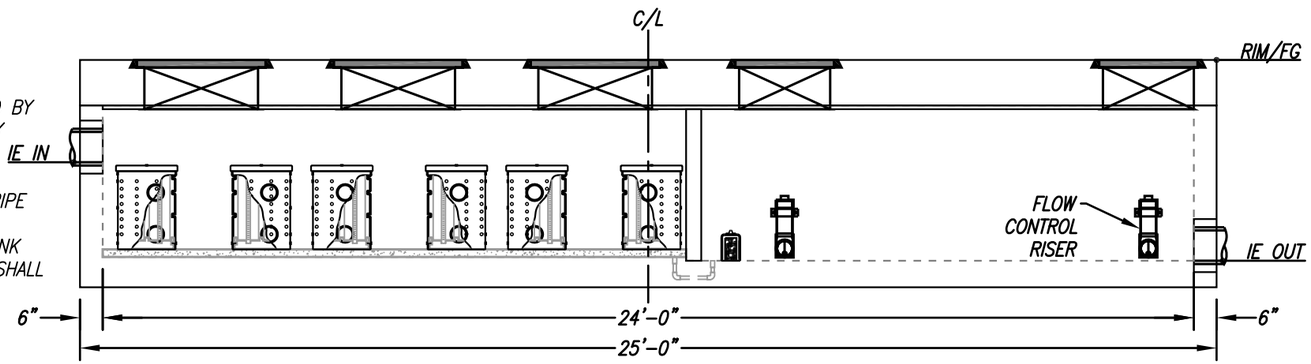
LEFT END VIEW

INSTALLATION NOTES

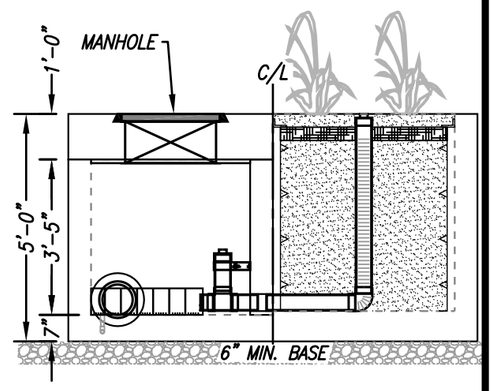
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.



ELEVATION VIEW

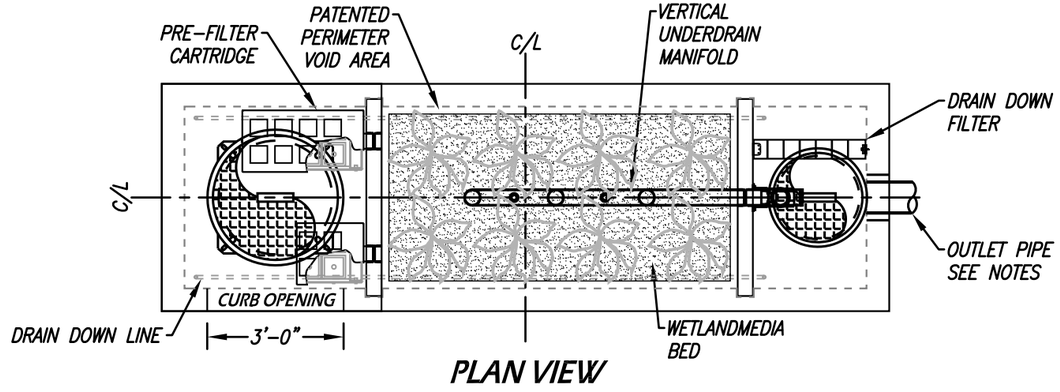


RIGHT END VIEW

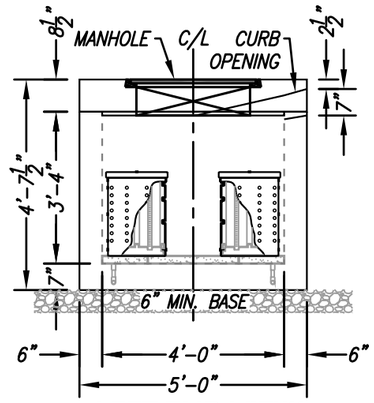
TREATMENT FLOW (CFS)	0.693
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	2.0
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-24-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

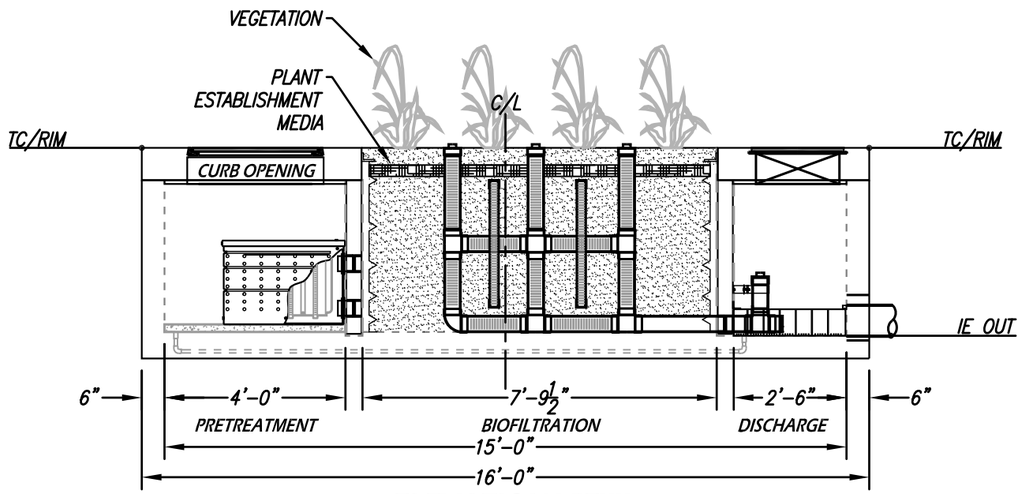
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			4.30
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.89"
MAXIMUM PICK WEIGHT (LBS)			31000
NOTES:			



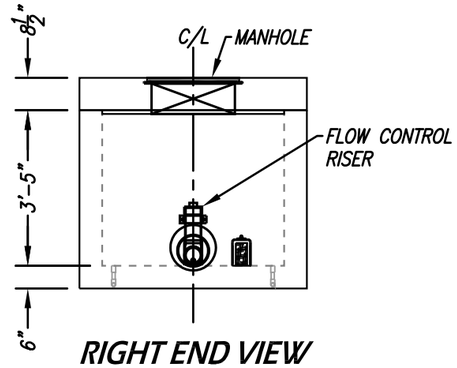
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



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TREATMENT FLOW (CFS)	0.175
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS
www.ModularWetlands.com | (855) 5MOD-WET

MWS-L-4-15-C
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

WASHINGTON STATE DEPARTMENT OF ECOLOGY

July 2017

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment

    - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:

   - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
   - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
   - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. The applicant tested the MWS – Linear Modular Wetland Stormwater Treatment System with an external bypass weir. This weir limited the depth of water flowing through the media, and therefore the active treatment area, to below the root zone of the plants. This GULD applies to MWS – Linear Modular Wetland Stormwater Treatment Systems whether plants are included in the final product or not.
5. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.

   - Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
   - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
   - Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific

maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
    - Standing water remains in the vault between rain events, or
    - Bypass occurs during storms smaller than the design storm.
    - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
    - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Modular Wetland Systems, Inc.
Applicant's Address:	*PO. Box 869* *Oceanside, CA 92054*

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan*: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014*
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014.*

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

<u>Laboratory Testing</u>

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).
- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:

Applicant: Zach Kent
BioClean A Forterra Company.
398 Vi9a El Centro
Oceanside, CA 92058
zach.kent@forterrabp.com

Applicant website: http://www.modularwetlands.com/

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	**Revision**
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment
December 2015	Updated GULD to document the acceptance of MWS-Linear Modular Wetland installations with or without the inclusion of plants
July 2017	Revised Manufacturer Contact Information (name, address, and email)

Installation Guidelines for Modular Wetland System

Delivery & Unloading/Lifting

1. Modular Wetland Systems, Inc. shall deliver the unit(s) to the site in coordination with the Contractor.

2. The Contractor will require spreader bars and chains/cables to safely and securely lift the main structure, risers a set of suitable lifting hooks, knuckles, shackles and eye bolts.

3. The main structure and lid can be lifted together or separately.

   Please see Modular Wetland Weights and Lifting Details. Contact Modular Wetlands for additional lifting details.

Inspection

1. Inspection of the Modular Wetland unit and all parts contained in or shipped outside of the unit shall be inspected at time of delivery by the site Engineer/Inspector and the Contractor. Any non-conformance to approved drawings or damage to any part of the system shall be documented on the Modular Wetland shipping ticket. Damage to the unit during and after unloading shall be corrected at the expense of the Contractor. Any necessary repairs to the Modular Wetland unit shall be made to the acceptance of the Engineer/Inspector.

Site Preparation

1. The Contractor is responsible for providing adequate and complete site/inlet protection when the Modular Wetland unit is installed prior to final site stabilization (full landscaping, grass cover, final paving, and street sweeping completed).

2. The Contractor shall adhere to all jurisdictional and/or OSHA safety rules in providing temporary shoring of the excavation.

3. The Contractor or Owner is responsible for appropriately barricading the Modular Wetland unit from traffic (in accordance with local codes).

Installation Guidelines for Modular Wetland System

Installation

1. Each unit shall be constructed at the locations and elevations according to the sizes shown on the approved drawings. Any modifications to the elevation or location shall be at the direction of and approved by the Engineer.

2. The unit shall be placed on the compacted sub-grade with a minimum 6-inch gravel base matching the final grade of the curb line in the area of the unit. The unit is to be placed such that the unit and top slab match the grade of the curb in the area of the unit. Compact undisturbed sub-grade materials to 95% of maximum density at +1% to 2% of the optimum moisture. Unsuitable material below sub-grade shall be replaced to site engineer's approval. Please see Modular Wetlands Weights and Lifting Details. Contact Modular Wetlands for guidance where slope exceeds 5%.

3. Once the unit is set, the internal wooden forms and protective silt fabric cover must be left intact (if WetlandMedia pre-installed). The top lid(s) should be sealed onto the box section before backfilling, using a non-shrink grout, butyl rubber or similar waterproof seal. The boards on the top of the lid and boards sealed in the unit's throat must NOT be removed. The Supplier will remove these sections at the time of activation.

4. Outlet connections shall be aligned and sealed to meet the approved drawings with modifications necessary to meet site conditions and local regulations. The correct outlet will be marked on the Modular Wetland unit.

5. Backfilling should be performed in a careful manner, bringing the appropriate fill material up in 6-inch lifts on all sides. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of the Modular Wetland unit shall conform to ASTM specification C891 "Standard Practice for Installation of Underground Precast Utility Structures" unless specified otherwise in contract documents.

6. It is the responsibility of the Contractor to provide curb and gutter and transition to the Modular Wetland unit for proper stormwater flow into the system through the throat, pipe or grate opening. A standard drawing of the throat and gutter detail is available in the following section; however the plans and contract documents supersede all standard drawings. Several variations of the standard design are available. Effective bypass for the Modular Wetland System is essential for correct operation (i.e. bypass to an overflow at lower elevation).

Installation Procedure

The contractor **MUST** provide all rigging And lifting apparatus, such as all cables, chains or straps and a set of lifting hooks, shackles, knuckles and eye bolts.

It is the contractor's responsibility to provide suitable lifting equipment to off-load the Modular Wetland unit.

Modular Wetland units are designed to be off-loaded using the contractor's spreader bar.

1. Apply Butyl Tape Seal

Apply butyl tape seal along the top of the box section. Butyl tape seal is provided with every unit.

Modular Wetland installed protective throat board and installed silt fabric must be left in place to protect the unit from construction sediment.

2. Unload and Set Box

Unload the Modular Wetland unit
the prepared hole with appropriate sub-grade.*

* Compacted sub-grade with a minimum
of six inches of gravel base which must match
the final grade of curb line the area of the unit.

3. Set Top On Box

Set the top slab on the box.

The Contractor is responsible for providing
adequate and complete site/inlet protection
when the Modular Wetland is installed prior
to final site stabilization (full landscaping,
grass cover, final paving, and street sweeping
completed).

4. Connect Outfall Pipe

The correct outlet will be marked on the
Modular Wetland.

Invert of outlet pipe **MUST** be even
with the floor of the system.

5. Install Curb & Gutter

It is the responsibility of the Contractor to provide curb and gutter and transition to the Modular Wetland for proper flow into the system through a 5”- 7” throat opening. A standard drawing of the throat and gutter detail in the following section. CONTRACTOR RESPONSIBLE FOR GROUTING IN ANY VISIBLE LIFTING POINTS.

6. Activation

Activation is performed **ONLY** by Modular Wetland personnel.

Activation can occur once the project site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed) and there is a 5” - 7” throat opening.

Call 760-433-7640 to schedule your activation.

NOTE: WetlandMedia Installation

For Larger models (MWS-L-4-13 and above) the system will be delivered without WetlandMedia pre-installed to minimize pick weight and prevent contamination of the media during construction. For these models the WetlandMedia will be delivered in bulk or in super sacks. It will be responsibility of the contractor to fill the system with the WetlandMedia during the installation process. Installation of the WetlandMedia can be done after the unit is fully installed to avoid contamination. See following pages for details.

WetlandMedia Install (if applicable)

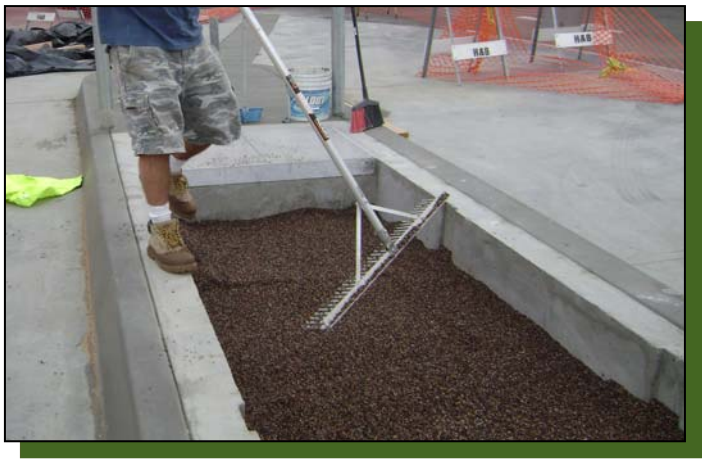
1. Fill WetlandMedia

Position super sack of WetlandMedia over wetland chamber. Bottom of sack should not be more than 2' above top of system. Open sack and fill evenly*.

* One to several hundred cubic yards of WetlandMedia will be required based upon the model number and size of the system. For large scale jobs WetlandMedia will be delivered in bulk and will require a bobcat of similar to fill the system. All equipment is the responsibility of the contractor.

2. Install Plant Propagation Layer

Fill WetlandMedia up to 9" below the top of the wetland chamber. Level out the WetlandMedia as shown. Ensure that the level does not vary more than one inch or plant growth will be affected.

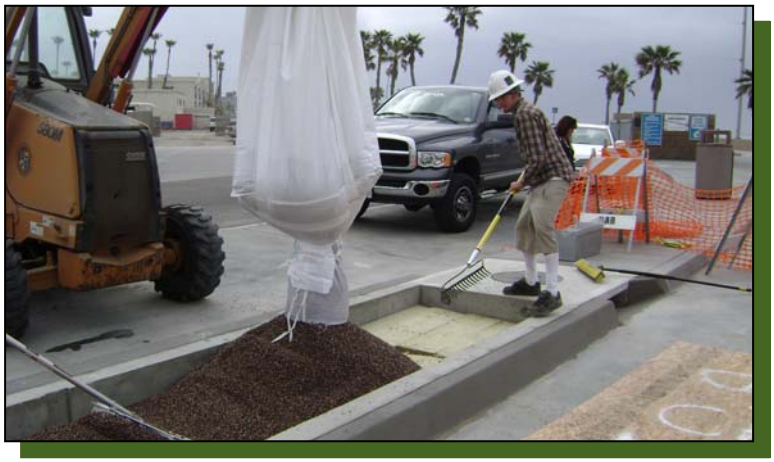


3. Install Plant Propagation Layer

Utilize plant propagation blocks provided by the manufacturer. Each block is approximately 40" by 6" by 3" thick. Blocks shall be placed side by side and end to end and cover the entire length and width of the wetland chamber unless specified.

4. Finish Filling WetlandMedia

After plant propagation blocks are installed repeat step 1 and fill the system to the top of the wetland chamber as shown. WetlandMedia must be filled within 2” of the top of the unit.



5. Planting

After system is filled with WetlandMedia planting of vegetation can begin. Utilizing 1 gallon plants dig down until The plant propagation blocks are reached. Remove plant and it’s root ball from the container. Set the bottom of the root ball on the tops of the blocks. Fill hole back in with WetlandMedia. After planting a thorough watering of the plants is necessary. The plant propagation blocks must be saturated to provide a water source for the plants during the establishment phase. It is recommended that hand watering is done three times a week for the first two months. Hand water can be supplemented with drip or spray irrigation after the second week. Please call the manufacturer for more details on plants, planting arrangement and irrigation options.

NOTE: planting is required on all units, including units delivered with WetlandMedia pre-installed.

Weights and Lifting Details

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

MWS-L 2.0 Max Pick Weights

Model #	Size (O.D)	Size (I.D)	Unit Weight (lbs)	Media Weight (lbs)	Total Weight (lbs)
MWS-L-4-4	5' x 5'	4' x 4'	7500.0	1607.7	9107.7
MWS-L-4-6 MWS-L-4-6.5	5' x 7' 5 x 7.5'	4' x 6' 4' x 6.5'	11,000 11,500	1798.9	12,619.2 13,119.2
MWS-L-4-8	5' x 9'	8' x 4'	12500	3966	16466
MWS-L-4-13	5' x 14'	13' x 4'	21200	5895	27095
MWS-L-4-15	5' x 16'	15' x 4'	23700	8039	31739
MWS-L-4-17	5' x 18'	17' x 4'	26500	10182	36682
MWS-L-4-19	5' x 20'	19' x 4'	28300	12326	40626
MWS-L-4-21	5' x 22'	21' x 4'	30000	14470	44470
MWS-L-6-8	7' x 9'	6' x 8'	24000	6109	30109
MWS-L-8-8	9' x 9'	8' x 8'	32000	8253	40253
MWS-L-8-12	9' x 13'	8' x 12'	44000	12540	56540
MWS-L-8-16	9' x 17'	8' x 16'	47000	16828	63828
			Max Pick Weight if Shipped Without Media Installed		Max Pick Weight if Shipped With Media Installed

Note: All weights listed hereon are standard max pick weights, actual pick weights may vary based upon state and local regulations and variation in concerte and rebar standards. For project specific pick weights contact the manufacturer prior to shipping of the unit(s). Is is the contractors responsibility to off-load the unit with an adequate size crane. Units are shipped with WetlandMEDIA in superbags and installed by contractor.

When Available see project contract terms, if lifting points are on the inside of the unit due to custom designs or installations requiring pionts to be on the inside the media will be shipped in bags and the contractor will be reponsibile to install after the unit is installed. For example, units places against a wall.

For Questions or Comments Please Call 888-566-3938 or email: info@modularwetlands.com

MODULAR WETLANDS™

Connection Details

Modular Wetland System, Inc.
P. 760.433-7640
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Section [_____]
Modular Subsurface Flow Wetland System

PART 1 – GENERAL

01.01.00 Purpose
The purpose of this specification is to establish generally acceptable criteria for Modular Subsurface Flow Wetland Systems used for biofiltration of stormwater runoff including dry weather flows and other contaminated water sources. It is intended to serve as a guide to producers, distributors, architects, engineers, contractors, plumbers, installers, inspectors, agencies and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification of devices complying with this specification.

01.02.00 Description
Modular Subsurface Flow Wetland Systems (MSFWS) are used for filtration of stormwater runoff including dry weather flows. The MSFWS is a pre-engineered biofiltration system composed of a pretreatment chamber containing filtration cartridges, a horizontal flow biofiltration chamber with a peripheral void area and a centralized and vertically extending underdrain, the biofiltration chamber containing a sorptive media mix which does not contain any organic material and a layer of plant establishment media, and a discharge chamber containing an orifice control structure . Treated water flows horizontally in series through the pretreatment chamber cartridges, biofiltration chamber and orifice control structure.

01.03.00 Manufacturer
The manufacturer of the MSFWS shall be one that is regularly engaged in the engineering design and production of systems developed for the treatment of stormwater runoff for at least (10) years, and which have a history of successful production, acceptable to the engineer of work. In accordance with the drawings, the MSFWS(s) shall be a filter device Manufactured by Bio Clean Environmental Services, Inc., or Modular Wetland Systems, Inc., or assigned distributors or licensees. Bio Clean Environmental Services Inc., and Modular Wetland Systems, Inc., can be reached at:

Corporate Headquarters:
Bio Clean Environmental Service, Inc.
2972 San Luis Rey Road
Oceanside, CA 92058
Phone: (760) 433-7640
Fax: (760) 433-3176
www.biocleanenvironmental.net

Corporate Headquarters:
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92049
Phone: (760) 433-7650
www.modularwetlands.net

01.04.00 Submittals

01.04.01 Shop drawings are to be submitted with each order to the contractor and consulting engineer.

01.04.02 Shop drawings are to detail the MSFWS and all components required and the sequence for installation, including:

- System configuration with primary dimensions
- Interior components
- Any accessory equipment called out on shop drawings

01.04.03 Inspection and maintenance documentation submitted upon request.

01.05.00 Work Included

01.05.01 Specification requirements for installation of MSFWS.

01.05.02 Manufacturer to supply components of the MSFWS(s):

- Pretreatment chamber components (pre-assembled)
- Concrete Structure(s)
- Biofiltration chamber components (pre-assembled)
- Flow control discharge structure (pre-assembled)

01.06.00 Reference Standards

ASTM C 29	Standard Test Method for Unit Weight and Voids in Aggregate
ASTM C 88	C 88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C131	C 131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregates by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 330	C 330 Standard Specification for Lightweight Aggregate for Structural Concrete
ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft.-lbf/ft3 (600 kN-m/m3)
ASTM D 1621	10 Standard Test Method for Compressive Properties Of Rigid Cellular Plastics
ASTM D 1777	ASTM D1777 - 96(2007) Standard Test Method for Thickness of Textile Materials
ASTM D 4716	Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
AASHTO T 99-01	Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in) Drop
AASHTO T 104	Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T 260	Standard Method of Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials.
AASHTO T 288	Standard Method of Test for Determining Minimum Laboratory Soil Resistivity
AASHTO T 289	Standard Method of Test for Determining ph of Soil for Use in Corrosion Testing
AASHTO T 291	Standard Method of Test for Determining Water Soluble Chloride Ion Content in Soil
AASHTO T 290	T 290 Standard Method of Test for Determining Water Soluble Sulfate Ion Content in Soil

PART 2 – COMPONENTS

The Modular Subsurface Flow Wetland Systems (MSFWS) and all of its components shall be self-contained within a concrete structure constructed of concrete with a minimum 28 day compressive strength of 5,000 psi, with reinforcing per ASTM A 615, Grade 60, and supports and H20 loading as indicated by AASHTO. Each Chamber shall have appropriate access hatches for easy maintenance and sized to allow removal of all internal components without disassembly. All water transfer system components shall conform with the following;

- Filter netting shall be 100% Polyester with a number 16 sieve size, and strength tested per ASTM D 3787.
- Drainage cells shall be manufactured of lightweight injection-molded plastic and have a minimum compressive strength test of 6,000 psi and a void area along the surface making contact with the filter media of 75% or greater. The cells shall be at least 2" in thickness and allow water to freely flow in all four directions.

02.01.00 Pretreatment Chamber Components

02.01.01 Filter Cartridges shall operate at a loading rate not to exceed 3 gallons per minute per square foot surface area.

02.01.02 Drain Down System shall include a pervious floor that allows water to drain into the underdrain pipe that is connected to the discharge chamber.

02.02.00 Biofiltration Chamber Components

02.02.01 Media shall consist of ceramic material produced by expanding and vitrifying select material in a rotary kiln. Media must be produced to meet the requirements of ASTM C330, ASTM C331, and AASHTO M195. Aggregates must have a minimum 24-hour water absorption of 10.5% mass. Media shall not contain any organic material. Flow through media shall be horizontal from the outer perimeter of the chamber toward the centralized and vertically extending underdrain. The retention time in the media shall be at least 3 minutes. Downward flow filters are not acceptable alternatives. The thickness of the media shall be at least 19" from influent end to effluent end. The loading rate on the media shall not exceed 1.1 gallons per minute per square foot surface area. Media must be contained within structure that spaces the surface of the media at least 2" from all vertically extending walls of the concrete structure.

02.02.02 Planting shall be native, drought tolerant species recommend by manufacturer and/or landscape architect.

02.02.03 Plant Support Media shall be made of a 3" thick moisture retention cell that is inert and contains no chemicals or fertilizers, is not made of organic material and has an internal void percentage of 80%.

02.03.00 Discharge Chamber

The discharge device shall house a flow control orifice plate that restricts flows greater than designed treatment flow rate. All piping components shall be made of a high-density polyethylene. The discharge chamber shall also contain a drain down filter if specified on the drawing.

PART 3 – PERFORMANCE

03.01.00 General

03.01.01 Function - The MSFWS has no moving internal components and functions based on gravity flow, unless otherwise specified. The MSFWS is composed of a pretreatment chamber, a biofiltration chamber and a discharge chamber. The pretreatment device houses cartridge media filters, which consist of filter media housed in a perforated enclosure. The untreated runoff flows into the system via subsurface piping and or surface inlet. Water entering the system is forced through the filter cartridge enclosures by gravity flow. Then the flow contacts the filter media. The flow through the media is horizontal toward the center of each individual media filter. In the center of the media shall be a round slotted PVC pipe of no greater than 1.5" in diameter. The slotted PVC pipe shall extend downward into the water transfer cavity of the cartridge. The slotted PVC pipe shall be threaded on the bottom to connect to the water transfer cavity. After pollutants have been removed by the filter media the water discharges the pretreatment chamber and flows into the water transfer system and is conveyed to the biofiltration chamber. Once runoff has been filtered by the biofiltration chamber it is collected by the vertical underdrain and conveyed to a discharge chamber equipped with a flow control orifice plate. Finally the treated flow exits the system.

03.01.02 Pollutants - The MSFWS will remove and retain debris, sediments, TSS, dissolved and particulate metals and nutrients including nitrogen and phosphorus species, bacteria, BOD, oxygen demanding substances, organic compounds and hydrocarbons entering the filter during frequent storm events and continuous dry weather flows.

03.01.03 Treatment Flow Rate and Bypass - The MSFWS operates in-line. The MSFWS will treat 100% of the required water quality treatment flow based on a minimum filtration capacities listed in section 03.02.00. The size of the system must match those provided on the drawing to ensure proper performance and hydraulic residence time.

Minimum Treatment Capabilities

• System must be capable of treating flows to the specified treatment flow rate on the drawings. The flow rate shall be controlled by an orifice plate.

PART 4 - EXECUTION

04.01.00 General

The installation of the MSFWS shall conform to all applicable national, state, state highway, municipal and local specifications.

04.02.00 Installation

The Contractor shall furnish all labor, equipment, materials and incidentals required to install the (MSFWS) device(s) and appurtenances in accordance with the drawings and these specifications.

04.02.01 Grading and Excavation site shall be properly surveyed by a registered professional surveyor, and clearly marked with excavation limits and elevations. After site is marked it is the responsibility of the contractor to contact local utility companies and/or DigAlert to check for underground utilities. All grading permits shall be approved by governing agencies before commencement of grading and excavation. Soil conditions shall be tested in accordance with the governing agencies requirements. All earth removed shall be transported, disposed, stored, and handled per governing agencies standards. It is the responsibility of the contractor to install and maintain proper erosion control measures during grading and excavation operations.

04.02.02 Compaction – All soil shall be compacted per registered professional soils engineer's recommendations prior to installation of MSFWS components.

04.02.03 Backfill shall be placed according to a registered professional soils engineer's recommendations, and with a minimum of 6" of gravel under all concrete structures.

04.02.04 Concrete Structures – After backfill has been inspected by the governing agency and approved the concrete structures shall be lifted and placed in proper position per plans.

04.02.05 Subsurface Flow Wetland Media shall be carefully loaded into area so not to damage the Wetland Liner or Water Transfer Systems. The entire wetland area shall be filled to a level 9 inches below finished surface.

04.02.06 Planting layer shall be installed per manufacturer's drawings and consist of a minimum 3" grow enhancement media that ensures greater than 95% plant survival rate, and 6" of wetland media. Planting shall consist of native plants recommended by manufacturer and/or landscape architect. Planting shall be drip irrigated for at least the first 3 months to insure long term plant growth. No chemical herbicides, pesticides, or fertilizers shall be used in the planting or care and maintenance of the planted area.

04.03.00 Shipping, Storage and Handling

04.03.01 Shipping – MSFWS shall be shipped to the contractor's address or job site, and is the responsibility of the contractor to offload the unit(s) and place in the exact site of installation.

04.03.02 Storage and Handling– The contractor shall exercise care in the storage and handling of the MSFWS and all components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be born by the contractor. The MSFWS(s) and all components shall always be stored indoors and transported inside the original shipping container until the unit(s) are ready to be installed. The MSFWS shall always be handled with care and lifted according to OSHA and NIOSA lifting recommendations and/or contractor's workplace safety professional recommendations.

04.04.00 Maintenance and Inspection

04.04.01 Inspection – After installation, the contractor shall demonstrate that the MSFWS has been properly installed at the correct location(s), elevations, and with appropriate components. All components associated with the MSFWS and its installation shall be subject to inspection by the engineer at the place of installation. In addition, the contractor shall demonstrate that the MSFWS has been installed per the manufacturer's specifications and recommendations. All

components shall be inspected by a qualified person once a year and results of inspection shall be kept in an inspection log.

04.04.02 Maintenance – The manufacturer recommends cleaning and debris removal maintenance of once a year and replacement of the Cartridge Filters as needed. The maintenance shall be performed by someone qualified. A Maintenance Manual is available upon request from the manufacturer. The manual has detailed information regarding the maintenance of the MSFWS. A Maintenance/Inspection record shall be kept by the maintenance operator. The record shall include any maintenance activities preformed, amount and description of debris collected, and the condition of the filter.

04.04.03 Material Disposal - All debris, trash, organics, and sediments captured by the MSFWS shall be transported and disposed of at an approved facility for disposal in accordance with local and state requirements. Please refer to state and local regulations for the proper disposal of toxic and non-toxic material.

PART 5 – QUALITY ASSURNACE

05.01.00 Warranty

The Manufacturer shall guarantee the MSFWS against all manufacturing defects in materials and workmanship for a period of (5) years from the date of delivery to the _____. The manufacturer shall be notified of repair or replacement issues in writing within the warranty period. The MSFWS is limited to recommended application for which it was designed.

05.02.00 Performance Certification

The MSFWS manufacturer shall submit to the Engineer of Record a “Manufacturer’s Performance Certificate” certifying the MSFWS is capable of achieving the specified removal efficiency for suspended solids, phosphorous and dissolved metals.

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

DCV, HCOC and City Detention design calculations
NRCS (SCS) TR-55 Runoff Equation and Runoff Curve Number Tables
RCFC Hydrology Manual Runoff Index Number Tables
Aerial Cover Photo
NOAA Precipitation Data

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Pennington Industrial — Job No: 74422
Site Design Vbmp & Qbmp and Water Quality HCOCV calculations — By: BCK
[for City Detention (10-yr 6- & 24-hr events) Volume calculations, see Drainage Report] — Date: 5/16/2019
Sheet: 1 of 1

Precipitation depth for 85th-Percentile 24-hr event per 85th Percentile Precipitation Map, Appendix 1.
HCOC 2-yr 24-hr mitigation (post - pre) volume analysis required. NRCS *TR-55* method is utilized below (*TR-55* approved per *SAR WQMP* (guidance), p. 68, 2012).
City also requires greater of 10-yr 6- or 24-hr event mitigation (post - pre) volume analysis. Same method used for Detention calculatoins; please see Drainage Report for detention calculations.
Precipitation depths from 2-yr 24-hr event per NOAA Precipitation Data Server at project site location, Appendix 7.
Existing site imperviousness is 0.00%. Existing site cover is Barren/graded per RCFC Hydro Mnl Plate D-5.5, and Falow/Bare per NRCS TR-55 Table 2-2c, Appendix 7.
Proposed site cover is Commercial per *RCFC Hydrology Manual* Plate D-5.6 and Commercial per *NRCS TR-55* Table 2-2a. See also Note 3 below.

Table of Site Design Vbmp & Qbmp, Water Quality HCOCV (2x24), and City Detention (10x6/10x24) Calcs to Determine Minimum Detention Volume for Proposed Site

Storm Event Precipitation Depths and Site Area Data with Vbmp and Qbmp Calculations												Water Quality HCOC Volume Calculations per NRCS *TR-55,* 1986						
Storm Event	Precip Depth (in)	(A) Area (sf)	Area (ac)	Perv-ious Area (sf)	Imperv-ious Area (sf)	Pervious Percent (%)	Imperv Percent (%)	Effective Imperv Fraction of Pervious Area per SAR WQMP, Table 2-1, p.22	(B) Design Vbmp per SAR WQMP, p.23 (cf)	(C) Qbmp per SAR WQMP p.23 (cfs)	(D) Design Qbmp per SAR WQMP Table 3-8, p.65 (cfs)	(E) Whole Site NRCS Hydro-logic Soil Group	(F) Whole Site Ex Cond. Runoff Index Curve No.	(G) Whole Site Prop Cond. Runoff Index Curve No.	(H) Whole Site Exist Cond. Storm Event Runoff Volume (cf)	(I) Whole Site Prop Cond. Storm Event Runoff Volume (cf)	(J) WQ Permit Release Limit 105% of Ex Runoff Volume (cf)	(K) Mitigation Volume [2x24 Vol = (I) - (J)] [10yr Vols = (I)-(H)] (cf)
Onsite 85th% 24-hr	0.69	190,025	4.36	23,430	166,595	12.3%	87.7%	0.10	8,693	0.694	0.625							
Offsite 85th% 24-hr	0.69	57,314	1.32	15,460	41,854	27.0%	73.0%	0.10	2,245	0.179	0.161							
Onsite 2-yr 24-hr	2.44	190,025	4.36									B	86	92	18,918	25,933	19,864	6,069
Offsite 2-yr 24-hr	2.44	57,314	1.32									B	86	92	5,706	7,822	5,991	1,831
		247,339	5.68	38,890	208,449	15.7%	84.3%								24,624	33,755	25,855	7,900

Notes on Table above:

1. For Vbmp & Qbmp calculation in columns (B) & (C), see also template-required spreadsheets, Appendix 6. For column (D), see Table E.2 of WQMP (Alt. Compliance, in-fill development).
2. (E) shows Hydrologic Soil Group (HSG) per NRCS Soils Report, Appendix 3.
3. (F) & (G) Runoff Index (Curve) Numbers are the more conservative of the two similar sets: 1) Plates D-5.5 & D-5.6 of *RCFC Hydro Mnl &* 2) Tables 2-2a & 2-2c of *TR-55,* pp. 2-5 & 2-6.
4. (H) & (I) show results for storm event existing and proposed runoff depth, Q, in inches (per Eq. 2-3 of *TR-55,* p. 2-1), multiplied by Site Area (A) to obtain site runoff volume.
5. (J) for the 2x24 event is per HCOC volume release limits described in Section 3.6, Hydromodification, *SAR WQMP* , pp. 68-69, and for the 10x events, per the post- minus pre- volumes.

Hydraulic Discharge Design Conditions

a) Site detention volume is controlled by the 10x24 event. See Drainage Report.
b) Per geotechnical engineering considerations identified in the WQMP, all infiltration and bioretention are infeasible, and no untreated or treated runoff is retained in native onsite soils.
c) Controlled release of site flows will be per the flow rate corresponding to the controlling design storm event, or the design Qbmp.
d) A BioClean modular wetlands device (City-approved) is proposed to receive the design Qbmp flow rate.
e) Storms generating flow rates in excess of the Qbmp will bypass the WQ device and discharge to the street gutter (both onsite and offsite).
f) Note the HCOC is cared for since the onsite volume retained is greater than even the sum of the onsite and offsite HCOC Volumes above.

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By: BCK
Date: 2-25-2019
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NRCS TR-55 method is utilized below (TR-55 approved per RC), attached.
City requires greater of 10-yr 6- or 24-hr event mitigation (post - pre) volume analysis.
Precipitation depths from 10-yr 6- & 24-hr events per NOAA at project site location, attached.
Existing site imperviousness is 0.00%. Existing site cover is Barren/graded per RCFC and Falow/Bare per TR-55.
Proposed site cover is Commercial per RCFC and Commercial per TR-55.
Hydrologic Soil Group (HSG) per NRCS Soils Report, attached.
Runoff Index (Curve) Nos. are most conservative of: 1) Plates D-5.5 & D-5.6 of *RCFC Hydro Mnl &* 2) Tables 2-2a & 2-2c of *TR-55,* pp. 2-5 & 2-6.
Runoff volume = runoff depth, Q, in inches (per Eq. 2-3 of *TR-55,* p. 2-1), multiplied by Site Area (A).
After precip stops, detention bay will fully drain via the onsite water quality modular wetlands device at Qbmp (~0.6 cfs max).

City Detention (10x6/10x24) Calcs to Determine Detention Volume for Site Property										
Storm Event	Precip Depth (in)	(A) Site Area (sf)	Site Area (ac)	(E) Whole Site NRCS Hydro-logic Soil Group	(F) Whole Site Ex Cond. Runoff Index Curve No.	(G) Whole Site Prop Cond. Runoff Index Curve No.	(H) Whole Site Exist Cond. Storm Event Runoff Volume (cf)	(I) Whole Site Prop Cond. Storm Event Runoff Volume (cf)	(K) Mitigation Volume [(I)-(H)] (cf)	(L) Detention Volume Required is Greatest of (K) (cf)
10-yr 6-hr	**1.95**	**208,639**	**4.79**	**B**	**86**	**92**	**14,106**	**20,731**	**6,624**	**10,153**
10-yr 24-hr	**4.22**	**208,639**	**4.79**	**B**	**86**	**92**	**47,750**	**57,903**	**10,153**	
100-yr 24-hr	6.69	208,639	4.79	B	86	92	88,117	99,954	11,837	(100-yr ref. only)

Chapter 2 Estimating Runoff

SCS runoff curve number method

The SCS Runoff Curve Number (CN) method is described in detail in NEH-4 (SCS 1985). The SCS runoff equation is

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S} \qquad \text{[eq. 2-1]}$$

where

Q = runoff (in)
P = rainfall (in)
S = potential maximum retention after runoff begins (in) and
I_a = initial abstraction (in)

Initial abstraction (I_a) is all losses before runoff begins. It includes water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration. I_a is highly variable but generally is correlated with soil and cover parameters. Through studies of many small agricultural watersheds, I_a was found to be approximated by the following empirical equation:

$$I_a = 0.2S \qquad \text{[eq. 2-2]}$$

By removing I_a as an independent parameter, this approximation allows use of a combination of S and P to produce a unique runoff amount. Substituting equation 2-2 into equation 2-1 gives:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} \qquad \text{[eq. 2-3]}$$

S is related to the soil and cover conditions of the watershed through the CN. CN has a range of 0 to 100, and S is related to CN by:

$$S = \frac{1000}{CN} - 10 \qquad \text{[eq. 2-4]}$$

Figure 2-1 and table 2-1 solve equations 2-3 and 2-4 for a range of CN's and rainfall.

Factors considered in determining runoff curve numbers

The major factors that determine CN are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition (ARC). Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected). Figure 2-2 is provided to aid in selecting the appropriate figure or table for determining curve numbers.

CN's in table 2-2 (*a* to *d*) represent average antecedent runoff condition for urban, cultivated agricultural, other agricultural, and arid and semiarid rangeland uses. Table 2-2 assumes impervious areas are directly connected. The following sections explain how to determine CN's and how to modify them for urban conditions.

Hydrologic soil groups

Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSG's (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. Appendix A defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report, which can be obtained from local SCS offices or soil and water conservation district offices.

Most urban areas are only partially covered by impervious surfaces: the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sands and gravels) than in watersheds predominantly of silts and clays, which generally have low infiltration rates.

Any disturbance of a soil profile can significantly change its infiltration characteristics. With urbanization, native soil profiles may be mixed or removed or fill material from other areas may be introduced. Therefore, a method based on soil texture is given in appendix A for determining the HSG classification for disturbed soils.

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent(2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.

2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.

3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

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IMPERVIOUS COVER FOR DEVELOPED AREAS

PLATE D-5.6


Pennington
Industrial
Google Earth
N
500 ft

NOAA Atlas 14, Volume 6, Version 2
Location name: Lake Elsinore, California, USA*
Latitude: 33.6833°, Longitude: -117.3344°
Elevation: 1277.2 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.081 (0.068-0.098)	0.110 (0.092-0.133)	0.149 (0.124-0.180)	0.182 (0.150-0.222)	0.228 (0.182-0.288)	0.264 (0.206-0.341)	0.302 (0.230-0.401)	0.342 (0.253-0.467)	0.398 (0.281-0.568)	0.443 (0.302-0.656)
10-min	0.116 (0.097-0.140)	0.158 (0.132-0.190)	0.214 (0.178-0.259)	0.261 (0.216-0.318)	0.326 (0.261-0.413)	0.378 (0.296-0.489)	0.433 (0.329-0.574)	0.490 (0.362-0.670)	0.570 (0.403-0.814)	0.634 (0.433-0.940)
15-min	0.141 (0.118-0.169)	0.191 (0.160-0.230)	0.258 (0.216-0.313)	0.315 (0.261-0.385)	0.395 (0.315-0.499)	0.458 (0.357-0.592)	0.523 (0.398-0.694)	0.593 (0.438-0.810)	0.690 (0.488-0.985)	0.767 (0.523-1.14)
30-min	0.217 (0.182-0.262)	0.295 (0.247-0.355)	0.399 (0.333-0.483)	0.487 (0.403-0.594)	0.609 (0.487-0.771)	0.707 (0.552-0.914)	0.808 (0.615-1.07)	0.915 (0.676-1.25)	1.07 (0.753-1.52)	1.19 (0.808-1.76)
60-min	0.349 (0.292-0.420)	0.473 (0.396-0.571)	0.641 (0.535-0.775)	0.781 (0.646-0.954)	0.978 (0.781-1.24)	1.13 (0.886-1.47)	1.30 (0.987-1.72)	1.47 (1.09-2.01)	1.71 (1.21-2.44)	1.90 (1.30-2.82)
2-hr	0.538 (0.451-0.648)	0.698 (0.585-0.843)	0.916 (0.765-1.11)	1.10 (0.910-1.34)	1.36 (1.09-1.72)	1.57 (1.22-2.02)	1.78 (1.36-2.36)	2.01 (1.49-2.75)	2.33 (1.65-3.33)	2.59 (1.77-3.84)
3-hr	0.672 (0.563-0.810)	0.865 (0.724-1.04)	1.13 (0.940-1.36)	1.35 (1.11-1.64)	1.65 (1.32-2.09)	1.90 (1.48-2.45)	2.15 (1.64-2.86)	2.42 (1.79-3.31)	2.80 (1.98-4.00)	3.10 (2.12-4.60)
6-hr	0.967 (0.811-1.17)	1.25 (1.05-1.51)	1.64 (1.37-1.98)	1.95 (1.62-2.38)	2.39 (1.91-3.02)	2.73 (2.13-3.53)	3.08 (2.35-4.09)	3.45 (2.55-4.72)	3.96 (2.80-5.66)	4.37 (2.98-6.47)
12-hr	1.25 (1.05-1.51)	1.72 (1.44-2.07)	2.31 (1.93-2.80)	2.79 (2.31-3.41)	3.43 (2.74-4.34)	3.91 (3.06-5.06)	4.40 (3.35-5.83)	4.88 (3.61-6.68)	5.53 (3.91-7.90)	6.03 (4.11-8.93)
24-hr	1.64 (1.45-1.90)	2.44 (2.16-2.82)	3.44 (3.03-3.98)	4.22 (3.69-4.93)	5.23 (4.42-6.30)	5.97 (4.95-7.34)	6.69 (5.42-8.43)	7.40 (5.84-9.58)	8.33 (6.31-11.2)	9.02 (6.61-12.6)
2-day	1.96 (1.73-2.26)	3.04 (2.68-3.51)	4.39 (3.86-5.08)	5.44 (4.75-6.35)	6.81 (5.76-8.21)	7.82 (6.48-9.62)	8.80 (7.13-11.1)	9.78 (7.71-12.7)	11.0 (8.37-14.9)	12.0 (8.79-16.7)
3-day	2.14 (1.89-2.47)	3.37 (2.98-3.89)	4.92 (4.33-5.70)	6.14 (5.37-7.18)	7.74 (6.55-9.34)	8.93 (7.41-11.0)	10.1 (8.18-12.7)	11.3 (8.88-14.6)	12.8 (9.69-17.2)	13.9 (10.2-19.4)
4-day	2.31 (2.04-2.67)	3.67 (3.24-4.24)	5.39 (4.75-6.25)	6.76 (5.91-7.89)	8.56 (7.25-10.3)	9.91 (8.22-12.2)	11.3 (9.12-14.2)	12.6 (9.93-16.3)	14.4 (10.9-19.4)	15.7 (11.5-21.9)
7-day	2.63 (2.33-3.04)	4.14 (3.66-4.79)	6.12 (5.39-7.09)	7.72 (6.75-9.02)	9.89 (8.37-11.9)	11.6 (9.58-14.2)	13.2 (10.7-16.7)	15.0 (11.8-19.4)	17.3 (13.1-23.3)	19.1 (14.0-26.6)
10-day	2.78 (2.46-3.21)	4.35 (3.84-5.02)	6.43 (5.66-7.45)	8.14 (7.12-9.51)	10.5 (8.90-12.7)	12.4 (10.3-15.2)	14.3 (11.6-18.0)	16.2 (12.8-21.0)	19.0 (14.4-25.6)	21.1 (15.5-29.4)
20-day	3.33 (2.95-3.85)	5.13 (4.53-5.92)	7.59 (6.68-8.79)	9.69 (8.47-11.3)	12.7 (10.7-15.3)	15.1 (12.5-18.6)	17.6 (14.3-22.2)	20.4 (16.1-26.4)	24.3 (18.4-32.7)	27.5 (20.1-38.2)
30-day	3.94 (3.49-4.55)	5.95 (5.26-6.88)	8.78 (7.73-10.2)	11.2 (9.81-13.1)	14.8 (12.5-17.8)	17.7 (14.7-21.8)	20.9 (16.9-26.3)	24.3 (19.2-31.4)	29.3 (22.2-39.4)	33.4 (24.5-46.5)
45-day	4.64 (4.10-5.36)	6.82 (6.02-7.88)	9.93 (8.74-11.5)	12.7 (11.1-14.8)	16.8 (14.2-20.2)	20.2 (16.7-24.8)	23.9 (19.4-30.1)	28.1 (22.1-36.3)	34.2 (25.9-46.1)	39.4 (28.9-54.8)
60-day	5.39 (4.76-6.22)	7.70 (6.80-8.90)	11.1 (9.74-12.8)	14.1 (12.3-16.4)	18.6 (15.7-22.4)	22.4 (18.6-27.6)	26.7 (21.6-33.6)	31.5 (24.8-40.7)	38.6 (29.2-52.0)	44.7 (32.8-62.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

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.**

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.**

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

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/

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**

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 sanitary 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.**

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.**

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
☒ 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**

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
☒ 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

Operations and Maintenance Plan

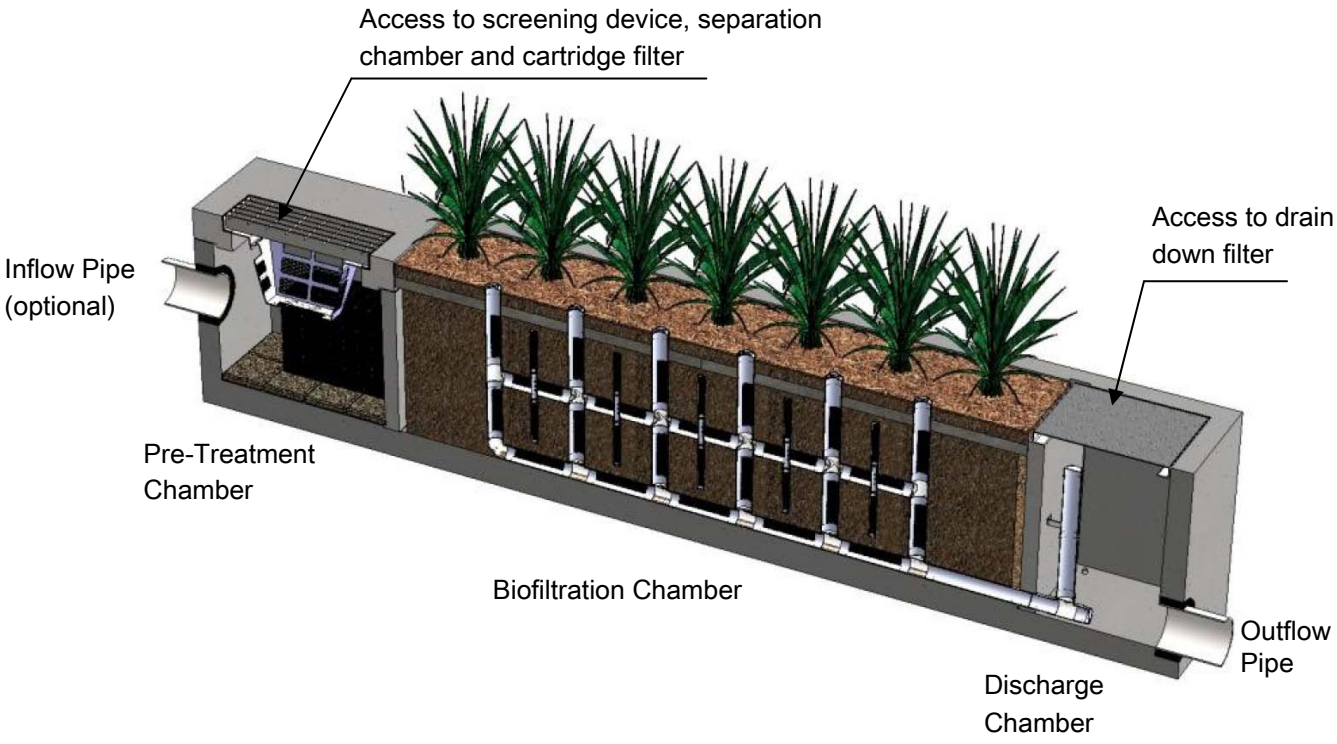
Reference – BMP	O&M Requirements	O&M Frequency
Onsite Storm Drain and Subsurface Detention System	• Sweep sidewalks and parking lots regularly to prevent accumulation of litter and debris.	Weekly
	• Use vacuum assisted sweeping for parking surfaces to remove sediments and smaller particulates to extend life of infiltration basin.	Monthly
	• Remove all foreign material (litter, debris, clippings, trimmings, etc.) from the landscaped area.	Weekly and with all landscape maintenance
	• Subsurface Detention Bay shall be cleaned and maintained per manufacturer's instructions herein. (to be included in F-WQMP)	Per manufacturer
Refuse Areas	• Maintain walled covered refuse area to prevent run-on – inspect and maintain annually and as needed. • Dumpster area shall be cleaned and inspected weekly to prevent accumulation of debris and decomposition. • Maintain clear and readable signage with the words, "Do not dump hazardous materials here" or similar – inspect and maintain annually and as needed.	Per requirements noted at left
Onsite Storm Drain Inlets	• Maintain legibility of words, "Only Rain Down the Storm Drain." Replace as necessary. Perform inspection and any needed maintenance annually. • Keep drain grates clean, clear, open and able to freely pass water – weekly and with all landscape maintenance activities.	Per requirements noted at left
Tenant Education	• Owner shall distribute to all new tenants the "What You Should Know for Landscape and Gardening" brochure in Appendix 9 and other materials summarizing resident responsibilities associated with not littering and not dumping hazardous materials in refuse, in accord with these O&M requirements. These materials shall be provided to each tenant upon first occupation.	Per requirements noted at left
Landscape	• Repair malfunctioning and leaking sprinkler system pipes and/or heads as needed with a minimum inspection and maintenance frequency of twice monthly. • All irrigation systems and their components shall be maintained at all times to operate efficiently per original design requirements. • Pesticides and fertilizers shall not be used normally for landscape maintenance. • Grass clippings and landscape trimmings shall be removed weekly.	Per requirements noted at left
Fire Sprinkler System	• Provide means to drain fire sprinkler test water to the sanitary sewer; never drain this water during periodic sprinkler system maintenance operations into the public storm drain system or into onsite infiltration BMPs.	Per requirements noted at left
Onsite Modular Wetlands System	• Refer to attached manufacturer's maintenance guidance.	Per manufacturer

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.

Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

Appendix 10: Educational Materials

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

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Maintenance Bays & Docks SD-31

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

Approach

In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code requirements.

Designing New Installations

Designs of maintenance bays should consider the following:

- Repair/maintenance bays and vehicle parts with fluids should be indoors; or designed to preclude urban run-on and runoff.
- Repair/maintenance floor areas should be paved with Portland cement concrete (or equivalent smooth impervious surface).

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- Repair/maintenance bays should be designed to capture all wash water leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters form entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

- Other features may be comparable and equally effective.

The following designs of loading/unloading dock areas should be considered:

- Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff.

- Direct connections into storm drains from depressed loading docks (truck wells) are prohibited.

- Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative. Pre-treatment may also be required.

- Other features may be comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

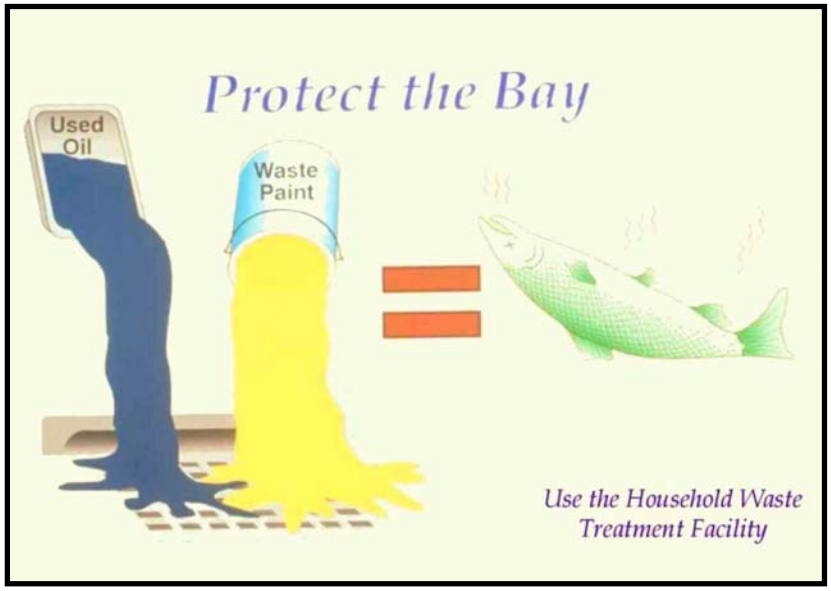
A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Non-Stormwater Discharges SC-10



Art Credit: Margie Winter

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

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Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:
  - Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - Landscaping and beautification efforts may also discourage illegal dumping.
  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:
  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

  - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes

  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)

- Responsible parties

Training

- Educate employees about spill prevention and cleanup.

- Well-trained employees can reduce human errors that lead to accidental releases or spills:

  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.

- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).

- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.

- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.

- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Vehicle and Equipment Cleaning SC-21

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

Pollution Prevention

- If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.

- Good housekeeping practices can minimize the risk of contamination from wash water discharges.

CASQA California Stormwater Quality Association

Suggested Protocols

General

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area.
- Provide trash container in wash area.
- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Emphasize the connection between the storm drain system and runoff, help reinforce that car washing activities affect local water quality through storm drain stenciling programs.

Vehicle and Equipment Cleaning

- Have all vehicle washing done in areas designed to collect and hold the wash and rinse water or effluent generated. Recycle, collect or treat wash water effluent prior to discharge to the sanitary sewer system.
- If washing/cleaning must occur on-site, consider washing vehicle equipment inside the building or on an impervious surface to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
  - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
  - Do not conduct oil changes and other engine maintenance in the designated washing area. Perform these activities in a place designated for oil change and maintenance activities.
  - Cover the wash area when not in use to prevent contact with rain water.
- Install sumps or drain lines to collect wash water for treatment.
- Use hoses with nozzles that automatically turn off when left unattended.
- Do not permit steam cleaning wash water to enter the storm drain.
- Pressure and steam clean off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as wellhead protection areas for public water supply.

Disposal

- Consider filtering and recycling wash water.
- Discharge equipment wash water to the sanitary sewer, a holding tank, or a process treatment system, regardless of the washing method used.
- Collect all wash water from vehicle cleaning operations and (1) discharge to a sanitary sewer, holding tank, or process treatment system or (2) run through an enclosed recycling system.
- Collect and treat wash water at the facility and either recycle or discharge to the sanitary sewer system or collect and dispose of as an industrial waste.
- Discharge wash water to sanitary sewer after contacting local sewer authority to find out if pretreatment is required.

Training

- Train employees on proper cleaning and wash water disposal procedures and conduct "refresher" courses on a regular basis.
- Train staff on proper maintenance measures for the wash area.
- Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

Spill Response and Prevention

- Keep the Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.

Other Considerations (Limitations and Regulations)

- Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.
- Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to steam cleaning.
- Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive. Also, for facilities that cannot recycle their wash water, the cost of pre-treating wash water through either structural practices or planning for

collection and hauling of contaminated water to sewage treatment plants can be cost-prohibitive.

Requirements

Costs

- Capital costs vary as follows depending on measures implemented:
  - Low cost ($2000-5,000) for berm construction
  - Medium cost ($10,000-30,000) for plumbing modifications (including re-routing discharge to sanitary sewer and installing simple sump)
  - High cost ($60,000-200,000) for on-site treatment and recycling
- O&M costs increase with increasing capital investment.

Maintenance

- Perform berm repair and patching.
- Sweep washing areas frequently to remove solid debris.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

Supplemental Information

Design Considerations

Designated Cleaning Areas

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
  - Paved with Portland cement concrete
  - Covered and bermed to prevent contact with stormwater and contain wash water
  - Sloped for wash water collections
  - Discharges wash water to the sanitary or recycle treatment process waste sewer, or to a dead-end sump
  - Equipped with an oil/water separator if necessary

Examples

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are applicable to industrial vehicle service facilities.

The U.S. Postal Service in West Sacramento has a new vehicle wash system that collects, filters, and recycles wash water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

Outdoor Loading/Unloading SC-30

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.

CASQA California Stormwater Quality Association

Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a deadend.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all and ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Have an emergency spill cleanup plan readily available.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.

Other Considerations (Limitations and Regulations)

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

Requirements

Costs

Costs should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Outdoor Equipment Operations SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal, are examples of process operations that can lead to contamination of stormwater runoff. Source controls for outdoor process equipment operations and maintenance include reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Approach

Pollution Prevention

- Perform the activity during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Suggested Protocols

- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer.
- Cover the work area with a permanent roof if possible.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention). If possible, connect process equipment area to public sewer or facility wastewater treatment system. Some municipalities require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- Dry clean the work area regularly.

Training

- Train employees to perform the activity during dry periods only or substituting benign materials for more toxic ones.
- Train employee and contractors in proper techniques for spill containment and cleanup. Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.

- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.
- Inspect storage areas regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.

Other Considerations

- Providing cover may be expensive.
- Space limitations may preclude enclosing some equipment.
- Storage sheds often must meet building and fire code requirements.

Requirements

Costs

Costs vary depending on the complexity of the operation and the amount of control necessary for stormwater pollution control.

Maintenance

- Conduct routine preventive maintenance, including checking process equipment for leaks.
- Clean the storm drain system regularly.

Supplemental Information

Further Detail of the BMP

Hydraulic/Treatment Modifications

If stormwater becomes polluted, it should be captured and treated. If you do not have your own process wastewater treatment system, consider discharging to the public sewer system. Use of the public sewer might be allowed under the following conditions:

- If the activity area is very small (less than a few hundred square feet), the local sewer authority may be willing to allow the area to remain uncovered with the drain connected to the public sewer.
- It may be possible under unusual circumstances to connect a much larger area to the public sewer, as long as the rate of stormwater discharges does not exceed the capacity of the wastewater treatment plant. The stormwater could be stored during the storm and then transferred to the public sewer when the normal flow is low, such as at night.

Industries that generate large volumes of process wastewater typically have their own treatment system and corresponding permit. These industries have the discretion to use their wastewater treatment system to treat stormwater within the constraints of their permit requirements for process treatment. It may also be possible for the industry to discharge the stormwater directly to an effluent outfall without treatment as long as the total loading of the discharged process

water and stormwater does not exceed the loading had a stormwater treatment device been used. This could be achieved by reducing the loading from the process wastewater treatment system. Check with your Regional Water Quality Control Board or local sewering agency, as this option would be subject to permit constraints and potentially regular monitoring.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net

Waste Handling & Disposal SC-34

Photo Credit: Geoff Brosseau

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Approach

Pollution Prevention

- Accomplish reduction in the amount of waste generated using the following source controls:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

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Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.

Run-on/Runoff Prevention

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.

- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff in pollution prevention measures and proper disposal methods.
- Train employees and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

Other Considerations (Limitations and Regulations)

Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

Capital and O&M costs for these programs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

Minimize runoff of polluted stormwater from land application by:

- Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, and there is a closed drainage system

- Avoiding application of waste to the site when it is raining or when the ground is saturated with water
- Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site
- Maintaining adequate barriers between the land application site and the receiving waters (planted strips are particularly good)
- Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins
- Performing routine maintenance to ensure the erosion control or site stabilization measures are working

Examples

The port of Long Beach has a state-of-the-art database for identifying potential pollutant sources, documenting facility management practices, and tracking pollutants.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Solid Waste Container Best Management Practices – Fact Sheet On-Line Resources – Environmental Health and Safety. Harvard University. 2002.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building Repair and Construction SC-42

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

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- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

SC-42 Building Repair and Construction

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

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The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).

- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:

  - Purchase and installation of signs.

  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.

  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.

  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

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King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

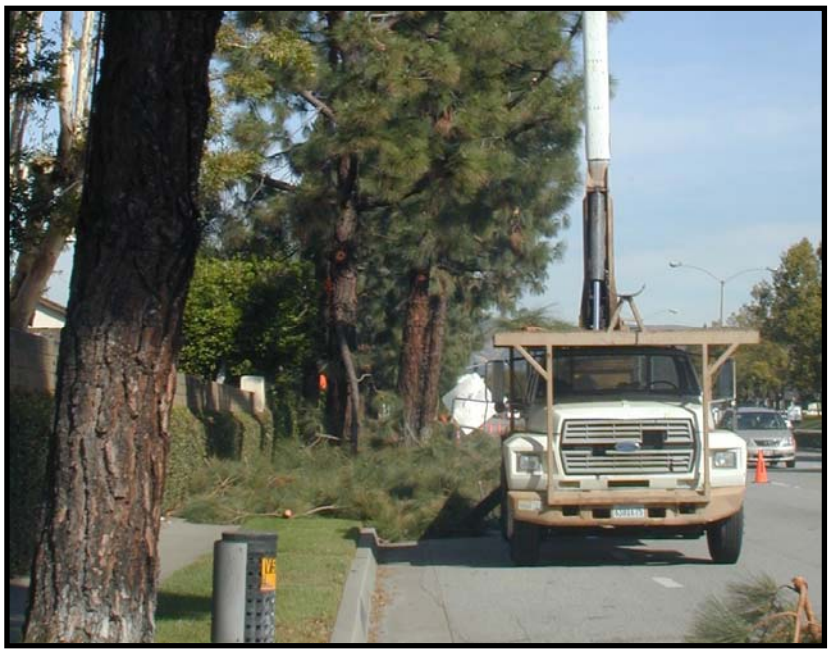
Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Landscape Maintenance SC-73



Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

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.

After the Storm

For more information contact:

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

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov
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A Citizen's Guide to Understanding Stormwater

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.

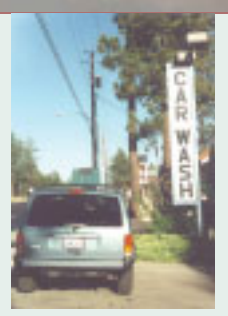
- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't 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.

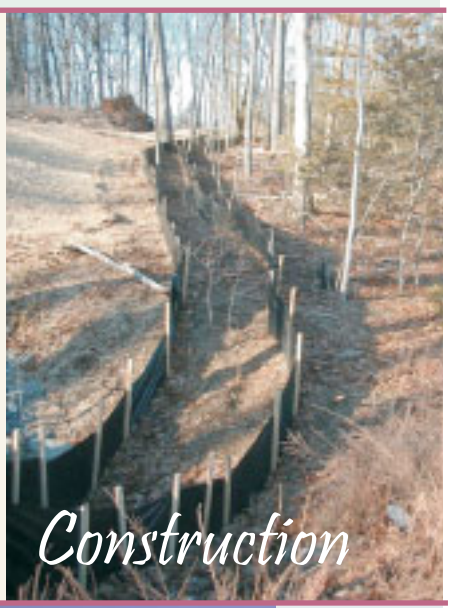
Commercial

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

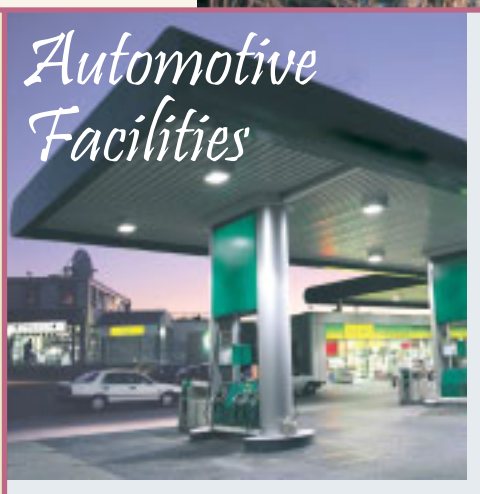
Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria,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

Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL
1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
  www.rcflood.org

Online resources include:

- California Storm Water Quality Association
  www.casqa.org
- State Water Resources Control Board
  www.waterboards.ca.gov
- Power Washers of North America
  www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers

Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

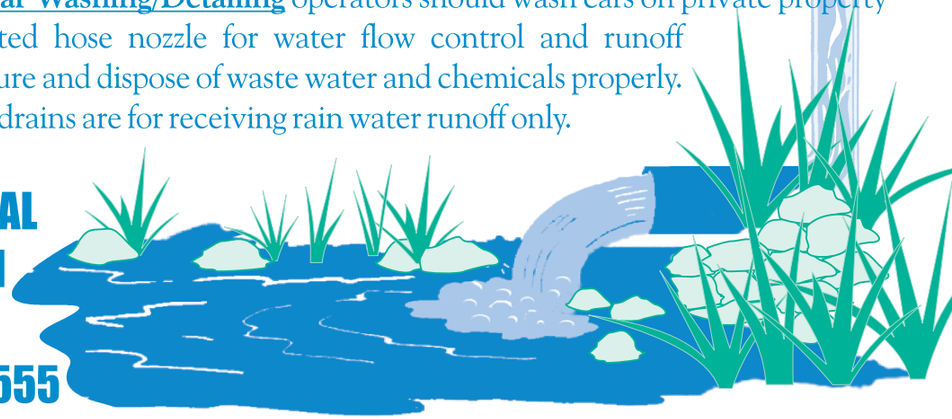
Do you know where street flows actually go?

Storm drains are NOT connected to sanitary sewer systems and treatment plants!

The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** *Always* have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

REPORT ILLEGAL STORM DRAIN DISPOSAL 1-800-506-2555



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is *PROHIBITED* by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. ***Each of us*** can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of ***small amounts*** of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.

Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.

When cleaning surfaces with a ***high-pressure washer*** or ***steam cleaner***, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks ***with loose paint***, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

The previous page is the last page of the P-WQMP, submittal 2, to be reviewed. The following pages are the reviewer's

redline comments

from the 1st submittal, along with

greenline responses.

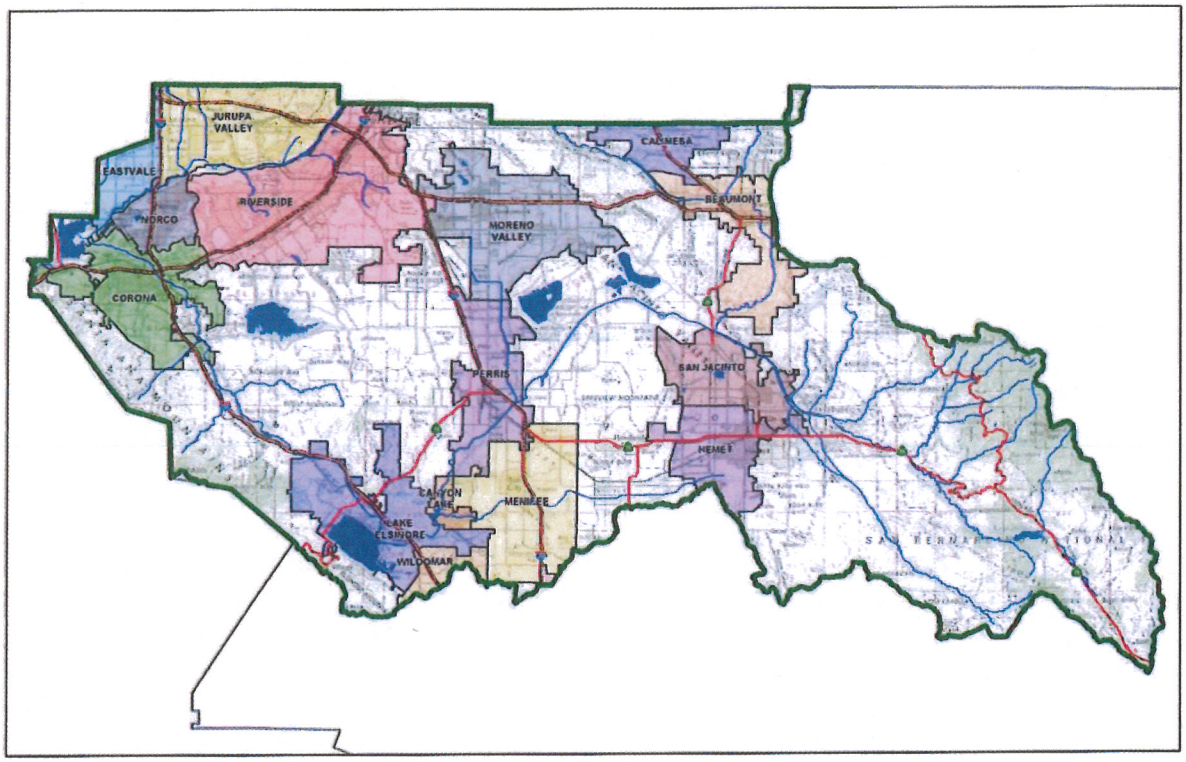
Project Specific Water Quality Management Plan

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

Project Title: **Pennington Industrial Park**

Development No: IDR-2019-00001 ✓

Design Review/Case No: PAR-2018-00006 ✓



☒ **Preliminary**
☐ **Final**

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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, 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	CAL 2014/2016 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Temescal Creek, Reach 6	None	MUN, GWR, REC1, REC2, WARM, WILD	None
Temescal Creek, Reach 5	n/a	MUN, AGR, GWR, REC1, REC2, WARM, WILD RARE	
Temescal Creek, Reach 4	n/a	MUN, AGR, GWR, REC1, REC2, WARM, WILD RARE	
Temescal Creek, Reach 3 (Lee Lake)	None	MUN, AGR, IND, GWR, REC1, REC2, WARM, WILD	
Temescal Creek, Reach 2	None	MUN, AGR, IND, GWR, REC1, REC2, WARM, WILD	
Temescal Creek, Reach 1A & 1B	n/a	MUN, REC2, WARM, WILD	
~~Prado Flood Control Basin~~ Santa Ana River, Reach 3	~~pH~~ Pathogens, Nitrate	MUN, REC1, REC2, WARM, WILD, RARE	

Indicator Bacteria

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 Grading Permit**	☒ 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.

Infiltration is not feasible due to seasonal high groundwater at 10 ft below ground surface, per the geotechnical engineering report, Appendix 3. Further, infiltration is not recommended due to very significant over-excavation requirements on the site (18-20 feet under pads) which will impact beyond the pad limits as well. ← followed by subsequent compaction

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

All impervious area is identified based on the proposed architectural requirements and design of the site. what about substituting pervious concrete or pavers in the parking stalls for a preventative (site Design) LID BMP?

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

Yes, to the maximum extent practicable, but not for all impervious surfaces. Factors mitigating against pervious area dispersion include: a) infiltration is not feasible (see above); b) site design and grading requirements, due in part to the in-fill nature of the site allow only limited areas, typically at the site perimeter, for some pervious area dispersion.

No infiltration (Appx. 5)

Bad soils: compaction (esp. close to bldgs & medium expansion potential

D.2 Harvest and Use Assessment

Is reclaimed water being piped to the site for irrigation?
NO

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: **0.81 acres**

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

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: **4.0 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: **1.266**

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: **5.04 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)
5.04 acres	**0.81 acres (NOT FEASIBLE)**

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
Storm Drain Inlets	Inlets shall be marked with words "Only Rain Down the Storm Drain" or similar wording.	• Wording shall be maintained or replaced per the O&M Schedule in Appendix 9. • See applicable operational BMPs in SC-44 in Appendix 10. The following shall be included 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 landscape plans shall accomplish the following: • Landscape shall be designed to minimize irrigation and runoff, promote surface infiltration where	• Maintain landscaping using ~~minimum~~ minimal pesticides. • See "What You Should Know for

	appropriate, and minimize use of fertilizers and pesticides that can contribute to stormwater. • Consideration given to use of pest-resistant plants especially adjacent to hardscape. • For successful establishment, plants shall be selected appropriate to site soils, slopes, climate, sun, rain, land use, ecological consistency, and plant interactions.	Landscape and Gardening" brochure in Appendix 10. • Provide Integrated Pest Management information to new owners, lessees, and operators.
Outdoor Refuse Areas and Litter/Trash & debris control	• Site refuse area shall be walled, covered, curbed and graded to prevent run-on. • Signs will be posted on or near dumpsters with the words, "Do not dump hazardous materials here" or similar wording.	• Maintain adequate number of receptacles and inspect 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 onsite. • See applicable operational BMPs in SC-34 in Appendix 10.
Sidewalks and Parking Lots sweeping		Vacuum → Sweep sidewalks and parking lot ~~regularly~~ to prevent accumulation of litter and debris. • Use vacuum assisted sweeping for pervious parking surface to maintain pore openings.
Loading Docks	• 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. • Though none are planned at present, water from any depressed loading dock areas shall be drained 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 Appendix 10.
Fire Sprinkler Test Water Roofing, Gutters and Trim	• Provide a means to drain fire sprinkler test water to the sanitary sewer. • Avoid roofing, gutters and trim made of copper or other unprotected metals that may leach into runoff.	See Fact Sheet SC-41 "Building and Grounds Maintenance" in Appendix 10.

What about Landscape maintenance frequency and sprinkler repair/adjustment

pollution.

Freq's. not req'd in this table. See Appx. 9 for freq's.

monthly

Loading docks are not depressed? – Clarify

Add: ~~Litter/Trash Control~~ Education of Owner/Tenants – No. This is not a Permanent Structural Source Control BMP (per Table definition, title). See Appx. 9 for this.

Appendix 9: O&M

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

Operations and Maintenance Plan

Reference – BMP	O&M Requirements	O&M Frequency
Onsite Storm Drain and Subsurface Detention System	• Sweep sidewalks and parking lots regularly to prevent accumulation of litter and debris.	Weekly
	• Use vacuum assisted sweeping for parking surfaces to remove sediments and smaller particulates to extend life of infiltration basin.	Monthly
	• Remove all foreign material (litter, debris, clippings, trimmings, etc.) from the landscaped area.	Weekly and with all landscape maintenance
	→ What this space is for - in Final LID&MP	
Refuse Areas	• Maintain walled covered refuse area to prevent run-on – inspect and maintain annually and as needed. • Dumpster area shall be cleaned and inspected weekly to prevent accumulation of debris and decomposition. • Maintain clear and readable signage with the words, "Do not dump hazardous materials here" or similar – inspect and maintain annually and as needed.	Per requirements noted at left
Onsite Storm Drain Inlets	• Maintain legibility of words, "Only Rain Down the Storm Drain." Replace as necessary. Perform inspection and any needed maintenance annually. • Keep drain grates clean, clear, open and able to freely pass water – weekly and with all landscape maintenance activities.	Per requirements noted at left
Tenant Education	• Owner shall distribute to all new tenants the "What You Should Know for Landscape and Gardening" brochure in Appendix 9 and other materials summarizing resident responsibilities associated with not littering and not dumping hazardous materials in refuse, in accord with these O&M requirements. These materials shall be provided to each tenant upon first occupation.	Per requirements noted at left
Landscape	• Repair malfunctioning and leaking sprinkler system pipes and/or heads as needed with a minimum inspection and maintenance frequency of twice monthly. • All irrigation systems and their components shall be maintained at all times to operate efficiently per original design requirements. • Pesticides and fertilizers shall not be used normally for landscape maintenance. • Grass clippings and landscape trimmings shall be removed weekly.	Per requirements noted at left
Fire Sprinkler System	• Provide means to drain fire sprinkler test water to the sanitary sewer; never drain this water during periodic sprinkler system maintenance operations into the public storm drain system or into onsite infiltration BMPs.	Per requirements noted at left
Onsite Modular Wetland System ✓	Refer to attached maintenance Guidelines brochure ✓	Monthly check of plant health + irrigation adequacy + 6-12 months for debris removal, etc. per mfg.

What about actual inspection/cleaning of detention pipes/on-site storm drain system?

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/

What about 1) Education of Owner/Tenants for BMPs & On-site Treatment BMP?
2) Site sweeping (monthly) to control litter/trash & sediment?
3) Regular Landscape maintenance to control vegetation
4) Irrigation System maintenance & adjustment/repairs?

? These items are not on this sheet, H. They are included on other sheets.

LID BMPs are infeasible because:

a) Infiltration BMPS (infiltration basins, infiltration trenches, drywells) are infeasible due to high seasonal groundwater elevations noted in the geotechnical report. The permit requires a 10-foot deep minimum soil column before treated stormwater reaches groundwater. Untreated stormwater should not be introduced into native onsite soils due to high groundwater potential on this site.

What about pervious pavement in parking stalls? → This is one LID BMP you could use.

From a water quality perspective and given the proposed site design, bioretention/biotreatment BMPs would best be located parallel to the building walls to maximize treatment flow. However, bioretention and/or biotreatment BMPs with/or without an underdrain, with or without liners, are not recommended for the following reasons:

NO! ? INFILTRATION!

b) The locations most beneficial for these BMPs will be over-excavated 18 to 20 feet involving removal and replacement of site soils with multiple compacted lifts per the geotechnical report. The use of bioretention in such conditions is infeasible due to the inability of such soils to infiltrate water.

c) Per the geotechnical report, site soils have significant clay content and medium expansion potential and therefore stormwater should not purposely be introduced into subgrade soils proximate to building foundations or other surface improvements. The expansion potential makes infeasible the use of typical bioretention/biotreatment BMPs.

↑ See revised.

WQMP REVIEW COMMENTS

The following is a summary of major comments and/or questions relative to this project-specific WQMP:

1. The project should have at least one Site Design LID BMP - Pervious Pavement in Parking Stalls.
2. Correct errors on Table A.1, p. 7.
3. See suggested edits on p. 9.
4. See Reclaimed Water question on p. 12
5. See suggested edits in Section G (Source Controls) p. 22 and p. 23.
6. See notes on BMP Site Map.
7. See notes on LID BMP Infeasibility (Appendix 5)
8. See notes on Appendix 9 (O&M)
9. Before Final WQMP is approved, provide Owner's Certification w/ signature & date and a recordable BMP Maintenance Agreement.

NO. See Appx. 5 - Infiltration is ill-advised anywhere on this site, meaning no infiltration.