



**ASH REMOVAL WORK PLAN
ADDENDUM #1**

**LILLARD PROPERTY
APN 042-120-10
24998 COUNTY ROAD 102, DAVIS CA**

March 24, 2017

A handwritten signature in blue ink that reads "Ercan Candan".

Ercan Candan
Project Engineer

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Eileen Fanelli
Project Manager

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1.0 INTRODUCTION

This document presents updates to the Work Plan dated December 21, 2016 (the 2016 Work Plan) for the removal of ash from the Lillard Ranch Property located on County Road 102 in the City of Davis, California (the Site) (Figure 1). The 2016 Work Plan described processes and procedures to be implemented by the Woodland Biomass Power, Ltd. (WBP) for removal and off-site disposal of an estimated 3,342 cubic yards of ash containing metal at concentrations that exceed either the Total Threshold Limit Concentration (TTLC) or the Soluble Threshold Limit Concentration (STLC) for specific metals. The 2016 Work Plan also presented the technical and operational plans and engineering designs to remove ash classified as California hazardous waste from the Site.

At the time the 2016 Work Plan was developed, WBP was completing laboratory analysis for dioxin and furan in ash samples and indicated that an addendum to the 2016 Work Plan would be prepared to address Decision Units where Dioxin/Furan concentrations exceeded criteria. The 2016 Work Plan also indicated it would be amended to address removal of ferrous metallic debris, such as nails, from ash remaining on the Site.

1.1 Objectives of Work Plan Addendum

This addendum outlines the work associated with management of ash containing Dioxins and Furans (Dioxin/Furan) at levels above the agricultural screening level of 0.0040 micrograms per kilogram (ug/kg) and the removal of ferrous metallic debris present in the ash at the Site. This addendum is to be used in conjunction with the 2016 Work Plan, attached updated grading plans, and technical specifications to implement the overall Site restoration activities.

1.2 Overview of Additional Work

The additional work includes excavating and temporary stockpiling of an estimated 3,444 cubic yards of ash containing Dioxin/Furan at concentrations above criteria. Metallic debris will be removed from the Dioxin/Furan containing ash using a magnet. The ash containing Dioxin/Furan will then be blended with native soils and re-used on the Site.

Following the excavation of the Decision Units containing Dioxin/Furan, the remaining Decision Units will be disked and a magnet will be utilized to remove ferrous metallic debris such as nails from ash that will remain on Site. The following provides an overview of the technical approach for the above mentioned restoration activities.

1.2.1 Characterization of Ash Containing Dioxins and Furans

As discussed in the 2016 Work Plan, WBP conducted extensive testing of the ash on Site in conformance with the approved Ash Characterization Work Plan dated June 30, 2016 and subsequent amendments. Decision Units, consisting of 50- by 50- foot grids were established throughout the Site and four samples (one from each 25- by 25- foot quadrants) were collected and composited from each Decision Unit for CAM 17 Metal analysis. For Dioxins and Furans, a

larger Decision Unit, consisting of 100- by 100- foot grids, was established and 16 samples (four from each 50- by 50- foot grids) were collected and composited for laboratory analysis.

Based on the results of the sampling and analysis, the ash in 13 of the 100- by 100-Decision Units were identified as having Dioxin/Furan concentrations in excess of criteria.

1.2.2 Ferrous Metallic Debris

Ferrous metallic debris such as nails were observed in the ash during sampling activities. The metallic debris found in the bed ash originates from the fuel that is used during the biomass-fired electric generating process.

1.2.3 Restoration

The construction activities associated with the management of Dioxin/Furan containing Decision Units and removal of metallic debris includes:

- Cutting or trimming vegetation to facilitate excavation and site grading.
- Preparing a separate designated stockpile location for ash containing Dioxin/Furan above criteria. Stockpile location will include installation of erosion control measures.
- Excavating an estimated 3,444 yards of ash containing Dioxin/Furan from 13 Decision Units.
- Removing metallic debris from the excavated ash containing Dioxin/Furan using magnets. Removal of metallic debris will occur either during stockpiling or during re-use of the ash as described below.
- Placing Dioxin/Furan containing ash in a 3-inch thick lift at the bottom of all excavated Decision Units (including 50- by 50- foot Decision Units where ash containing metal above criteria was excavated and 100- by 100- foot Decision Units where ash containing Dioxin/Furan above criteria was excavated), and blending the ash with underlying native soil by disking.
- Backfilling the rest of the excavated Decision Units with soil contained in the Hostetler Pile.
- Placing remaining ash containing Dioxin/Furan in a 3-inch thick lift over an approximately 5-acre area that does not contain ash and blending the ash with native soil by disking.
- Loosening ash in the non-excavated Decision Units throughout the site by plowing/disking to 10-inches and removing metallic debris from surface to 10-inch depth using a magnet.
- Where ash thickness is greater than 10 inches, completing an additional pass of the plow/disk to loosen the deeper ash and removing metallic debris below 10-inches using a magnet. The maximum depth of metallic debris removal is anticipated to be 20 to 24 inches.
- Wheel rolling and lightly compacting disturbed Decision Units throughout the site and placement of erosion control measures such as silt fence and/or waddles where appropriate.

It is WBP's understanding that the Site will be used for agricultural purposes following the completion of ash removal and management activities discussed herein. Based on the property owner's request, WBP will not hydroseed disturbed areas as described in the 2016 Work Plan. Subsequent erosion control will be the responsibility of the property owner following completion of the ash removal and management activities discussed herein. It is also WBP's understanding, based on conversations with the potential purchaser of the Site, Jeff Taylor that Mr. Taylor intends to plant pistachio trees shortly after completion of the 2016 Work Plan. Mr. Taylor indicated that he intends to plow/disk to loosen the soil/ash to a depth of approximately five (5) feet.

1.3 Work Plan Addendum Organization

The remainder of this addendum discusses the updates to Sections 2 through 5 and the Appendices A through C of the 2016 Work Plan as follows:

- Section 2: Design Basis – Provides additional detail on the design elements and technical approach to completing the work
- Section 3: Construction Activities – Describes the planned preconstruction and construction activities associated with restoration of the Decision Units
- Section 4: Project Reporting – Provides an overview of the documentation, reporting and scheduling activities to be performed
- Section 5: References – Documents cited in this Work Plan
- Appendix A: Revised Site Health and Safety Plan
- Appendix B: Revised Stormwater Pollution Prevention Plan (SWPPP)
- Appendix C: Revised Site Plans (Grading, Erosion & Sediment Control, and Traffic) with Technical Specifications

2.0 DESIGN BASIS

The design basis detailed in the 2016 Work Plan will also apply to the Dioxin/Furan containing ash restoration and metallic debris removal activities with the following additions.

2.1 Limits of Work

The attached Site Plan Map (Figure 2) depicts the entire footprint of ash and the grids used to establish the Decision Units throughout the site. The Decision Units containing ash exceeding the metal criteria to be excavated and transported offsite are highlighted with red and orange colors and the Decision Units with ash containing Dioxin/Furan to be excavated and re-used onsite are highlighted with blue color on the Site Plan Map.

2.2 Grading Approach

A total of thirty eight (38) Decision Units (25 Decision Units exceeding the metal criteria and 13 Decision Units exceeding the Dioxin/Furan criteria) will be excavated. As described in the 2016 Work Plan, the ash exceeding the metal criteria will be transported to an off-site disposal facility.

The ash exceeding the Dioxin/Furan criteria will be excavated and temporarily stockpiled. Metallic debris will be removed from the ash using a magnet. Approximately 1736 CY of the ash will be spread in a 3-inch thick layer at the bottom of the 38 excavated Decision Units and disked into the native soil. Soil from the Hostetler Pile will be placed above the 3-inch layer to match the pre-excavation surface elevation.

The remaining, approximately 1708 CY of ash containing Dioxin/Furan, will be spread in a 3-inch thickness over an approximately 4.5-acre area of native soil that does not contain ash. The ash will be disked into the native soils.

The remaining undisturbed Decision Units will be plowed/disked to loosen the ash. A magnet will be passed over the loosened ash to remove metallic debris. Where the ash thickness is greater than 10 inches, additional plowing/disking will occur in order to remove metallic debris from deeper depths. The maximum depth of plowing/disking is anticipated to be 24 inches.

2.3 Confirmation Soil Sampling

2.3.1 Decision Units Exceeding TTLC Criteria

As described in 2016 Work Plan, confirmation samples will be collected from five of the Decision Units excavated to remove ash containing metal above criteria. The confirmation samples will be analyzed for total copper. The results will be compared to the DTSC provided criteria of 240 milligrams per kilogram (mg/kg). If the results of the five confirmation samples are at or below the 240 mg/kg criteria, it will be assumed that copper in the overlying ash did not leach to native soils, and confirmation sampling will cease.

2.3.2 Decision Units Exceeding Dioxin/Furan Criteria

Confirmation sampling will not be performed for the Dioxin/Furan containing Decision Unit excavations. Instead, a pilot study will be performed by excavating one Dioxin/Furan Decision Unit, stockpiling the ash, taking approximately 23 yard subsample from the stockpile, spreading the subsample over a 50 by 50-foot area of non-ash containing soils in a 3 inch lift, disking it into the native soil, and collecting four samples from each 25 by 25-foot quadrant of the grid. The samples will be sent to the laboratory to be composited and tested for Dioxin/Furan.

If the analytical result indicates the Dioxin/Furan is below the criteria, then the process will be deemed effective and will be implemented across the site. If the analytical result is above the agricultural screening level, then additional blending with the native soil and/or soil from the Hostetler pile, will be conducted and an additional round of sampling conducted.

In order to document removal of the metallic debris, a visual field check will be performed as the Site is being disked and metallic debris is being removed by using a magnet. The types and general quantity of metal removed will be noted in field logs. Additionally, weight tickets for metal disposed of off-site will be included in the final documentation of the removal work.

3.0 CONSTRUCTION ACTIVITIES

The construction activities detailed in the 2016 Work Plan apply to the management of ash containing Dioxin/Furan and the metallic debris removal activities.

The project plans including Health & Safety Plan (Appendix A), Stormwater Pollution Prevention Plan (Appendix B), and Grading, Erosion, and Traffic Control Plan (Appendix C) have been updated to include management of Dioxin/Furan containing ash and metallic debris removal activities.

4.0 PROJECT DOCUMENTATION AND REPORTING

At the completion of construction, TRC will prepare a final construction completion report (CCR), which will incorporate the following CQA components.

- Daily inspection forms.
- Photographic log which include daily photographs from all stages of the implementation of the 2016 Work Plan.
- As-built reports.
- Deviations from the grading plans and specifications if any, with documentation justifying approved changes.
- Summary of the volume of ash containing metal removed and disposed of off-site.
- Summary of the volume of ash containing Dioxin/Furan removed and reused.
- Summary of the volume of metallic debris removed.

The CCR will be signed by a professional Engineer and contain a statement that the removal and restoration was implemented in general conformance with the drawings and specifications, the 2016 Work Plan and this addendum. The final CCR will be provided to the DA and DTSC.

5.0 REFERENCES

TRC Solutions, Inc. (2016) *Ash Removal Work Plan, Lillard Property*. Prepared for Woodland Biomass Power, Ltd. December 21.

TRC Solutions, Inc. (2016) *Proposal for Ash Characterization, Lillard Ranch Site*. Prepared for Woodland Biomass Power, Ltd. June 30.

TRC Solutions, Inc. (In Preparation) *Ash Characterization, Lillard Ranch Site, Davis, CA*



ASH REMOVAL WORK PLAN

**LILLARD PROPERTY
APN 042-120-10
24998 COUNTY ROAD 102, DAVIS CA**

December 21, 2016

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FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan Map

Figure 3 – Organization Chart

APPENDIX

Appendix A: Health and Safety Plan

Appendix B: Storm Water Pollution Prevention Plan

Appendix C: Site Plans Grading, Erosion & Sediment Control, and Traffic) with Technical Specifications

1.0 INTRODUCTION

This document presents the Work Plan for the removal of ash at the Lillard Ranch Property located on County Road 102 in the City of Davis, California¹. The Work Plan describes processes and procedures to be implemented by the Woodland Biomass Plant (WBP) for remediation of select areas of ash (Decision Units) generated by the biomass-fired electric generating facility owned by WBP and deposited at the Lillard Ranch (Site) during the time period of 2011 through 2013. The remediation activities are overseen by the Yolo County District Attorney's office (DA) and California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). This Work Plan was prepared by TRC Solution, Inc. (TRC), on behalf of WBP.

1.1 Objectives

The objectives of this Work Plan are to present the technical and operational plans and engineering designs to remove subject Decision Units (defined in Section 1.2.2) containing ash classified as hazardous waste, from the Site. This Work Plan is to be used in conjunction with the attached grading plans and technical specifications to implement the ash removal activities.

1.2 Overview of Work

The work includes removal of an estimated 3,342 cubic yards of ash containing metal at concentrations that exceed either the Total Threshold Limit Concentration (TTLC) or the Soluble Threshold Limit Concentration (STLC) for specific metals. The ash will be transported and disposed of at an off-site, licensed, waste management facility. The Site will be graded and substantially restored to pre-excavation conditions. The following provides an overview of the technical approach for removal of the Subject Decision Units that exceed the applicable metal concentrations. As characterization of the ash has not yet been completed for all chemicals of potential concern, specifically Dioxin/Furan analyzes, it is anticipated that this plan will be amended in the future to address Decision Units where Dioxin/Furan concentrations exceed established criteria as further described below.

1.2.1 Site Location and Description

The Lillard Ranch Site is located along County Road 102 in an agricultural area of Davis, CA (Figure 1). The Site topography is generally flat. A mixture of bottom and fly ash generated from the Woodland Biomass Plant located on Kentucky Avenue in Woodland was placed at the ground surface across several acres of the Site. The ash ranges in thickness from less than 3-inches to about 2-feet. The surface of the ash is generally firm. The edges of the ash are generally less compacted, and reflective of the properties of the underlying soil. Site vegetation consists primarily of weeds and low-lying shrubs. Much of the ground surface is unvegetated.

¹ According to Stephanie Cormier, Senior Planner, Yolo County Department of Community Services, property is within the City of Davis, and the permitting agency is Yolo Country.

1.2.2 Ash Characterization

In summer and fall 2016, WBP conducted extensive testing of the ash in conformance with the approved Ash Characterization Work Plan dated June 30, 2016 and subsequent amendments. The results of the Ash Characterization are documented in a report titled *Ash Characterization, Lillard Ranch Site, Davis, CA* (in preparation).

The area of ash was delineated during a site reconnaissance and surveyed by CalVada Surveying, Inc. The surveyors laid out a 50- by 50-foot grid on the Lillard Ranch that included 711 grids that are referred to as Decision Units, including a stockpile of soil mixed with ash known as the Hostetler pile, which contained 21 underlying Decision Units. TRC collected samples from the Decision Units and from the soil containing ash comprising the Hostetler Pile between July 27 and October 5, 2016. Additionally, TRC collected samples from 21 Decision Units where the ash is less than 3-inches thick and/or not everywhere present (thin and patchy areas). Sampling of the thin and patchy areas [is scheduled to] occurred on December 13, 14, and 15, 2016.

WBP retained TestAmerica to perform laboratory analysis of the ash samples collected from each Decision Unit. WBP agreed to use laboratory analysis to characterize the ash in each Decision Unit and to remove the ash in any Decision Unit that contains ash with the following characteristics (each a “Subject Decision Unit”):

- Total metal concentration exceeding the respective TTLC value
- Soluble metal concentration exceeding the respective STLC value
- Dioxin/Furan exceeding agricultural screening level of 0.040 ug/kg

Based on the results of the sampling and analysis, the ash in 25 Decision Units was identified as having metal, primarily copper and lead, concentrations in excess of the applicable TTLC or STLC value. WBP will remove ash in these Decision Units and transport the ash to Waste Management’s Kettleman Hills facility for disposal as California Hazardous Waste.

Dioxin and Furan analyzers are in process. This plan will therefore be amended in the future to address Decision Units where Dioxin/Furan concentrations exceed criteria. This plan will also be amended to address the removal of non-ferrous scrap metal.

1.2.3 Removal

As agreed to with the DA and DTSC, the subject Decision Units will be removed from the Site. The construction activities associated with the removal include:

- Preparing excavation, stockpile, and access roads by cutting or trimming of the Site vegetation, if present.
- Preparing designated stockpile location by installing 10-mil plastic barrier and erosion control measures.
- Excavation of an estimated 3,342 yards of ash.
- Stockpiling excavated ash on 10-mil plastic barrier.
- Loading and transport of stockpiled ash to the Kettleman Hills disposal facility.

- Grading and backfilling excavated Decision Units with non-hazardous ash and soil contained in the Hostetler Pile.
- Placement of final erosion control measures including hydroseeding areas where vegetation existed prior to site disturbance.

The construction activities will be conducted to avoid creation of dust and potential for sediment transport from the Site. Traffic controls will be implemented as required by the County.

Administrative activities associated with the removal include:

- Establishment of erosion, dust, and site control measures and
- Project documentation, including construction quality assurance (CQA).

1.3 Work Plan Organization

The remainder of this Work Plan is organized as follows:

- Section 2: Design Basis – Provides details on the design elements and technical approach to completing the work.
- Section 3: Construction Activities – Describes the planned preconstruction and construction activities associated with removal of the Subject Decision Units.
- Section 4: Project Reporting – Provides of an overview of the documentation, reporting and scheduling activities to be performed.
- Section 5: References – Documents cited in this Work Plan
- Appendix A: Site Health and Safety Plan
- Appendix B: Stormwater Pollution Prevention Plan (SWPPP)
- Appendix C: Site Plans (Grading, Erosion & Sediment Control, and Traffic) with Technical Specifications

2.0 DESIGN BASIS

2.1 Limits of Work

The project Site is shown in Figure 2. Subject Decision Units to be removed are highlighted. The units will be marked in the field by the TRC construction oversight staff prior to excavation work, using the survey controls established as part of the ash characterization work. The site work will be laid out to limit equipment movement across areas of ash and non-ash.

2.2 Grading Approach

WBP will contract with a licensed hazardous waste remediation contractor. The subject Decision Units will be selectively excavated to remove ash overlaying the original ground surface. Excavation will continue until the CQA officer visually confirms removal of ash to bare soil. The excavation will also remove exposed metallic debris, such as nails, observed at the ash/soil interface. Because the original ground surface was uneven at the time of ash placement, it is anticipated several inches of the underlying soil will be removed with the overlying ash, resulting in an over-excavation of subject Decision Unit.

The excavated ash will be stockpiled prior to loading into trucks for transport to Waste Management's Kettleman Hills disposal facility. Following ash removal, the site will be graded to reflect conditions prior to excavation. Non-hazardous soil and ash from the existing Hostetler Pile will be used as fill material. Any excess soil in the Hostetler Pile will be spread or otherwise graded to a stable configuration per the preference of the property owner. Graded areas will be compacted to minimize potential erosion following ash removal.

2.3 Confirmation Soil Sampling

Soil confirmation soil sampling is typically used to test whether overlying waste has been sufficiently removed. Confirmation samples are analyzed for the chemicals of concern in the overlying waste. The analytic results are compared to established background concentrations. In the case of Lillard Ranch, the chemical quality of soil underlying the ash was not characterized prior to ash placement. Additionally, metals in the ash would not tend to leach under ambient conditions, making it difficult to compare the confirmation soil with the ash characterization results.

As a conservative measure, to confirm if visual methods are effective in documenting ash removal, confirmation sampling will initially be conducted in five Decision Units with ash characterized as having the highest total and/or soluble copper concentrations. Decision Unit 24Z had ash that exceeded the TTLC and STLC criteria for copper. Decision Units 17T and 15DD had the highest total copper. Finally Decision Units 8H and 28HH had ash with the highest soluble copper concentrations.

The confirmation results will be compared to the TTLC criteria used to evaluate the overlying ash. If the soil is confirmed non-hazardous, then the excavation will cease and the area will be

backfilled as described below. If the soil is hazardous, an additional 6-inches of soil will be removed, and a second confirmation soil sample collected. This process will continue until soil classified as hazardous is removed. Confirmation data will be provided to the DA and DTSC for review and concurrence that criteria are met prior to being backfilled. Confirmation samples will be collected following the same protocol as was used during the Ash Characterization work. Four samples will be collected from each 25-foot quadrant of the 50-foot square Decision Unit. The samples will be submitted to TestAmerica where they will be composited and analyzed for total copper.

If the initial five confirmation samples confirm that the underlying site soils are non-hazardous, it will be assumed that metals in the overlying ash did not leach or otherwise migrate at significant concentrations and confirmation sampling will cease. The project CQA officer will rely on visual documentation of ash removal for remaining Decision Units.

2.4 Material Management

Ash classified as non-RCRA, California hazardous waste will be transported under manifest signed by WBP staff to Waste Management's Kettleman Hills facility. Waste profiles will be established using the data for the subject Decision Units. Based on conversations with Waste Management staff, two waste profiles are anticipated: one for subject Decision Units containing ash with elevated soluble copper requiring stabilization before disposal, and one for ash excavated from the remaining subject Decision Units.

Excavation will be conducted in a manner to minimize the potential for spreading ash from subject Decision Units to other areas of the site. Hazardous ash excavated from subject Decision Units will be immediately loaded onto a small truck(s) that will transport the ash to the stockpile area. Equipment excavating and transporting ash to the stockpile area will be limited to operating on the area of ash, to avoid tracking ash to areas of non-ash at the Site. The stockpile area will be demarcated using orange construction fencing. During periods of non-work, such as weekends, the pile will be tarped and signage hazardous waste will be placed adjacent to the pile.

Ash will be periodically hauled, during construction, from the stockpile area to the disposal facility. We anticipate stockpiling approximately 500 yards of ash at any one time prior to transport. Trucks hauling ash will enter the site and traverse non-ash containing portions of the Site to the stockpile location. A loader will be used to place the stockpiled ash into the trucks. The trucks will then pull away from the stockpile area, tarp their load, and exit the site for the Kettleman Hills facility.

Best management practices (BMPs) for control of potential stormwater runoff and dust control will be implemented during construction. In addition, post-ash removal grading will be completed to return the site to substantially the same condition it was prior to the work. Surfaces will be compacted or otherwise left in a stable condition to minimize the potential for erosion.

3.0 CONSTRUCTION ACTIVITIES

3.1 Pre-Construction Activities

3.1.1 Procurement

WBP will request bids from qualified, licensed contractors using the grading plans and technical specifications included as Attachment C to this Work Plan. A copy of the contractor's license will be requested as part of the pre-construction submittals. WBP will notify the DA and DTSC when the grading contractor has been selected and provide copies of the contractors' license and qualifications to perform the work.

WBP will provide overall project management of the work. TRC will provide field oversight and construction quality assurance (CQA) as the project engineer.

3.1.2 Health & Safety

A site specific Health & Safety Plan (HASP) has been prepared and is included as Attachment A. The HASP covers staff providing oversight, WBP representatives, and any observers from the DA or DTSC offices. WBP will require the contractor to prepare and implement a HASP as part of the project pre-construction submittals. The contractor HASP will conform to the general requirements of Federal and State Occupational Safety and Health Administration standards for hazardous waste operations. The contractor will be responsible for job-site safety issues as required by the general industry safety orders and all laws and regulations including training and medical monitoring of personnel. Certification that contractor staff are properly trained will be required as a pre-construction submittal. A copy of the contractors HASP will be available at the work site at all times.

3.1.3 Construction Oversight

3.1.4 Construction Quality Assurance

The organization and reporting of personnel performing ash removal work activities is summarized below and illustrated on figure 3.

DA – Mr. David Irely is the primary contact with the DA's office. The DA will attend the project kick-off meeting, and make periodic visits to the Site.

DTSC – Mr. Dylan Clark is the primary contact with the DTSC. DTSC will attend the project kick-off meeting, and make periodic visits to the Site.

WBP – Mr. Robert Sanch will serve as the WBP Program Manager. All communications with the DA and DTSC will go through Mr. Sanch.

WBP Project Manager - Mr. George Nowland will serve as the ash removal project manager and field construction manager for WBP.

TRC – Mr. Ercan Candan will serve as the project engineer and CQA officer and will attend the mandatory kick-off meeting with the Yolo County Public Works representatives and project team. He or his designee, will observed ash removal, collect confirmation samples, and observe backfilling operations. Ercan is supported by Eileen Fanelli, TRC project manager, and primary contact with WBP.

The following CQA activities will be implement as part of the project. The CQA program is designed to assure removal of ash classifying as hazardous from the subject Decision Units and is implemented per the requirements of the California Code of Regulations Title22, Section 66264.19.

The CQA officer will:

- Be a licensed professional engineer in the State of California.
- Be familiar with the contractor's work schedule and work phasing, review pre-construction contractor submittals, and observe construction and documentation of the contractor's compliance or non-compliance with the drawings and technical specifications.
- Attend construction meetings, specifically the pre-construction kick-off meeting and project status meetings, as appropriate, provide guidance to the contractor on the execution of the work, and respond to contractor requests for information (RFIs).
- Monitor site work and accept or reject work based on monitoring information.
- Work with field oversight staff to ensure that daily reports document site activities in sufficient detail to complete a final ash removal report and CQA documentation.

3.1.5 Traffic Management

The traffic controls are detailed on drawing 7 of Attachment C. In general, once mobilized to the site, the Contractor's equipment will remain on site for the duration of the work. The contractor's personal vehicles will be parked on-site but outside of the general construction area. On days when ash is loaded and hauled to the Kettleman Hills facility, trucks will enter the site from County Road 102, and once loaded and tarped, exit the site north bound on County Road 102. The contractor will provide temporary barricades, flag persons and other means to safely control traffic flow and minimize disruption to traffic along primary or secondary haul routes.

3.1.6 Stormwater Management

A SWPPP is included as Attachment B to this Work Plan. WBP will file a notice of intent (NOI) for coverage under California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (General Permit) Order No. 2012-006-DWQ. The SWPPP will be uploaded to the States SMARTS web site and a paper copy will be available on site at all times during construction. The SWPPP will be updated as necessary during construction in response to monitoring data and observations and inspections following rain

events. The contractor will implement BMPs as outlined in the SWPPP and required in the Technical Specifications included on drawing 6 of Attachment C.

3.1.7 Dust Control

Construction activities will involve equipment and vehicles traveling over dirt and ash surfaces, in addition to ash and soil removal and handling. These activities may generate dust in the form of particulate matter (PM). To mitigate fugitive emissions of PM, the contractor will implement standard BMPs including watering site surfaces prior to and during excavation, using reduced rates of speed (below 5 miles per hour) for vehicle traffic on unpaved surfaces, placing plastic sheeting below stockpiles, covering stockpiles that are not in use for greater than 24 hours, and street sweeping the entrance and exit to the site, as outlined in the technical specifications on drawings 2 and 6 of Attachment C.

3.1.8 Approvals

Prior to construction, WBP will seek DA and DTSC approval of the Ash Removal Work Plan. In addition, WBP will obtain the necessary grading permit and plan approvals from the Yolo County Department of Public Works. WBP will file the NOI and upload the SWPPP to the State Water Board SMARTS website.

3.2 Construction Activities

3.2.1 Temporary facilities, exclusion zones, and site security

The conceptual site layout for temporary facilities is shown on drawing 3 of Appendix C. The contractor will mobilize equipment to the site for the duration of the work or as long as that piece of equipment is needed. All equipment will be staged within the Site boundary. If necessary, the Contractor may install temporary equipment storage units within the areas shown on drawing 3. The contractor will mobilize, maintain and regularly service temporary sanitary facilities sufficient for the project crew, including WBP, TRC and the DA/DTSC. The contractor will be responsible for providing all temporary power, water, and communications required for the work.

Contractor, TRC, WBP, and DA/DTSC personal vehicles will be parked on site, in areas where ash classified as hazardous is not present.

3.2.2 Decontamination

All equipment will be decontaminated prior to leaving the Site. Excess soil and dirt remaining on the excavation and trucking equipment will be removed with brushes. The material will be collected and disposed of with stockpiled ash. Debris and solid waste will be collected, bagged and properly disposed of as required in the technical specifications included in Attachment 3.

3.2.3 Final Site Grading and Stabilization

Grading plans are shown on drawings 4 and 5 included in Attachment C. Depths of excavation will vary across the site but will generally be between 3-inches to 2-feet. The CQA Officer will document removal of ash and associated metal debris in subject Decision Units to the total depths indicated. Following confirmation sampling or at the direction of the CQA Officer, the excavation areas will be backfilled.

Excavation areas will be backfilled using non-hazardous soil and ash comprising the Hostetler Pile. Soil and ash will be placed in 6-in lifts and compacted by tracking. Backfilling will continue until the former excavation area reaches original ground surface. Final erosion controls will be placed as specified on drawing 6 of Attachment C.

3.2.4 Demobilization

WBP will notify the DA/DTSC of the pending completion of work. Prior to demobilizing from the site, the DA and DTSC with representatives of WBP, will conduct a site walk to confirm site conditions prior to demobilization. A list of outstanding concerns will be developed. WBP will address these items (punch list) prior to releasing the contractor.

The contractor will remove all trash and other excess material, and all equipment from the site. The contractor will install any post-construction erosion control measures, remove any temporary facilities, decontamination equipment such as rumble strips, and repair any objects, including roadways damaged by the contractor's work activities.

4.0 PROJECT DOCUMENTATION AND REPORTING

At the completion of construction, a final construction completion report (CCR) will be prepared. The CCR will incorporate CQA components, including:

- Daily inspection forms.
- Photographic logs.
- As-built reports.
- Deviations from the grading plans and specifications if any, with documentation justifying approved changes.
- Summary of the volume of ash removed.

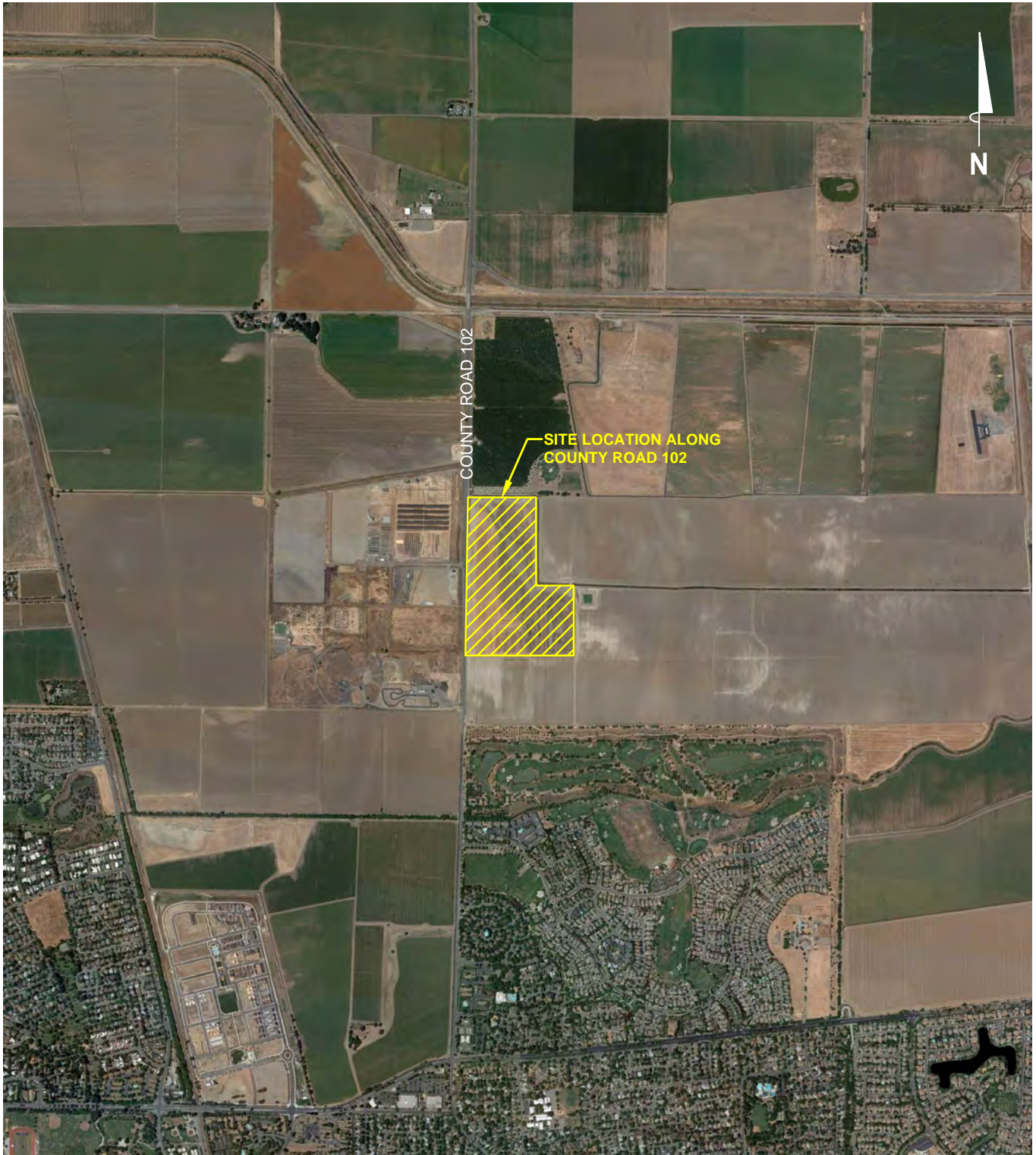
The CCR will be signed by a professional Engineer and contain a statement that the removal was implemented in general conformance with the drawings and specifications, and this Work Plan. The final CCR will be provided to the DA and DTSC.

5.0 REFERENCES

TRC Solutions, Inc. (2016) *Proposal for Ash Characterization, Lillard Ranch Site*. Prepared for Woodland Biomass Power, Ltd. June 30.

TRC Solutions, Inc. (In Preparation) *Ash Characterization, Lillard Ranch Site, Davis, CA*

8.5x11P -- ATTACHED XREFS: -- ATTACHED IMAGES: Lillard_Aerial2016.dwg
DRAWING NAME: L:\Graphics\Projects\byName\Lillard_Ranch_LM.dwg --- PLOT DATE: December 13, 2016 - 9:11AM --- LAYOUT: 8.5x11P



SOURCE AERIAL PHOTO: Google Earth Professional, July 2016.

SCALE (FEET)



9685 Research Drive
Irvine, CA 92618
Phone: 949.727.9336
www.trcsolutions.com

PROJECT:

**LILLARD RANCH
COUNTY ROAD 102
DAVIS, CALIFORNIA**

TITLE:

**SITE LOCATION MAP
ASH REMOVAL WORK PLAN**

DRAWN BY:

RMC

CHECKED BY:

EF

APPROVED BY:

EF

DATE:

12/13/2016

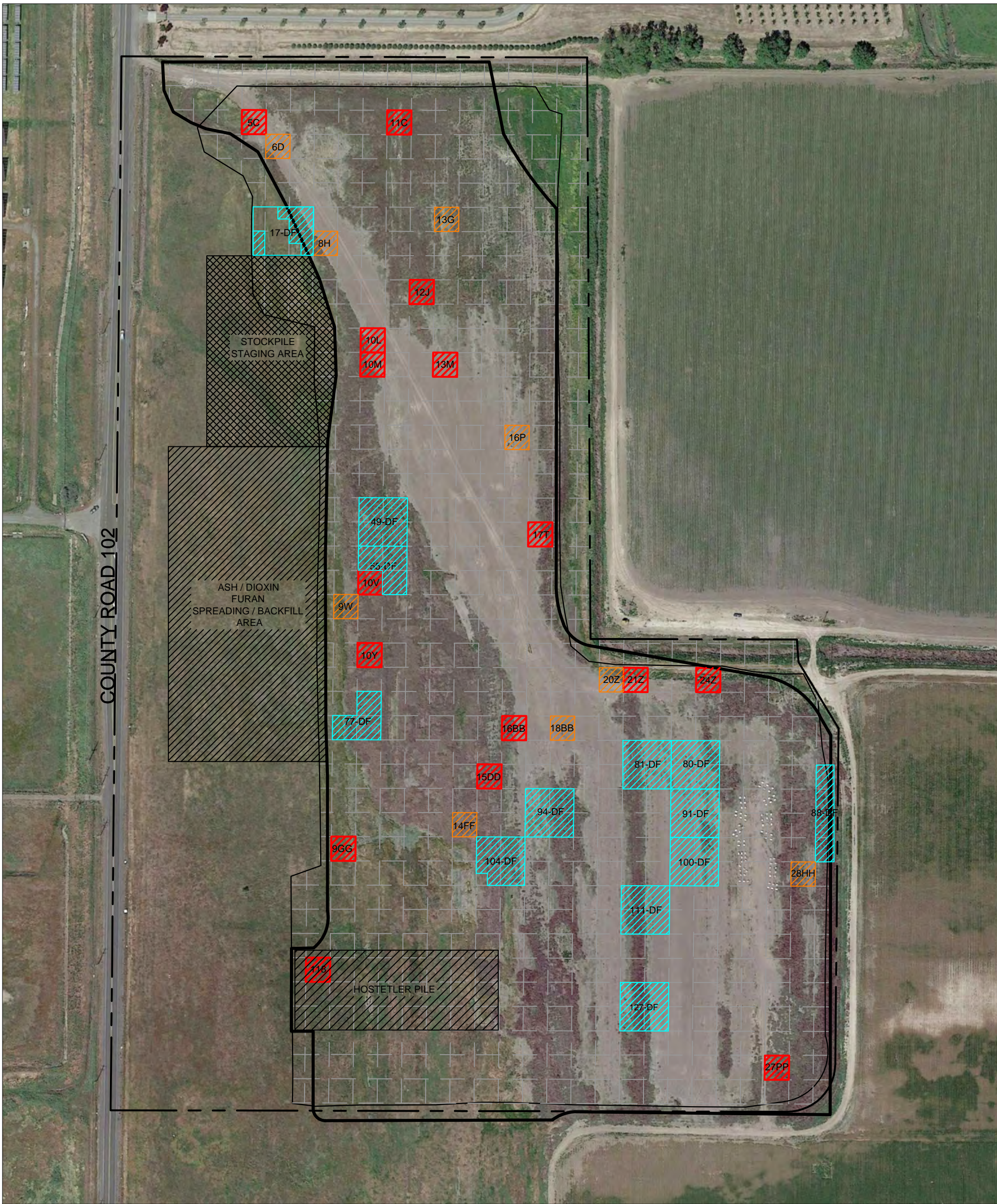
PROJ. NO.:

254981.0000.0000

FILE:

Lillard_Ranch_LM.dwg

FIGURE 1



SOURCE AERIAL PHOTO: Google Earth Professional, April 2015.

LEGEND:

--- APPROXIMATE SITE BOUNDARY

--- APPROXIMATE EXTENT OF ASH

--- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS

50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH

50' x 50' DECISION UNITS, EXCEEDING THE METAL CRITERIA, TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

50' x 50' DECISION UNITS, EXCEEDING THE METAL CRITERIA AND REQUIRING TREATMENT / STABILIZATION, TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

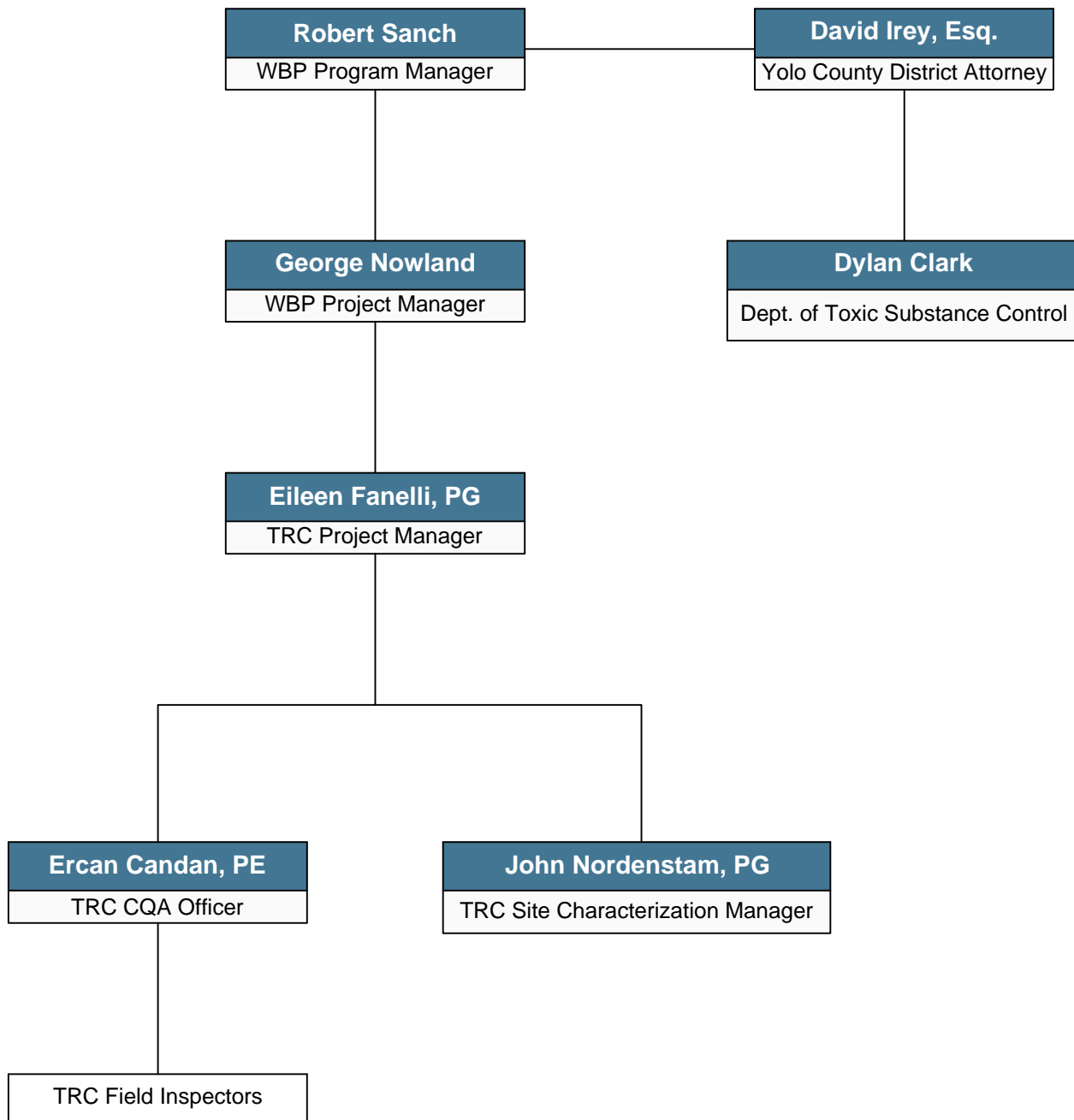
DIOXIN / FURAN DECISION UNITS, WITH TEQs GREATER THAN 40, TO BE EXCAVATED, STOCKPILED AND REUSED ONSITE BY BLENDING IT WITH UNDERLYING NATIVE SOIL BY DISKING

SCALE (FEET)



PROJECT:		LILLARD RANCH COUNTY ROAD 102 DAVIS, CALIFORNIA	
TITLE:		SITE PLAN	
DRAWN BY:	WC	PROJ NO.:	0000.0000.0000
CHECKED BY:	EC	FIGURE 2	
APPROVED BY:	EC		
DATE:	02/23/2017		
		9685 Research Drive Irvine, CA 92618 Phone: 949.727.9336 www.trcsolutions.com	
FILE NO.:		Grading Plan.dwg	

8.5x11 - ATTACHED XREFS: -- ATTACHED IMAGES: L:\Graphics\Projects\byName\Lillard Ranch\254981.0000.0000\Lillard_Ranch_OrgChart.dwg -- PLOT DATE: December 13, 2016 - 10:01AM -- LAYOUT: 8.5x11P



PROJECT:

**LILLARD RANCH
COUNTY ROAD 102
DAVIS, CALIFORNIA**

TITLE:

**ORGANIZATION CHART
ASH REMOVAL WORK PLAN**

DRAWN BY:

RMC

CHECKED BY:

EF

APPROVED BY:

EF

DATE:

12/13/2016

PROJ. NO.:

254981.0000.0000

FILE:

Lillard_Ranch_OrgChart.dwg

FIGURE 3

APPENDIX A
HEALTH AND SAFETY PLAN



**SITE SPECIFIC
HEALTH & SAFETY PLAN**
(REVISED MARCH 2017)

WOODLAND BIOMASS POWER, LTD.
Lillard Ranch Site
County Road 102
Davis, CA

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

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- C EMERGENCY SERVICES
- D LOCAL AREA MAP
- E JOB SAFETY ANALYSIS (JSAs)
- F PRE-JOB SAFETY BRIEFING
- G WORKCARE PROGRAM INFORMATION
- H INCIDENT NOTIFICATION, AUTO INCIDENT, AND SAFE CATCH REPORTS
- I HEALTH AND SAFETY MANAGEMENT SYSTEM COMPLIANCE PROGRAMS:
CP011 HEAT STRESS PREVENTION PROGRAM, CP012 COLD STRESS PROGRAM AND
CP024 EXCAVATION AND TRENCH PROGRAM

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP)

Lillard Ranch Site

County Road 102

Davis, CA

1.0 INTRODUCTION

The purpose of this Health & Safety Plan (HASP) is to establish responsibilities, procedures and contingencies for the protection of TRC employees, contractors, visitors and the public while performing activities at the Lillard Ranch site. This site-specific HASP is to be implemented in conjunction with TRC Companies Inc., (TRC) Health and Safety Management System (HSMS) and the Injury and Illness Prevention Program (IIPP).

The use of proper health and safety procedures in accordance with applicable OSHA regulations shall be required during site work. The procedures presented in this HASP are intended to serve as guidelines. They are not a substitute for sound judgment by site personnel.

1.1 Key Companies Involved In Project

CUSTOMER OR CLIENT:	Woodland Biomass Power, Ltd.
CONTRACTOR:	TRC
SUBCONTRACTOR:	N/A

1.2 Scope of Work

The proposed work will be performed by TRC and will include, but may not be limited to, the oversight of the removal of the ash applied to surface at the Lillard Ranch Site located in Davis, California (Site). Work activities will include as follows:

- Cutting or trimming vegetation to facilitate excavation and site grading.
- Preparing designated stockpile location by installing 10-mil plastic barrier and erosion control measures.
- Excavation of an estimated 3,342 yards of ash containing metal above criteria from 25 Decision Units. Excavations with depths varying across the site but will generally be between 6-inches to 2-feet.
- Stockpiling excavated ash on 10-mil plastic barrier. Loading and transport of stockpiled ash to the CleanHarbors disposal facility located in Buttonwillow, California.
- Excavation of an estimated 3,444 yards of ash exceeding the Dioxin/Furan criteria from 13 Decision Units. Removal metallic debris from the excavated ash containing Dioxin/Furan

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Lillard Ranch

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using magnets. Removal of metallic debris will occur either during stockpiling or during re-use of the ash as described below.

- Placing Dioxin/Furan containing ash in a 3-inch thick lift at the bottom of all excavated Decision Units (including 50- by 50- foot Decision Units where ash containing metal above criteria was excavated and 100- by 100- foot Decision Units where ash containing Dioxin/Furan above criteria was excavated), and blending the ash with underlying native soil by disking.
- Backfilling the rest of the excavated Decision Units with soil contained in the Hostetler Pile until the former excavation area reaches original ground surface.
- Placing remaining ash containing Dioxin/Furan in a 3-inch thick lift over an approximately 5-acre area that does not contain ash and blending the ash with native soil by disking.
- Loosening ash in the non-excavated Decision Units throughout the site by plowing/disking to 10-inches and removing metallic debris from surface to 10-inch depth using a magnet.
- Where ash thickness is greater than 10 inches, completing an additional pass of the plow/disk to loosen the deeper ash and removing metallic debris below 10-inches using a magnet. The maximum depth of metallic debris removal is anticipated to be 20 to 24 inches.
- Wheel rolling and lightly compacting disturbed Decision Units throughout the site and placement of erosion control measures such as silt fence and/or waddles where appropriate.

Site Specific Health & Safety Plan (HASP)

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2.0 SITE INFORMATION

This HASP considers the physical, chemical, and biological hazards that may be encountered during work activities at the site. Operations associated with this HASP will be conducted in accordance with the scope of work and approved design drawings/specifications.

Summary information for this project is provided in the following table:

Table 1: Site Information

Anticipated Work Period:	2017
Site description	See Attachment A for site map
Contaminants of concern (see Attachment B):	Crystalline Silica, Total Particulates, Metals (arsenic, barium, beryllium, cobalt, lead, manganese), Dioxin/Furan and pH.

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Lillard Ranch

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3.0 ROLES & RESPONSIBILITIES

Contact information and names of key project personnel are listed below. A description of their responsibilities follows.

Table 2: Key Project Personnel and Contact Information

Role	Name	Contact Information
TRC Personnel		
TRC Project Manager/Supervisor	Ercan Candan	(805) 260-9257 - cell
TRC Site Safety Officer (SSO)	TBD	
TRC Assistant Site Safety Officer (Assistant SSO)	TBD	
Customer/Client Contact	George Nowland	(916) 801-0050 - cell
Customer/Client Contact	Rob Sanch (Environmental Supervisor)	(734) 834-4117 – cell (734) 302-5383 - office
Contractor/Subcontractor Personnel		<input checked="" type="checkbox"/> NA
<input type="checkbox"/> Contractor / <input type="checkbox"/> Subcontractor Company Name: NA		
Site Safety Officer (SSO)	NA	NA
Assistant Site Safety Officer (SSO)	NA	NA

TRC Site Safety Officer or Assistant Safety Officer must report all site incidents immediately to the TRC Project Manager or their Supervisor

TRC PM/Supervisor must report all incidents/ significant near misses within 24 hours to:		
TRC ECR Safety Manager	Dave Sullivan	(978) 656-3565 – office (978) 758-2809 – cell
TRC National Safety Director	Mike Glenn	(949) 727-7347 – office (949) 697-7418 – cell

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

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3.1 TRC Project Manager/Supervisor

- Overall responsibility for development of a complete and accurate HASP. The HASP shall account for all foreseeable hazards.
- Responsible for the management and technical direction of all aspects of the project.
- Ensure the completion of periodic site inspections.
- Conduct incident investigations.
- Delegate responsibility for field implementation of the HASP to TRC Site Safety Officer.

3.2 Site Safety Officers (SSO) – TRC & Contractor Personnel

- Responsible for the daily implementation of the HASP.
- Ensures HASP is available onsite and that the plan is understood and signed by all personnel entering the site. (See **Attachment F** “Pre-job Safety Briefing”).
- Conducts (or coordinates the completion of) Tailgate Safety Meetings and ensures documentation of these meeting is available for review.
- Uses JSAs to emphasize hazards and protective measures discussed in the HASP.
- Communicates any revisions to the scope of work or HASP to affected personnel and Project Manager/Supervisor.
- Implements emergency response procedures.

3.3 Assistant Site Safety Officer (Asst SSO) – TRC & Contractor Personnel

- In the event the SSO is not on site, the Assistant SSO will assume the responsibilities of the SSO.
- It is TRC’s intent to have a TRC SSO or Assistant SSO available onsite during work activities. On the occasion neither person are physically onsite, they will be available by phone or pager. See “Table 2: Key Project Personnel and Contact Information”.

3.4 TRC Employees

- Responsible for understanding and complying with this HASP, including the JSAs.
- Are required to participate in Tailgate Safety Meetings prior to commencement of site work.
- Must acknowledge an understanding of the HASP by signing the “Pre-job Safety Briefing” (See **Attachment F**).

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3.5 Contractors & Subcontractors

A copy of the HASP will be made available to each designated Contractor/Subcontractor (from now on to be referred to “Contractors”) Site Health and Safety Officer (SSO) prior to coming to the site. Upon review or briefing of the HASP, each contractor and their personnel working at the site will be required to sign the “Safety Compliance Agreement” (See Appendix F) to verify their understanding and willingness to comply with the HASP.

TRC hires Contractors to apply their technical expertise to specific work tasks (i.e. construction, drilling, grading and heavy equipment operation/maintenance). Although TRC has a certain level of knowledge in these areas, the contractor is most knowledgeable of the hazards within their particular area of expertise and is in the best position to implement and monitor an effective H&S program. Contractors are required to follow and operate within their company’s health and safety program and policies. TRC will exercise reasonable care to prevent and detect safety violations on the site. However, direct supervision of contractor employee safety is the responsibility of the contractor.

Contractors are to designate a company representative as their own Site Safety Officer and, if applicable, Assistant Safety Officer. This individual shall monitor the contractor’s employees and ensure that safe working procedures are being followed. The Site Safety Officer and, if applicable, Assistant Safety Officer shall be identified to the TRC in writing, either by email, letter or by having the individual sign and provide contact information on “Pre-job Safety Briefing” (See **Attachment F**).

Contractors are to:

- Provide a copy of their HASP to the TRC SSO or Project Manager/Supervisor before work commences.
- Provide safety equipment and personal protective equipment for their employees.
- Ensure their equipment is in proper working order and their employees are trained and medically fit to complete the work assigned to them.
- Upon request, provide evidence that personnel working at the site have received the necessary training, certifications and, if applicable, medical surveillance.

The Contractor must inform the TRC SSO if the risks associated with a particular task exceed day-to-day safety requirements and necessitate additional safety precautions to protect the employees performing the particular task. In such cases, TRC may dictate that additional safety precautions be implemented. In the event a discrepancy arises between contractor safety procedures and those of TRC, the more stringent is to be implemented.

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3.6 Visitors / Regulatory Agents

- Visitors / regulatory agents will be provided an overview of the basic site safety information. A copy of this HASP will be made available for review.
- All visitors / regulatory agents are required to sign-in on “Pre-job Safety Briefing” (See **Attachment F**) each time they enter the project site.
- Visitors / regulatory agents should be escorted by a TRC or designated contractor employee and should not be allowed to move about the site alone.

4.0 COMMUNICATION

Communication is an important aspect of project safety and this HASP. There are several processes incorporated in this HASP to ensure communication of health and safety hazards.

- Pre-job Project Planning meetings to discuss the scope of work, potential hazards, and Client/TRC Specific Health and Safety Programs (i.e., TRC Glove and Fixed Open Blade Knife policies).
- Site walkdowns with the TRC workgroup, subcontractors and the customer/client.
- Development of site-specific HASP and JSAs.
- Communication and acknowledgement of understanding of HASP & JSAs by signing the “Pre-job Safety Briefing” (See **Attachment F**).
- Tailgate meetings emphasizing that hazard assessment is a continuous process, and any potentially unsafe actions or condition are to be communicated immediately to the SSO.
- Communicating results of field observations/audits. Visual observations are to be conducted daily by the SSO. Periodic field observations will also be recorded on the TRC Safety Observation Form (TRC HSMS, CP015 Behavior Based Safety Program). Results from either observation will be communicated during Tailgate Safety Meetings.

5.0 REVISIONS TO HASP

If a situation arises where the HASP requires revision, the following option are available:

- Except in the case of emergency situations, no deviations from the HASP may be implemented without the prior notification and approval of the TRC Site Safety Officer (SSO).
- If HASP revisions are minor (i.e. not involving significant changes to the scope of work, associated hazards or PPE requirements), the TRC Site Safety Officer (SSO) can make hand-written revisions to the HASP in the field. HASP Revisions must then be communicated to affected personnel and the Project Manager/Supervisor.

Site Specific Health & Safety Plan (HASP)

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- If HASP revisions are substantial (i.e. involving significant changes to the scope of work, associated hazards or PPE requirements), the TRC Site Safety Officer (SSO) must consult with the Project Manager/Supervisor before making revisions. The TRC Site Safety Officer (SSO) can make hand-written revisions to the HASP in the field. HASP Revisions must then be communicated to affected personnel and the Project Manager/Supervisor. It is up to the discretion of the Project Manager/Supervisor whether a revised HASP will be reissued to replace the original HASP on the work site.

6.0 HAZARD ASSESSMENT

Hazard assessment is essential for establishing hazard prevention measures. Below is a list of potential physical, chemical and biological hazards associated with various TRC project sites. Not all hazards apply to this site-specific HASP. In addition, the list is not all-inclusive and may require additional hazards associated with a particular project/site to be added.

Please check, or add applicable hazards or hazardous tasks, hazards associated with the scope of work described in this HASP (Section 1.2). A JSA shall be developed to address each of the indicated hazards or hazardous tasks. JSAs are included in **Attachment E** of this HASP.

6.1 Physical Hazards

- ☐ Excavation & Trenching (where personnel will be entering the excavation)
- ☒ Heavy Equipment (not drilling related)
- ☐ Drilling
- ☒ Overhead lines
- ☒ Underground utilities
- ☐ Energy Control – Lock out / Tag out
- ☐ Flammable Atmospheres (> 10% LEL)
- ☒ Traffic - vehicular and pedestrian
- ☒ Trips, Slips & Falls
- ☒ Head, foot, eye, and back injuries
- ☒ Falling objects
- ☐ Working from elevated surface (> 6ft); Fall Protection / Fall Arrest
- ☐ Ladders Use
- ☒ Sharp objects
- ☒ Fatigue (See **Attachment I** for CP021 Fatigue Management Program)

Equipment

- ☐ Electrical equipment (including powered hand tools)
- ☒ Hydraulic equipment
- ☐ Pneumatic equipment

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Non-Powered Hand Tool

- ☐ Cutting equipment
- ☐ Welding hazards
- ☐ Confined Spaces

6.2 Chemical Hazards

SDS are to be included with the HASP whenever a hazardous material (not waste) is stored or utilized at the work site. SDSs can be found in **Attachment B** after the Occupational Health Guidelines and Toxicological Information Table.

- ☐ Refined Petroleum products / waste oil
- ☐ Asbestos
- ☐ Serpentine Soils
- ☐ PCE, TCE
- ☐ Ozone
- ☐ Hydrogen Sulfide
- ☐ Landfill Gases
- ☒ Environmental samples, soil cuttings, decontamination water, dust (Total Particulates, Metals, Dioxin/Furan)

6.3 Biological Hazards

- ☒ Noise Exposure
- ☒ Heat Stress
- ☒ Cold Stress (see JSA and **Attachment I** CP012 Cold Stress Program)
- ☒ Weather - heat, cold, rain, fog
- ☐ Poisonous Plants
- ☒ Animals/Insects
- ☐ Misc Pathogens

7.0 GENERAL SAFETY RULES

This section presents general safety rules for all persons working at the project site. Failure to follow safety protocols and/or continued negligence of health and safety policies will result in expulsion of a worker or firm from the site and may result in termination of employment.

1. Horseplay, fighting, gambling or the possession of firearms are not permitted.
2. Work shall be well planned and supervised to prevent injuries. Supervisors shall assure that employees observe and obey safety rules and regulations.
3. An employee reporting for work who, in the opinion of his supervisor, is unable to perform his assigned duties in a safe and reasonable manner shall not be allowed on the job.

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4. No employee shall be assigned a task without first having been instructed on proper methods, including safety training, of carrying out the task. Any employee who feels they have not received proper instruction shall notify their supervisor prior to carrying out the task.
5. Injuries and accidents shall be reported immediately to the immediate supervisor, who will then report it to the SSO.
6. There shall be no consumption of food or drink in operational areas of the site. Hands should be thoroughly cleansed prior to eating.
7. Smoking is not permitted on the site.
8. When personnel are conducting hazardous operations, there shall be at least one other person (buddy system) on duty in the immediate area as a backup in case of emergency.
9. Wear required personal protective equipment (PPE) in the workplace when appropriate and/or when specified in the site specific health & safety plan. Loose clothing and jewelry should not be worn when operating machinery.
10. Do not operate any machinery if you are not authorized or qualified to do so. If unsure how to operate a machine or perform any assigned task, ask the Project Manager/Supervisor before proceeding.
11. Do not operate motorized equipment until proper training and certification has been provided (e.g. forklifts, etc.)
12. No one shall knowingly be permitted or required to work while the employee's ability or alertness is so impaired by fatigue, illness or other causes that it might unnecessarily expose the employee or others to injury.
13. Alcohol and drugs are strictly prohibited on any TRC premises, customer property, and/or in Company vehicles. Employees shall not report to work under the influence of drugs or alcohol. Employees are prohibited from possessing, using, manufacturing, distributing, dispensing, selling or purchasing illegal drugs or other controlled substances (as defined under federal and state law).

8.0 PERSONAL PROTECTIVE EQUIPMENT

TRC and Contractor personnel are required to wear PPE appropriate for the task and potential physical, chemical and biological exposures. Selection of PPE is based on hazard assessment (i.e. JSAs) and air monitoring.

8.1 PPE Required by All Personnel at All Times on the work site

- ☒ Hard Hat
- ☒ Safety Shoes/Boots
- ☒ Safety Vest
- ☒ Eye Protection - ☒ glasses ☐ goggles ☒ face shield*
- ☐ Hand Protection - ☐ Kevlar ☒ nitrile ☐ other _____
- ☒ Hearing Protection
- ☐ Respiratory Protection - ☒ APR Particulate** ☐ APR Chemical cartridge ☐ other _____

Site Specific Health & Safety Plan (HASP)

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County Road 102, Davis, CA

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☐ Protective Clothing - ☒ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____

* Will be required only if site workers are handling ash without mechanized equipment or entering active work area on foot. Equipment operators will be in enclosed cabins while operating equipment and no site worker will be within active work zone during active excavation, loading, plowing/disking, and backfilling work. Site workers will inspect work areas after all equipment are de-energized and dust control measures are implemented.

** Until personal air monitoring indicate that airborne concentrations are below AL and PEL, APR particulate and tyvex shall be utilized by the crew.

8.2 PPE which should be available at all times on the work site

☐ Hard Hat
☐ Safety Shoes/Boots
☐ Safety Vest
☐ Eye Protection - ☐ glasses ☐ goggles ☐ face shield
☒ Hand Protection - ☒ Kevlar ☒ nitrile ☐ other _____
☒ Hearing Protection
☒ Respiratory Protection - ☒ APR Particulate ☐ APR Chemical cartridge ☐ other _____
☒ Protective Clothing - ☒ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____

8.3 PPE Required by a Specific Task

Task: Excavation Oversight (Inside Exclusion Zone and During Air Monitoring)

☒ Hard Hat
☒ Safety Shoes/Boots
☒ Safety Vest
☒ Eye Protection - ☒ glasses ☐ goggles ☒ face shield*
☒ Hand Protection - ☐ Kevlar ☒ nitrile ☐ other _____
☒ Hearing Protection
☒ Respiratory Protection - ☒ APR Particulate** ☐ APR Chemical cartridge ☐ other _____
☒ Protective Clothing - ☒ Tyvex ☐ Nomex ☐ Coveralls ☐ other _____

* Will be required only if site workers are handling ash without mechanized equipment or entering active work area on foot. Equipment operators will be in enclosed cabins while operating equipment and no site worker will be within active work zone during active excavation, loading, plowing/disking, and backfilling work. Site workers will inspect work areas after all equipment are de-energized and dust control measures are implemented.

** Until personal air monitoring indicate that airborne concentrations are below AL and PEL, APR particulate and tyvex shall be utilized by the crew.

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

9.0 AIR MONITORING

One shift of monitoring during excavation will be conducted to assess the appropriate PPE for the personnel working at the project site. The air monitoring will include the following samples:

- One (1) personal sample for Field Inspector;
- Continuous Area Air Monitoring (upwind and downwind);
- Contaminants to include:

Table 3: Air Monitoring Information

Chemical Compound	Method	Sample Locations	Cal/OSHA PEL (mg/m3)
Chromium	NIOSH 7300 – can use one cassette for all 3 metals	1. Personal – Field Inspector plus Field Blank	0.5
Copper			1.0
Lead			0.05
Total Particulate Matter	Real-Time Continuous Particulate Mass Monitoring	2 Area 2 – upwind location 3. Area 3 – downwind location	10

Should the results for the air monitoring be above the listed PELs, then personnel working in the sampling location areas must don the appropriate respiratory protection, half or full face respirator with P100 particulate cartridge.

9.1 Dust Control

Additional area air monitoring for total particulate matter will occur as well with one status up wind and a second down wind. The contractor will implement the following steps to mitigate hazards associated with the Fly Ash.

- Contractor will implement standard BMPs including watering of site surfaces prior to and during excavation.
- Using reduced speeds (below 5 miles per hour [mph]) for vehicle traffic on unpaved surfaces.
- Placing plastic sheeting below stockpiles and covering stockpiles at the end of each day.
- Street sweeping the entrance and exit to the site.
- Suspend all soil disturbance and travel if winds exceed 25 mph.

10.0 SITE CONTROL

The primary objective of site control is to minimize the exposure to potentially hazardous substances and/or situations. Supervision and controlling access to the work site is necessary to protect site personnel, visitors and the public.

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For this site, the following areas will be designated as hot, warm and cold zones:

Hot Zone: Area immediately surrounding excavation area

Warm Zone: ☒ NA

Cold Zone: 15 feet or greater away from excavation area

Check which is applicable:

☒ Work involving Physical Hazards

Work does *not* involve direct contact with hazardous substances. However, if the scope of work primarily involves physical hazards (i.e. vehicular traffic, heavy equipment operation, etc.), the establishment of a warm zone may is not necessary. Instead, a hot zone must be established to surround all the physical hazards. The hot zone area shall provide enough room and buffer to protect both workers and the public. A cold zone is established outside the hot zone to allow “support” activities to be conducted in a safe location.

☒ Work involving Chemical Hazards

The concept of site control and the establishment of hot/warm/cold work zones are intended for work involving the exposure (or potential exposure) to hazardous chemical concentrations. Under these circumstances, the purpose of work zones is two-fold: 1) minimize the exposure to potentially hazardous substances and 2) minimize the spread of hazardous substances outside the immediate work area through decontamination procedures.

A brief overview of site control work zones is provided below:

Hot Zone

- Where personnel may be subject to chemical or physical hazards.
- Where known or suspected contamination exists and may also be where equipment operation and/or environmental sampling will take place.
- To be clearly identified and should be isolated with cones, barricades, or high visibility caution tape.
- Large enough to provide sufficient room and buffer to protect both workers and the public.

Warm Zone

- Located between the hot and cold zones; beginning at the edge of the hot zone and extends to the cold zone.
- Utilized as a control point or corridor for persons entering or exiting the hot zone.
- Where personnel and equipment are decontaminated.

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Cold Zone

- Located outside the hot zone where administrative and other support functions are located.
 - Where adverse exposure to contaminants and physical hazards are unlikely.
-

10.1 Decontamination

The purpose of decontamination is to:

- (1) Remove chemical containments from personnel and/or equipment; and
- (2) Significantly reduce the spread of chemical contaminants beyond the hot/warm zone.

Decontamination is intended to occur within the warm zone. Depending on the project, there may be a need to decontaminate both personnel and equipment. The decontamination process should be appropriate to the chemical hazards present. For example refined petroleum contaminated soil on work boots/shoes may only require physical removal of the soil with a sturdy brush. However, decontamination of equipment (i.e. drilling augers) may require additional steps to ensure contaminants are not spread beyond the hot/warm zones. Heavy equipment (i.e. excavators, trucks used for waste transportation, etc.) may require a combination of steps, including the placement of gravel at the entrance/exit of the site.

10.1.1 Personnel Decontamination Procedures

☐ NA

- No eating or drinking will take place within the work zones. All employees are required to wash their hands prior to eating.

10.1.2 Equipment Decontamination Procedures

☐ NA

- Equipment will be decontaminated prior to leaving the work site.

10.2 Site Security

Appropriate security measures will be established in coordination with the site owner/operator and communicated to site personnel. The objective of these measures is to (1) protect the public from potential exposure to physical/chemical hazards; (2) avoid public interference with personnel and safe work practices; and (3) prevent theft or vandalism of equipment at the site.

Site specific security measures include:

☐ NA

- Contractor will install temporary site security measures for excavations and equipment.

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11.0 PERSONNEL TRAINING

TRC and Contractor personnel are required to acknowledge their understanding and willingness to comply with this HASP before admission to the site by signing the "Pre-job Safety Briefing" (See **Attachment F**).

Site specific training requirements are indicated below:

- ☒ Personnel shall meet the training requirements specified in the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard [29 CFR 1910.120(e) and CCR Title 8 Section 5192(e)].

If required to don respiratory protection, respiratory protection training would also be required.

12.0 MEDICAL PROGRAM

TRC has established a medical surveillance program to assess, monitor, and help protect the health of employees, in particular, employees who may be exposed to potentially hazardous substances during site work. Personnel undergo medical examinations as follows:

- **Initial:** Pre-employment / prior to any assignment involving work in a hazardous or potentially hazardous environment. The initial examination is used to establish a baseline picture of health against which future changes can be measured, and to identify any underlying illnesses or conditions that might be aggravated by chemical exposures or job activities. This exam also certifies whether an employee is medically fit to wear a respirator.
- **Periodic:** At least once every 12 to 24 months (depending on the employees involvement in field activities) to measure changes in health status. This exam certifies whether an employee is still medically fit to wear a respirator.
- **Upon notification:** As soon as possible upon notification by an employee that they have developed signs or symptoms indicating possible overexposure to hazardous substances, or in response to an injury or exposure during an emergency situation.
- **Exit:** At termination of employment.

13.0 EMERGENCY RESPONSE PLAN

The TRC SSO (depending on which is present) will have controlling authority during an emergency. In the SSO's absence, the Alternate SSO will be in charge.

13.1 Evacuation Protocol

Evacuation protocol, routes and assembly areas from the site will be established by the SSO, and communicated to Field Personnel during the Tailgate Safety Meeting(s) prior to initiating work. In the event of an evacuation, personnel will meet at a pre-established assembly areas and the TRC SSO conduct a "head count" to see that everyone is accounted for. Contractor SSO is responsible for being able to provide an accurate head-count of contractor personnel.

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Primary assembly area = TBD

Secondary assembly area = TBD

13.2 First Aid & CPR

TRC employees and Contractors with current First Aid and CPR certification and who are willing to provide First Aid and CPR will be asked to identify themselves at Tailgate Safety Meetings. Their names will be documented on the Pre-job Safety Briefing (**Attachment F**).

13.3 Emergency Medical Assistance

A list of emergency medical assistance sources has been established as part of this HASP. ATTACHMENT C lists the names, locations, and telephone numbers of emergency response organizations in the vicinity of the project site, and a map to the nearest hospital(s) with an emergency room.

A vehicle shall be available onsite during work activities to transport injured personnel to the identified emergency medical facilities, if necessary. Company vehicles are to be equipped with a fire extinguisher and first aid kit.

13.4 Emergency Procedures

In the event of an accident, injury, or other emergency, remember to:

- **Stop work and REMAIN CALM.**
- **Move personnel to a safe location (evacuation plan).**
- **Call 911 or notify other emergency facilities, as necessary.**
- **Address medical emergencies and apply first aid, if necessary.**
 - Move injured or exposed person(s) from immediate area only if it is safe to do so.
 - If serious injury or life-threatening condition exists, call 911. Clearly describe the location, injury and conditions to the dispatcher. Designate a person to direct emergency equipment to the injured person.
- **Contain physical hazards.**
 - Act only if hazard is minimal and you are trained to deal with the situation. Otherwise evacuate and wait for emergency services to arrive.
- **Notify SSO and initiate incident reporting procedures.**
 - See page 2 of this HASP for contact information. In the event the SSO is not available, the order of notification should be 1) Assistant SSO, 2) TRC Project Manager, 3) Office Safety Coordinator, 4) ECR Safety Manager, and 5) National Safety Director.
 - TRC SSO is to notify TRC Project Manager/Supervisor as soon as reasonably possible.
- Do not resume work until the SSO has determined it is safe to do so.

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13.5 Non-Emergency Medical Assistance

If an injury does occur and it is not life threatening, then the employee or employee's supervisor/project manager should contact WorkCare within the first hour after an injury. WorkCare information is provided in **Attachment G**. This information will help assist the injured employee by connecting them with instant access to a medically qualified professional in order to provide guidance on appropriate first aid measures and medications.

14.0 INCIDENT REPORTING

TRC personnel are to immediately report an incident to their Project Manager/Supervisor and follow the TRC incident reporting procedures (CP019) detailed in the TRC HSMS.

TRC's incident reporting forms are available in **Attachment H**, through the Project Manager/Supervisor, and include:

- TRC Incident Notification Report
- TRC Motor Vehicle Incident Report
- TRC Safe Catch Report

All incidents and near misses are investigated in accordance with TRC's HSMS. The TRC Incident Notification Report and is to be completed and submitted to the TRC ECR Safety Manager and National Safety Director within 24 hours following any incident.

Contractor personnel are to report incidents to their SSO who is then required to report the incident to the TRC SSO, TRC Alternate SSO or TRC Project Manager immediately.

Some important information to include when reporting an incident are:

1. A description of the event (including date and time)
2. Details regarding personal injury and property damage, if any.
3. Whether emergency services were notified (i.e., medical facilities, fire department, police department) and the basis for that decision. Including time and names of persons/agencies notified, and their response.
4. Clarify the need for and type of TRC support.
5. Immediate corrective action(s) taken.



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15.0 HEALTH AND SAFETY PLAN (HASP) SIGNATURE PAGE

Job Safety Analysis Author	Date:	HASP Author	Date:
	3/31/17		

Review/Approvals:

Site Safety Officer Facility/Field Supervisor	Date:	Project Manager/Supervisor*	Date:
			3/31/17
Office Safety Coordinator* <input type="checkbox"/> NA	Date	Safety Professional* <input type="checkbox"/> NA	Date
			3/31/17

Additional Information or Instructions:

* Note: For most projects, the Project Manager/Supervisor will review, approve and sign the HASP. In the event the operations are beyond the normal scope of work, additional review is available upon the request from the PM/Supervisor. The Office Safety Coordinator is the first recourse for reviewing HASPs not involving high-risk operations. It is recommended that for HASPs involving high-risk operations (i.e. hazardous exposures to chemicals, large scale or deep excavations, confined space entry, etc.), the ECR Safety Coordinator and/or a Safety Professional [Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP) or other professionally qualified person] be consulted for review of the HASP to ensure proper protective measures are being implemented.

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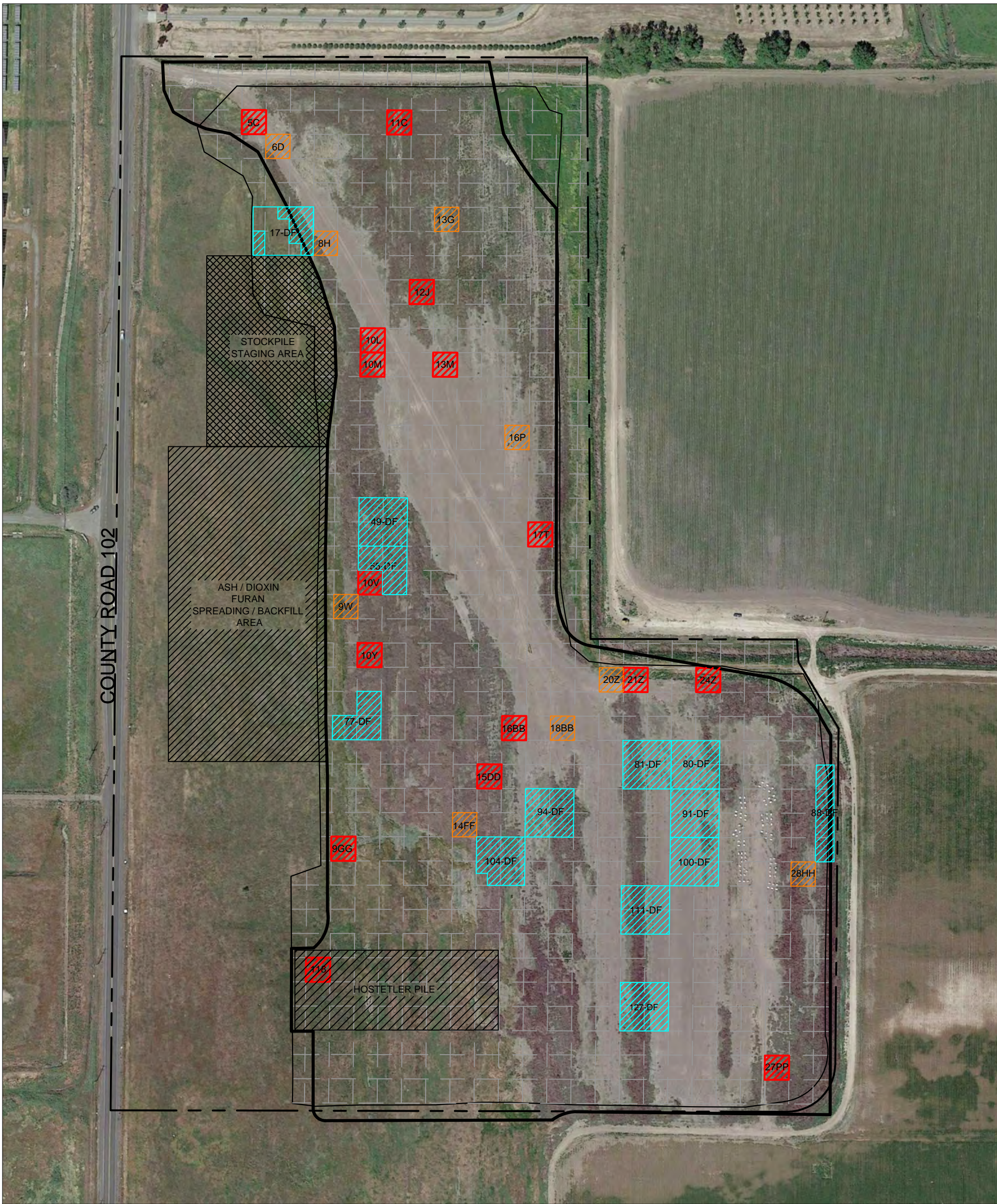
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ATTACHMENT A

SITE PLAN



SOURCE AERIAL PHOTO: Google Earth Professional, April 2015.

LEGEND:

--- APPROXIMATE SITE BOUNDARY

--- APPROXIMATE EXTENT OF ASH

--- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS

50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH

50' x 50' DECISION UNITS, EXCEEDING THE METAL CRITERIA, TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

50' x 50' DECISION UNITS, EXCEEDING THE METAL CRITERIA AND REQUIRING TREATMENT / STABILIZATION, TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

DIOXIN / FURAN DECISION UNITS, WITH TEQs GREATER THAN 40, TO BE EXCAVATED, STOCKPILED AND REUSED ONSITE BY BLENDING IT WITH UNDERLYING NATIVE SOIL BY DISKING

SCALE (FEET)



N

PROJECT:		LILLARD RANCH COUNTY ROAD 102 DAVIS, CALIFORNIA	
TITLE:		SITE PLAN	
DRAWN BY:	WC	PROJ NO.:	0000.0000.0000
CHECKED BY:	EC	FIGURE 2	
APPROVED BY:	EC		
DATE:	02/23/2017		
FILE NO.:		Grading Plan.dwg	



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ATTACHMENT B

**OCCUPATIONAL HEALTH GUIDELINES
AND TOXICOLOGICAL INFORMATION**

Safety Data Sheet

Section 1: Identification

Product identifier

Product Name • **Bed Ash**

Synonyms • Bottom Ash, Wood Bottom Ash, Biomass Bottom Ash

Chemical Category • Bed ash

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Agricultural soil amendment, bulking agent, soil stabilizer, moisture absorption reagent, road and construction material, landfill alternative daily cover/construction material

Details of the supplier of the safety data sheet

Manufacturer • Woodland Biomass Power, Ltd
1786 East Kentucky Ave
Woodland, CA 95776-6204 United States

Emergency telephone number

ChemTel • 800-255-3924, Outside of US and Canada – 01-813-248-0585
• CALL FOR CHEMICAL EMERGENCY (SPILL, FIRE, LEAK, EXPLOSION), Available 24 hours/day.

Section 2: Hazard Identification

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Skin Corrosion 1B
Serious Eye Damage 1
Carcinogenicity 1
Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
Specific Target Organ Toxicity Single Exposure 1
Specific Target Organ Toxicity Repeated Exposure 1
Combustible Dust

Label elements

OSHA HCS 2012

DANGER



Hazard statements • Causes severe skin burns and eye damage.
May cause respiratory irritation
May cause cancer via inhalation
Causes damage to Lungs via Inhalation

May cause damage to Lungs through prolonged or repeated exposure via inhalation

May form combustible dust concentrations in air.

Precautionary statements

- Prevention** • Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts or mists.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
In case of inadequate ventilation wear respiratory protection.
- Response** • IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Call a POISON CENTER or doctor/physician if you feel unwell.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN (or hair): Immediately take off all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

- Storage/Disposal** • Store in a dry place. Store in a closed container.
Store in a well-ventilated place.
Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

- Supplemental information** • This product may present an engulfment hazard. To prevent burial or suffocation, do not enter a confined space such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains ash.
Areas of accumulated Bed ash may retain heat for extended periods of time. Use caution when stepping into deep accumulations.
Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving ash through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and or injury to workers.

Other hazards

- OSHA HCS 2012 • No data available

Section 3 - Composition/Information on Ingredients

Mixture:

Composition				
Chemical Name	Identifiers	%	Hazardous	Classifications According to Regulation/Directive
Silicon Dioxide	CAS:14808-60-7	30% TO 50%	Yes	OSHA HCS 2012: H350, H372
Aluminum oxide	CAS:1344-28-1	5% TO 15%	Yes	OSHA HCS 2012: H332
Titanium dioxide	CAS:13463-67-7	0.1% TO 1%	Yes	OSHA HCS 2012: H315
Iron oxide	CAS:1309-37-1	1% TO 10%	Yes	OSHA HCS 2012: H315, H319, H335
Calcium oxide	CAS:1305-78-8	10% TO 20%	Yes	OSHA HCS 2012: H315, H318, H335
Sodium oxide	CAS:1313-59-3	1% TO 5%	Yes	OSHA HCS 2012: H271, H314, H318
Potassium oxide	CAS:12136-45-7	1% TO 5%	Yes	OSHA HCS 2012: H314

Bed Ash may contain the following trace or residual constituents below the reporting limits: arsenic, barium, cadmium, copper, lead, hexavalent

chromium, nickel, vanadium, zinc, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and dioxins/furans as 2,3,7,8-TCDD

Key to abbreviations

=H271 – May cause fire or explosion, strong oxidizer
=H314 – Causes severe skin burns and eye damage
=H315 – Causes skin irritation

= H318 – Causes serious eye damage
= H319– Causes serious eye irritation
= H332 – Harmful if inhaled

= H335 – May cause respiratory irritation
= H350 – May cause cancer via inhalation
= H372 – Causes damage to lungs through prolonged or repeated inhalation

Section 4: First-Aid Measures

Description of first aid measures

Inhalation • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician or poison control center immediately.

Skin • Immediately flush skin with large amounts of water. Remove contaminated clothing. If irritation (redness, rash, blistering) develops, get medical attention. Wash clothing before reuse.

Eye • IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion • If swallowed, DO NOT induce vomiting. Rinse mouth. Get medical attention immediately if symptoms occur.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media • Generally non-combustible.
In case of fire use media as appropriate for surrounding fire.

Unsuitable Extinguishing Media • No data available.

Firefighting Procedures • Keep unauthorized personnel away.

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards • Depending on moisture content, and more importantly, particle diameter and airborne concentration, Bed ash in a contained area may explode in the presence of an ignition source. Bed ash may similarly deflagrate (combustion without detonation like an explosion) if ignited in an open or loosely contained area. Completely combusted (pure) Bed ash is expected to have an extremely low potential for explosion, even under typical dust explosion conditions (i.e., high airborne concentrations in the presence of an ignition source).

Hazardous Combustion Products • Avoid heat and flames. When burned, toxic smoke and vapor may be emitted including, oxides of carbon, metal oxides and other toxic vapors.

Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA).

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not walk through spilled material.
- Emergency Procedures**
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Ventilate closed spaces before entering. Clean up using methods which avoid dust generation. Compressed air should not be used. During cleanup avoid inhalation and skin and eye contact. Provide local exhaust or dilution ventilation as required. Do not allow to enter sewers/surface or ground water.

Environmental precautions

- Avoid run off to waterways and sewers.

Methods and material for containment and cleaning up

- Containment/Clean-up Measures**
- Avoid generating dust.
Use appropriate Personal Protective Equipment (PPE)
Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations.

Section 7 - Handling and Storage

Precautions for safe handling

- Handling**
- Keep away from heat, sparks, and flame – No Smoking. Take precautionary measures against static charges. Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving ash through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and or injury to workers. Use only with adequate ventilation or closed system ventilation. When wet, Bed ash may become corrosive (pH > 12.5). Use proper personal protective equipment (gloves and goggles) when handling. Loading and unloading Bed ash may generate excessive airborne ash dust. Use a NIOSH-approved filtering face piece respirator (dust mask) and dust goggles when recommended allowable exposure limits may be exceeded. Keep bulk ash dry until used.

Conditions for safe storage, including any incompatibilities

- Storage**
- Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in a cool, dry, well-ventilated place. Stack material in a secure manner to prevent falling. Ash is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures. This product may present an engulfment hazard. To prevent burial or suffocation, do not enter a confined space such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains ash. Ash can build up or adhere to the walls of a confined space. The ash can release, collapse or fall unexpectedly. Areas of accumulated Bed ash may retain heat for extended periods of time. Use caution when stepping into deep accumulations. Bed ash should be stored and transported to the extent possible in a covered bin or container.

Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines • No data available on product. Individual component information provided when available.

Exposure Limits/Guidelines				
	IDLH	ACGIH TLV-TWA	NIOSH TWAs	OSHA PEL-TWAs
Titanium dioxide (13463-67-7)	5000 mg/m3 [Ca]	10 mg/m3	Not established	15 mg/m3 (total dust)
Iron oxide (1309-37-1)	2500 mg/m3 as Fe	5 mg/m3 (respirable fraction)	5 mg/m3 (dust and fume, as Fe)	10 mg/m3 (fume); 15 mg/m3 (total dust, listed under Rouge); 5 mg/m3 (respirable fraction, listed under Rouge)
Aluminum oxide (1344-28-1)	Not established	Not established	Not established	15 mg/m3 (total dust); 5 mg/m3 (respirable fraction)
Calcium oxide (1305-78-8)	25 mg/m3	2 mg/m3	2 mg/m3	5 mg/m3
Silicon dioxide (as quartz) (14808-60-7)	50 mg/m3	0.025 mg/m3 (respirable fraction)	0.05 mg/m3 (respirable dust)	Not established

Exposure controls

Engineering Measures/Controls

- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Emergency eye wash stations and deluge safety showers should be available in the work area.

Personal Protective Equipment

Pictograms



Respiratory

- Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, non-oil particle environment, air-purifying respirator equipped with N-, R-, or P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with N-, R-, or P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA. Warning! Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres. Air-purifying respirators are only effective for particle diameters greater than 2 micrometers.

Eye/Face

- Wear eye/face protection. Wear protective eyewear (goggles, face shield, or safety glasses).

Hands

- Wear appropriate gloves.

Skin/Body	<ul style="list-style-type: none"> Wear protective clothing - to prevent skin contact Standard industrial hygiene procedures should be practiced. Contaminated clothing needs to be changed, to prevent skin contact with adhesive; launder clothing appropriately before re-use.
General Industrial Hygiene Considerations	<ul style="list-style-type: none"> Practice good housekeeping and avoid creating/breathing dust. Do not allow dust to collect. Maintain, clean, and fit test respirators in accordance with OSHA regulations. Provide readily accessible eyewash stations and deluge shower.
Environmental Exposure Controls	<ul style="list-style-type: none"> No data available

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Granular	Color	Tan and/or gray to black.
Odor	No data available	Odor Threshold	No data available.
Particulate Size	150 to 6700 µm		
General Properties			
Boiling Point	Not Relevant	Melting Point	Not Relevant
pH	9 – 11.5, water	Specific Gravity/Relative Density	1.5 to 1.7 @ 4 C(39.2 F) Water=1
Water Solubility	0 to 1 %	Bulk Density	89.5 lb/ft3 (loose) 96.6 lb/ft3 (packed)
Volatility			
Vapor Pressure	Not Relevant	Vapor Density	Not Relevant
Evaporation Rate	Not Relevant		
Flammability			
Flash Point	No data available	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- Not determined for product as a whole.

Chemical stability

- Stable

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Calcium oxide will react with water to form calcium hydroxide.

Incompatible materials

- Iron dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

Hazardous decomposition products

- Oxides of carbon and toxic vapors may be released at elevated temperatures.

Section 11 - Toxicological Information

Information on toxicological effects

Other Material Information • No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects may arise if the product is mishandled and overexposure occurs.

Components		
Silicon Dioxide (as quartz) (30% TO 50%)	14808-60-7	Acute Toxicity: Ingestion-Oral-Rat TDLo • 120 g/kg; <i>Gastrointestinal:Hypermotility, diarrhea; Gastrointestinal:Other changes</i> ; Inhalation-Rat TCLo • 1 mg/kg; <i>Lungs, Thorax, or Respiration:Other changes; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation</i> ; Multi-dose Toxicity: Inhalation-Rat TCLo • 80 mg/m ³ 26 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Fibrosis, focal (pneumoconiosis); Blood:Changes in spleen; Immunological Including Allergic:Decrease in cellular immune response</i> ; Tumorigen / Carcinogen: Inhalation-Rat TCLo • 50 mg/m ³ 6 Hour(s) 71 Week(s)-Intermittent; <i>Tumorigenic:Carcinogenic by RTECS criteria; Liver:Tumors</i>
Aluminum oxide (5% TO 15%)	1344-28-1	Multi-dose Toxicity: Inhalation-Rat TCLo • 200 mg/m ³ 5 Hour(s) 28 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Structural or functional change in trachea or bronchi; Lungs, Thorax, or Respiration:Chronic pulmonary edema; Related to Chronic Data:Death in the Other Multiple Dose data type field</i>
Titanium dioxide (0.1% TO 1%)	13463-67-7	Irritation: Skin-Human • 300 µg 3 Day(s)-Intermittent • Mild irritation; Multi-dose Toxicity: Inhalation-Rat TCLo • 10 mg/m ³ 6 Hour(s) 13 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Fibrosis (interstitial); Lungs, Thorax, or Respiration:Other changes; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation</i> ; Tumorigen / Carcinogen: Inhalation-Rat • 10 mg/m ³ 18 Hour(s) 2 Year(s)-Intermittent; <i>Tumorigenic:Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration:Tumors</i>
Iron oxide (1% TO 10%)	1309-37-1	Acute Toxicity: Inhalation-Rat TCLo • 50 mg/m ³ 12 Hour(s); <i>Behavioral:Excitement; Behavioral:Fluid intake; Gastrointestinal:Hypermotility, diarrhea</i> ; Inhalation-Rat TCLo • 0.8 mg/kg; <i>Lungs, Thorax, or Respiration:Emphysema; Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:Multiple enzyme effects; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation</i> ; Tumorigen / Carcinogen: Subcutaneous-Rat TDLo • 135 mg/kg; <i>Tumorigenic:Equivocal tumorigenic agent by RTECS criteria; Tumorigenic:Tumors at site of application</i>

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012•Data lacking
Aspiration Hazard	OSHA HCS 2012•Data lacking
Carcinogenicity	OSHA HCS 2012•Carcinogenicity 1
Germ Cell Mutagenicity	OSHA HCS 2012•Data lacking
Skin corrosion/Irritation	OSHA HCS 2012•Skin Corrosion 1B
Skin sensitization	OSHA HCS 2012•Data lacking
STOT-RE	OSHA HCS 2012•Specific Target Organ Toxicity Repeated Exposure 1
STOT-SE	OSHA HCS 2012•Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
Toxicity for Reproduction	OSHA HCS 2012•Data lacking
Respiratory sensitization	OSHA HCS 2012•Data lacking
Serious eye damage/Irritation	OSHA HCS 2012•Serious Eye Damage 1

- Target Organs**
- Lungs
- Route(s) of entry/exposure**
- Inhalation, Skin, Eye
- Medical Conditions Aggravated by Exposure**
- May aggravate asthma or other respiratory disorders.
- Potential Health Effects**

Inhalation

- Acute (Immediate)**
- May cause respiratory irritation.
- Chronic (Delayed)**
- Chronic overexposure to dust containing respirable sized crystalline silica can cause delayed lung injury (Silicosis). Inhalation of dust containing crystalline silica may contribute to pre-existing pulmonary diseases such as asthma and lung disorders associated with smoking. Repeated and prolonged exposure to dust may cause lung effects including pneumoconiosis.

Skin

- Acute (Immediate)**
- Causes severe skin burns and eye damage.
- Chronic (Delayed)**
- No data available.

Eye

- Acute (Immediate)**
- Causes serious eye damage.
- Chronic (Delayed)**
- No data available.

Ingestion

- Acute (Immediate)**
- May cause irritation.
- Chronic (Delayed)**
- No data available.
- Mutagenic Effects**
- No data available.
- Carcinogenic Effects**
- Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Titanium dioxide	13463-67-7	Group 2B-Possible Carcinogen	Not Listed
Iron oxide	1309-37-1	Group 3-Not Classifiable	Not Listed
Silicon Dioxide, as Quartz	14808-60-7	Group 1-Carcinogenic	Known Human Carcinogen

Section 12 - Ecological Information

Toxicity

- Data lacking on product. Product is highly alkaline when wet (>12.5). Avoid spillage and/or runoff into waterways. May be toxic to aquatic life.

Persistence and degradability

- No data available.

Bioaccumulative potential

- No data available.

Mobility in Soil

- No data available.

Section 13 - Disposal Considerations

Waste treatment methods

- Product waste** • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.
- Packaging waste** • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. Empty containers may contain product residue, follow SDS and label warnings even after they are emptied.

Section 14 - Transport Information

	UN number	UN proper shipping name*	Transport hazard class(es)	Packing group	Environmental hazards
DOT	NDA	Bed Ash	NDA	NDA	NDA
	NDA	NDA	NDA	NDA	NDA
TDG	NDA	NDA	NDA	NDA	NDA
IMO/IMDG	NDA	NDA	NDA	NDA	NDA

Special precautions for user

- None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code • Not Applicable.

Other information – * When shipping as a non-RCRA hazardous waste, use the following: Non-RCRA Hazardous Waste, Solids (Lead, Arsenic and Copper)

DOT • Not regulated as a hazardous material.

TDG • Not regulated as a dangerous good.

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

- The following listing of regulations may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

SARA Hazard Classifications • Acute, Chronic

Inventory			
Component	CAS	Canada DSL	TSCA
Bed Ash as Bed ash	NDA	No	No
Aluminum oxide	1344-28-1	Yes	Yes
Calcium oxide	1305-78-8	Yes	Yes
Iron oxide	1309-37-1	Yes	Yes
Potassium oxide	12136-45-7	Yes	Yes
Silicon dioxide (as quartz)	14808-60-7	Yes	Yes
Sodium oxide	1313-59-3	Yes	Yes
Titanium dioxide	13463-67-7	Yes	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Bed Ash as Bed ash		Not Listed
•Sodium oxide	1313-59-3	E
•Potassium oxide	12136-45-7	E
•Calcium oxide	1305-78-8	E
•Iron oxide	1309-37-1	Uncontrolled product according to WHMIS classification criteria D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Titanium dioxide, mixture containing on Health Canada's WHMIS Division website.)
•Titanium dioxide	13463-67-7	
•Aluminum oxide	1344-28-1	Uncontrolled product according to WHMIS classification criteria D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health Canada's WHMIS Division website.)
•Silicon Dioxide, as Quartz	14808-60-7	

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Bed Ash as Bed ash and components (unless listed below):	Not Listed
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Environment

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

•Bed Ash as Bed ash and components (unless listed below):	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

•Bed Ash as Bed ash and components (unless listed below):	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

•Bed Ash as Bed ash and components (unless listed below):	Not Listed
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U.S. - CERCLA/SARA - Section 313 - Emission Reporting

•Bed Ash as Bed ash and components (unless listed below):		Not Listed
•Aluminum oxide	1344-28-1	1.0 % de minimis concentration (fibrous forms)

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

•Bed Ash as Bed ash and components (unless listed below):		Not Listed
•Titanium dioxide	13463-67-7	carcinogen, initial date 9/2/11 (airborne, unbound particles of respirable size)
•Silicon dioxide, as quartz	14808-60-7	carcinogen, initial date 10/1/88 (airborne particles of respirable size)

•Arsenic (trace element)	7440-38-2	carcinogen, initial date 10/1/87
•Cadmium (trace element) (a)	7440-43-9	carcinogen, initial date 2/27/87
•Hexavalent chromium (trace element)	18540-29-9	carcinogen, initial date 2/27/87 (inhalation)
•Nickel (trace element)	7440-02-0	carcinogen, initial date 10/1/89
•Lead and lead compounds (trace element) (a)		carcinogen, initial date 10/1/92
•2,3,7,8-Tetrachlorodibenzo-p-dioxin (trace constituent) (a)	1746-01-6	carcinogen, initial date 1/1/88
•Benzo(a)anthracene (trace constituent) (a)	56-55-3	carcinogen, initial date 7/1/87
•Benzo(b)fluoranthene (trace constituent) (a)	50-32-8	carcinogen, initial date 7/1/87
•Benzo(k)fluoranthene (trace constituent) (a)	207-08-9	carcinogen, initial date 7/1/87
•Chrysene (trace constituent) (a)	218-01-9	carcinogen, initial date 7/1/87
U.S. - California - Proposition 65 – Reproductive Toxicity		
•Bed Ash as Bed ash and components (unless listed below):		Not Listed
•Cadmium (trace element)	1746-01-6	Developmental male and female, initial date 5/1/97
•Hexavalent chromium (trace element)	18540-29-9	developmental male and female, initial date 12/19/08
•Lead (trace element)		developmental male and female, initial date 2/27/87
•2,3,7,8-Tetrachlorodibenzo-p-dioxin (trace constituent)	1746-01-6	developmental, initial date 4/1/91
U.S. - California – Non-RCRA Hazardous Waste 22CCR§66261.24		
•Bed Ash as Bed ash and components (unless listed below):		Not Listed
•Copper (trace element)	7440-50-8	25 mg/L STLC, 2,500 mg/kg TTLC wet weight

(a) Pursuant to 27 CCR §25711 (a)(1), Concentrations are below Federal/State soil screening levels at a cancer risk of 1E-05. Therefore trace levels pose no significant risk.

Section 16 - Other Information

Classification method for mixtures	• Cut-off values/concentration limits of ingredients. Calculation method. Skin and eye classification based upon material pH.
Last Revision Date	• 09/08/16
Preparation Date	• 06/10/15
Disclaimer/Statement of Liability	• This information is taken from sources or based upon data believed to be reliable. However, (the local generation plant) makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

Safety Data Sheet

Section 1: Identification

Product identifier

Product Name • Fly Ash

Synonyms • Wood Fly Ash, Biomass Fly Ash, Ash

Chemical Category • Fly ash

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Agricultural soil amendment, bulking agent, soil stabilizer, moisture absorption reagent, road and construction material, landfill alternative daily cover/construction material

Details of the supplier of the safety data sheet

Manufacturer • Woodland Biomass Power, Ltd
1786 East Kentucky Ave
Woodland, CA 95776-6204 United States

Emergency telephone number

ChemTel • 800-255-3924, Outside of US and Canada – 01-813-248-0585
• CALL FOR CHEMICAL EMERGENCY (SPILL, FIRE, LEAK, EXPLOSION), Available 24 hours/day.

Section 2: Hazard Identification

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012

- Skin Corrosion 1B
- Serious Eye Damage 1
- Carcinogenicity 1
- Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
- Specific Target Organ Toxicity Single Exposure 1
- Specific Target Organ Toxicity Repeated Exposure 1
- Specific Target Organ Toxicity Repeated Exposure 2
- Combustible Dust

Label elements

OSHA HCS 2012

DANGER



Hazard statements Hazard Statements (cont'd)	<ul style="list-style-type: none"> Causes severe skin burns and eye damage. May cause respiratory irritation May cause cancer via inhalation Causes damage to organs - Lungs via Inhalation May cause damage to organs - Lungs, Silicosis, Liver/Hepatotoxin, Kidney/Nephrotoxin through prolonged or repeated exposure via inhalation May form combustible dust concentrations in air.
	Precautionary statements Prevention <ul style="list-style-type: none"> Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dusts or mists. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection. Response <ul style="list-style-type: none"> IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. IF ON SKIN (or hair): Immediately take off all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. Storage/Disposal <ul style="list-style-type: none"> Store in a dry place. Store in a closed container. Store in a well-ventilated place. Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. Supplemental information <ul style="list-style-type: none"> This product may present an engulfment hazard. To prevent burial or suffocation, do not enter a confined space such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains ash. Areas of accumulated fly ash may retain heat for extended periods of time. Use caution when stepping into deep accumulations. Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving ash through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and or injury to workers.
Other hazards OSHA HCS 2012	<ul style="list-style-type: none"> No data available

Section 3 - Composition/Information on Ingredients

Mixtures

Composition				
Chemical Name	Identifiers	%	Hazardous	Classifications According to Regulation/Directive
Sulfur	CAS:7704-34-9	5% TO 10%	Yes	OSHA HCS 2012: H315
Silicon Dioxide	CAS:14808-60-7	30% TO 50%	Yes	OSHA HCS 2012: H350, H372
Aluminum oxide	CAS:1344-28-1	5% TO 15%	Yes	OSHA HCS 2012: H332
Titanium dioxide	CAS:13463-67-7	0.1% TO 1%	Yes	OSHA HCS 2012: H315
Iron oxide	CAS:1309-37-1	1% TO 10%	Yes	OSHA HCS 2012: H315, H319, H335
Calcium oxide	CAS:1305-78-8	10% TO 20%	Yes	OSHA HCS 2012: H315, H318, H335
Sodium oxide	CAS:1313-59-3	1% TO 5%	Yes	OSHA HCS 2012: H271, H314, H318
Potassium oxide	CAS:12136-45-7	1% TO 5%	Yes	OSHA HCS 2012: H314
Phosphorus oxide	CAS:1314-56-3	1% TO 5%	Yes	OSHA HCS 2012: H330, H314, H318
Sulfur trioxide	CAS:7446-11-9	1% TO 5%	Yes	OSHA HCS 2012: H314, H318, H335

Fly Ash may contain the following trace or residual constituents below the reporting limits: arsenic, barium, cadmium, copper, lead, hexavalent chromium, nickel, vanadium, zinc, benzo(b)fluoranthene, benzo(g,h,i)perylene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, dioxins/furans as 2,3,7,8-TCDD.

Key to abbreviations

H271 – May cause fire or explosion, strong oxidizer	= H319– Causes serious eye irritation	= H350 – May cause cancer via inhalation
H314 – Causes severe skin burns and eye damage	= H330 – Fatal if inhaled	= H372 – Causes damage to lungs through prolonged or repeated inhalation
H315 – Causes skin irritation	= H332 – Harmful if inhaled	
H318 – Causes serious eye damage	= H335 – May cause respiratory irritation	

Section 4: First-Aid Measures

Description of first aid measures

Inhalation • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician or poison control center immediately.

Skin • Immediately flush skin with large amounts of water. Remove contaminated clothing. If irritation (redness, rash, blistering) develops, get medical attention. Wash clothing before reuse.

Eye • IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion • If swallowed, DO NOT induce vomiting. Rinse mouth. Get medical attention immediately if symptoms occur.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable	• Generally non-combustible.
Extinguishing Media	In case of fire use media as appropriate for surrounding fire.
Unsuitable	• No data available.
Extinguishing Media	

**Firefighting
Procedures**

- Keep unauthorized personnel away.

Special hazards arising from the substance or mixture**Unusual Fire and
Explosion Hazards**

- Depending on moisture content, and more importantly, particle diameter and airborne concentration, fly ash in a contained area may explode in the presence of an ignition source. Fly ash may similarly deflagrate (combustion without detonation like an explosion) if ignited in an open or loosely contained area. Completely combusted (pure) fly ash is expected to have an extremely low potential for explosion, even under typical dust explosion conditions (i.e., high airborne concentrations in the presence of an ignition source).

**Hazardous
Combustion Products**

- Avoid heat and flames. When burned, toxic smoke and vapor may be emitted including, oxides of carbon, metal oxides and other toxic vapors.

Advice for firefighters

- Wear positive pressure self-contained breathing apparatus (SCBA).

Section 6 - Accidental Release Measures**Personal precautions, protective equipment and emergency procedures****Personal Precautions**

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not walk through spilled material.

**Emergency
Procedures**

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Ventilate closed spaces before entering. Clean up using methods which avoid dust generation. Compressed air should not be used. During cleanup avoid inhalation and skin and eye contact. Provide local exhaust or dilution ventilation as required. Do not allow to enter sewers/surface or ground water.

Environmental precautions

- Avoid run off to waterways and sewers.

Methods and material for containment and cleaning up**Containment/Clean-up
Measures**

- Avoid generating dust.
Use appropriate Personal Protective Equipment (PPE)
Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations.

Section 7 - Handling and Storage**Precautions for safe handling****Handling**

- Keep away from heat, sparks, and flame – No Smoking. Take precautionary measures against static charges. Properly ground all pneumatic conveyance systems. The potential exists for static build-up and static discharge when moving ash through a plastic, non-conductive, or non-grounded pneumatic conveyance system. The static discharge may result in damage to equipment and or injury to workers. Use only with adequate ventilation or closed system ventilation. When wet, fly ash may become corrosive (pH > 12.5). Use proper personal protective equipment (gloves and goggles) when handling. Loading and unloading fly ash may generate excessive airborne ash dust. Use a NIOSH-approved filtering face piece respirator (dust mask) and dust goggles when recommended allowable exposure limits may be exceeded. Keep bulk ash dry until used.

Conditions for safe storage, including any incompatibilities

Storage • Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in a cool, dry, well-ventilated place. Stack material in a secure manner to prevent falling. Ash is heavy and poses risks such as sprains and strains to the back, arms, shoulders and legs during lifting and mixing. Handle with care and use appropriate control measures. This product may present an engulfment hazard. To prevent burial or suffocation, do not enter a confined space such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains ash. Ash can build up or adhere to the walls of a confined space. The ash can release, collapse or fall unexpectedly. Areas of accumulated fly ash may retain heat for extended periods of time. Use caution when stepping into deep accumulations. Fly ash should be stored and transported to the extent possible in a covered bin or container.

Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines • No data available on product. Individual component information provided when available.

Exposure Limits/Guidelines				
	IDLH	ACGIH TLV-TWA	NIOSH TWAs	OSHA PEL-TWAs
Titanium dioxide (13463-67-7)	5000 mg/m3 [Ca]	10 mg/m3	Not established	15 mg/m3 (total dust)
Iron oxide (1309-37-1)	2500 mg/m3 as Fe	5 mg/m3 (respirable fraction)	5 mg/m3 (dust and fume, as Fe)	10 mg/m3 (fume); 15 mg/m3 (total dust, listed under Rouge); 5 mg/m3 (respirable fraction, listed under Rouge)
Aluminum oxide (1344-28-1)	Not established	Not established	Not established	15 mg/m3 (total dust); 5 mg/m3 (respirable fraction)
Calcium oxide (1305-78-8)	25 mg/m3	2 mg/m3	2 mg/m3	5 mg/m3
Silicon dioxide (as quartz) (14808-60-7)	50 mg/m3	0.025 mg/m3 (respirable fraction)	0.05 mg/m3 (respirable dust)	Not established

Exposure controls

Engineering Measures/Controls • Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values. Emergency eye wash stations and deluge safety showers should be available in the work area.

Personal Protective Equipment

Pictograms



Respiratory

- Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen.

**Respiratory
(cont'd)**

Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, non-oil particle environment, air-purifying respirator equipped with N-, R-, or P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with N-, R-, or P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately dangerous to life or health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA. Warning! Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres. Air-purifying respirators are only effective for particle diameters greater than 2 micrometers.

Eye/Face

- Wear eye/face protection. Wear protective eyewear (goggles, face shield, or safety glasses).

Hands

- Wear appropriate gloves.

Skin/Body

- Wear protective clothing - to prevent skin contact Standard industrial hygiene procedures should be practiced. Contaminated clothing needs to be changed, to prevent skin contact with adhesive; launder clothing appropriately before re-use.

**General Industrial
Hygiene
Considerations**

- Practice good housekeeping and avoid creating/breathing dust. Do not allow dust to collect. Maintain, clean, and fit test respirators in accordance with OSHA regulations. Provide readily accessible eyewash stations and deluge shower.

Environmental

- No data available

Exposure Controls**Section 9 - Physical and Chemical Properties****Information on Physical and Chemical Properties**

Material Description			
Physical Form	Powder	Color	Tan and/or gray to black.
Odor	No data available	Odor Threshold	No data available.
Particulate Size	75 to 6700 µm		
General Properties			
Boiling Point	Not Relevant	Melting Point	Not Relevant
pH	11-13, water	Specific Gravity/Relative Density	0.8 to 1.1 @ 4 C(39.2 F) Water=1
Water Solubility	0 to 1 %	Bulk Density	43.9 lb/ft3 (loose) 61.6 lb/ft3 (packed)
Volatility			
Vapor Pressure	Not Relevant	Vapor Density	Not Relevant
Evaporation Rate	Not Relevant		
Flammability			
Flash Point	No data available	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- Not determined for product as a whole.

Chemical stability

- Stable

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Calcium oxide will react with water to form calcium hydroxide.

Incompatible materials

- Iron dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

Hazardous decomposition products

- Oxides of carbon and toxic vapors may be released at elevated temperatures.

Section 11 - Toxicological Information

Information on toxicological effects

Other Material Information • No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects may arise if the product is mishandled and overexposure occurs.

Components		
Sulfur (5% TO 10%)	7704-34-9	Acute Toxicity: Inhalation-Mammal LC50 • 1660 mg/m ³ ; Irritation: Eye-Human • 8 ppm; Multi-dose Toxicity: Inhalation-Rat TCLo • 1.76 mg/m ³ 4 Hour(s) 30 Day(s)-Intermittent; <i>Liver:</i> Hepatitis (hepatocellular necrosis), diffuse; Kidney, Ureter, and Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis); Inhalation-Rat TCLo • 12.68 mg/m ³ 4 Hour(s) 15 Day(s)-Intermittent; <i>Liver:</i> Hepatitis (hepatocellular necrosis), diffuse; Kidney, Ureter, and Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis)
Silicon Dioxide (as quartz) (30% TO 50%)	14808-60-7	Acute Toxicity: Ingestion/Oral-Rat TDLo • 120 g/kg; <i>Gastrointestinal:</i> Hypermotility, diarrhea; <i>Gastrointestinal:Other changes;</i> Inhalation-Rat TCLo • 1 mg/kg; <i>Lungs, Thorax, or Respiration:Other changes; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation;</i> Multi-dose Toxicity: Inhalation-Rat TCLo • 80 mg/m ³ 26 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosis, focal (pneumoconiosis); Blood:Changes in spleen; Immunological Including Allergic:Decrease in cellular immune response; Tumorigen / Carcinogen: Inhalation-Rat TCLo • 50 mg/m ³ 6 Hour(s) 71 Week(s)-Intermittent; <i>Tumorigenic:</i> Carcinogenic by RTECS criteria; Liver:Tumors
Aluminum oxide (5% TO 15%)	1344-28-1	Multi-dose Toxicity: Inhalation-Rat TCLo • 200 mg/m ³ 5 Hour(s) 28 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Structural or functional change in trachea or bronchi; Lungs, Thorax, or Respiration:Chronic pulmonary edema; Related to Chronic Data:Death in the Other Multiple Dose data type field
Titanium dioxide (0.1% TO 1%)	13463-67-7	Irritation: Skin-Human • 300 µg 3 Day(s)-Intermittent • Mild irritation; Multi-dose Toxicity: Inhalation-Rat TCLo • 10 mg/m ³ 6 Hour(s) 13 Week(s)-Intermittent; <i>Lungs, Thorax, or Respiration:</i> Fibrosis (interstitial); Lungs, Thorax, or Respiration:Other changes; <i>Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation;</i> Tumorigen / Carcinogen: Inhalation-Rat • 10 mg/m ³ 18 Hour(s) 2 Year(s)-Intermittent; <i>Tumorigenic:</i> Carcinogenic by RTECS criteria; Lungs, Thorax, or Respiration:Tumors

Components (cont'd)		
Iron oxide (1% TO 10%)	1309-37-1	Acute Toxicity: Inhalation-Rat TCl ₀ • 50 mg/m ³ 12 Hour(s); Behavioral:Excitement; Behavioral:Fluid intake; Gastrointestinal:Hypermotility, diarrhea; Inhalation-Rat TCl ₀ • 0.8 mg/kg; Lungs, Thorax, or Respiration:Emphysema; Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:Multiple enzyme effects; Biochemical:Metabolism (intermediary):Effect on inflammation or mediation of inflammation; Tumorigen / Carcinogen: Subcutaneous-Rat TDLo • 135 mg/kg; Tumorigenic:Equivocal tumorigenic agent by RTECS criteria; Tumorigenic:Tumors at site of application
Phosphorus oxide (1% TO 5%)	1314-56-3	Acute Toxicity: Ingestion/Oral-Rat LD50 • 3478 mg/kg; Multi-dose Toxicity: Inhalation-Mammal TCl ₀ • 200 mg/m ³ 24 Hour(s) 10 Day(s)-Continuous; Lungs, Thorax, or Respiration:Structural or functional change in trachea or bronchi
Sulfur trioxide (1% TO 5%)	7446-11-9	Acute Toxicity: Inhalation-Human TCl ₀ • 30 mg/m ³ ; Sense Organs and Special Senses:Olfaction:Other changes; Lungs, Thorax, or Respiration:Cough; Lungs, Thorax, or Respiration:Other changes

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012•Data lacking
Aspiration Hazard	OSHA HCS 2012•Data lacking
Carcinogenicity	OSHA HCS 2012•Carcinogenicity 1
Germ Cell Mutagenicity	OSHA HCS 2012•Data lacking
Skin corrosion/Irritation	OSHA HCS 2012•Skin Corrosion 1B
Skin sensitization	OSHA HCS 2012•Data lacking
STOT-RE	OSHA HCS 2012•Specific Target Organ Toxicity Repeated Exposure 1; Specific Target Organ Toxicity Repeated Exposure 2
STOT-SE	OSHA HCS 2012•Specific Target Organ Toxicity Single Exposure 1; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
Toxicity for Reproduction	OSHA HCS 2012•Data lacking
Respiratory sensitization	OSHA HCS 2012•Data lacking
Serious eye damage/Irritation	OSHA HCS 2012•Serious Eye Damage 1

Target Organs

- Lungs, Liver/Hepatotoxin, Kidney/Nephrotoxin, Silicosis

Route(s) of entry/exposure

- Inhalation, Skin, Eye

Medical Conditions

- May aggravate asthma or other respiratory disorders.

Aggravated by Exposure

Potential Health Effects

Inhalation

Acute (Immediate)

- May cause respiratory irritation.

Chronic (Delayed)

- Chronic overexposure to dust containing respirable sized crystalline silica can cause delayed lung injury (Silicosis). Inhalation of dust containing crystalline silica may contribute to pre-existing pulmonary diseases such as asthma and lung disorders associated with smoking. Repeated and prolonged exposure to dust may cause lung effects including pneumoconiosis. Repeated and prolonged exposure may affect the kidneys. Symptoms may include but are not limited to weight loss, nausea, swelling of the arms and legs, vomiting, fatigue, headaches, decreased urine or urine that is mostly water, decreased mental sharpness, and muscle cramps and shakes. Repeated and prolonged exposure may affect the liver. Symptoms may include yellowing of the skin (jaundice), intense fatigue, loss of appetite, nausea, vomiting, and confusion.

Skin

Acute (Immediate) • Causes severe skin burns and eye damage.

Chronic (Delayed) • No data available.

Eye

Acute (Immediate) • Causes serious eye damage.

Chronic (Delayed) • No data available.

Ingestion

Acute (Immediate) • May cause irritation.

Chronic (Delayed) • No data available.

Mutagenic Effects • No data available.

Carcinogenic Effects • Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Titanium dioxide	13463-67-7	Group 2B-Possible Carcinogen	Not Listed
Iron oxide	1309-37-1	Group 3-Not Classifiable	Not Listed
Sulfur trioxide	7446-11-9	Group 1-Carcinogenic	Not Listed
Silicon Dioxide, as Quartz	14808-60-7	Group 1-Carcinogenic	Known Human Carcinogen

Section 12 - Ecological Information

Toxicity

- Data lacking on product. Product is highly alkaline when wet (>12.5). Avoid spillage and/or runoff into waterways. May be toxic to aquatic life.

Persistence and degradability

- No data available.

Bioaccumulative potential

- No data available.

Mobility in Soil

- No data available.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. Empty containers may contain product residue, follow SDS and label warnings even after they are emptied.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Environmental hazards
DOT	NDA	Fly Ash	NDA	NDA	NDA
	NDA	NDA	NDA	NDA	NDA
TDG	NDA	NDA	NDA	NDA	NDA
IMO/IMDG	NDA	NDA	NDA	NDA	NDA

Special precautions for user

- None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Not Applicable.

Other information

DOT • Not regulated as a hazardous material.

TDG • Not regulated as a dangerous good.

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

- The following listing of regulations may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

SARA Hazard Classifications • Acute, Chronic

Inventory			
Component	CAS	Canada DSL	TSCA
Fly Ash as Fly ash	NDA	No	No
Aluminum oxide	1344-28-1	Yes	Yes
Calcium oxide	1305-78-8	Yes	Yes
Chlorine	7782-50-5	Yes	Yes
Iron oxide	1309-37-1	Yes	Yes
Phosphorus oxide	1314-56-3	Yes	Yes
Potassium oxide	12136-45-7	Yes	Yes
Quartz	14808-60-7	Yes	Yes
Sodium oxide	1313-59-3	Yes	Yes
Sulfur	7704-34-9	Yes	Yes
Sulfur trioxide	7446-11-9	Yes	Yes
Titanium dioxide	13463-67-7	Yes	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Fly Ash as Fly ash		Not Listed
•Sodium oxide	1313-59-3	E
•Potassium oxide	12136-45-7	E
•Phosphorus oxide	1314-56-3	D1A, E
•Sulfur trioxide	7446-11-9	Not Listed
•Calcium oxide	1305-78-8	E
•Iron oxide	1309-37-1	Uncontrolled product according to WHMIS classification criteria D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Titanium dioxide, mixture containing on Health Canada's WHMIS Division website.)
•Titanium dioxide	13463-67-7	Uncontrolled product according to WHMIS classification criteria B4 D2A (In certain cases, this classification does not apply. For more information, consult the section Substance Specific Issues - Silica, crystalline, encapsulated on Health Canada's WHMIS Division website.)
•Aluminum oxide	1344-28-1	
•Sulfur	7704-34-9	
•Silicon Dioxide, as Quartz	14808-60-7	

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Fly Ash as Fly ash and components (unless listed below):		Not Listed
•Sulfur trioxide	7446-11-9	1000 lb TQ

Environment

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

•Fly Ash as Fly ash and components (unless listed below):		Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

•Fly Ash as Fly ash and components (unless listed below):		Not Listed
•Sulfur trioxide	7446-11-9	100 lb EPCRA RQ

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

•Fly Ash as Fly ash and components (unless listed below):		Not Listed
•Sulfur trioxide	7446-11-9	100 lb TPQ (This material is a reactive solid. The TPQ does not default to 10000 pounds for non-powder, non-molten, non-solution form)

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

•Fly Ash as Fly ash and components (unless listed below):		Not Listed
•Aluminum oxide	1344-28-1	1.0 % de minimis concentration (fibrous forms)

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

•Fly Ash as Fly ash and components (unless listed below):

•Titanium dioxide	13463-67-7	Not Listed carcinogen, initial date 9/2/11 (airborne, unbound particles of respirable size)
•Silicon dioxide, as quartz	14808-60-7	carcinogen, initial date 10/1/88 (airborne particles of respirable size)
•Arsenic (trace element)	7440-38-2	carcinogen, initial date 10/1/87
•Cadmium (trace element) (a)	7440-43-9	carcinogen, initial date 2/27/87
•Hexavalent chromium (trace element)	18540-29-9	carcinogen, initial date 2/27/87 (inhalation)
•Nickel (trace element)	7440-02-0	carcinogen, initial date 10/1/89
•Lead and lead compounds (trace element) (a)		carcinogen, initial date 10/1/92
•2,3,7,8-Tetrachlorodibenzo-p-dioxin (trace constituent) (a)	1746-01-6	carcinogen, initial date 1/1/88
•Benzo(b)fluoranthene (trace constituent) (a)	50-32-8	carcinogen, initial date 7/1/87
•Indeno(1,2,3-cd)pyrene (trace constituent) (a)	193-39-5	carcinogen, initial date 1/1/88

U.S. - California - Proposition 65 – Reproductive Toxicity

•Fly Ash as Fly ash and components (unless listed below):

•Cadmium (trace element)	1746-01-6	Not Listed Developmental male and female, initial date 5/1/97
•Hexavalent chromium (trace element)	18540-29-9	developmental male and female, initial date 12/19/08
•Lead (trace element)		developmental male and female, initial date 2/27/87
•2,3,7,8-Tetrachlorodibenzo-p-dioxin (trace element)	1746-01-6	developmental, initial date 4/1/91

(a) Pursuant to 27 CCR §25711 (a)(1), Concentrations are below Federal/State soil screening levels at a cancer risk of 1E-05. Therefore trace levels pose no significant risk.

Section 16 - Other Information

Classification method for mixtures • Cut-off values/concentration limits of ingredients. Calculation method. Skin and eye classification based upon material pH.

Last Revision Date • September 8, 2016

Preparation Date • June 10, 2015

Disclaimer/Statement of Liability • This information is taken from sources or based upon data believed to be reliable. However, (the local generation plant) makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

Table B-1

**OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION
Gasoline Constituents**

Insert new Rev 1. Occupational Health Guidelines and Toxicological Information Table



GREG1.pdf

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT C

EMERGENCY SERVICES

PHONE NUMBERS, DIRECTIONS, AND LOCAL AREA MAP

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

EMERGENCY SERVICES

FACILITY / LOCATION

TELEPHONE

Emergency Situation.....911

Sutter Davis Hospital

200 Sutter Place

Davis, CA 95616

(530) 756-6440

Direct Number to Emergency Room (530) 757-5111

Poison Control Center (800) 222-1222

Office of Emergency Services (Spill Prevention and Response) (800) 852-7550

USA Dig Alert of Northern California (800) 227-2600

WorkCare (Non-emergency) (888) 449-7787

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT D

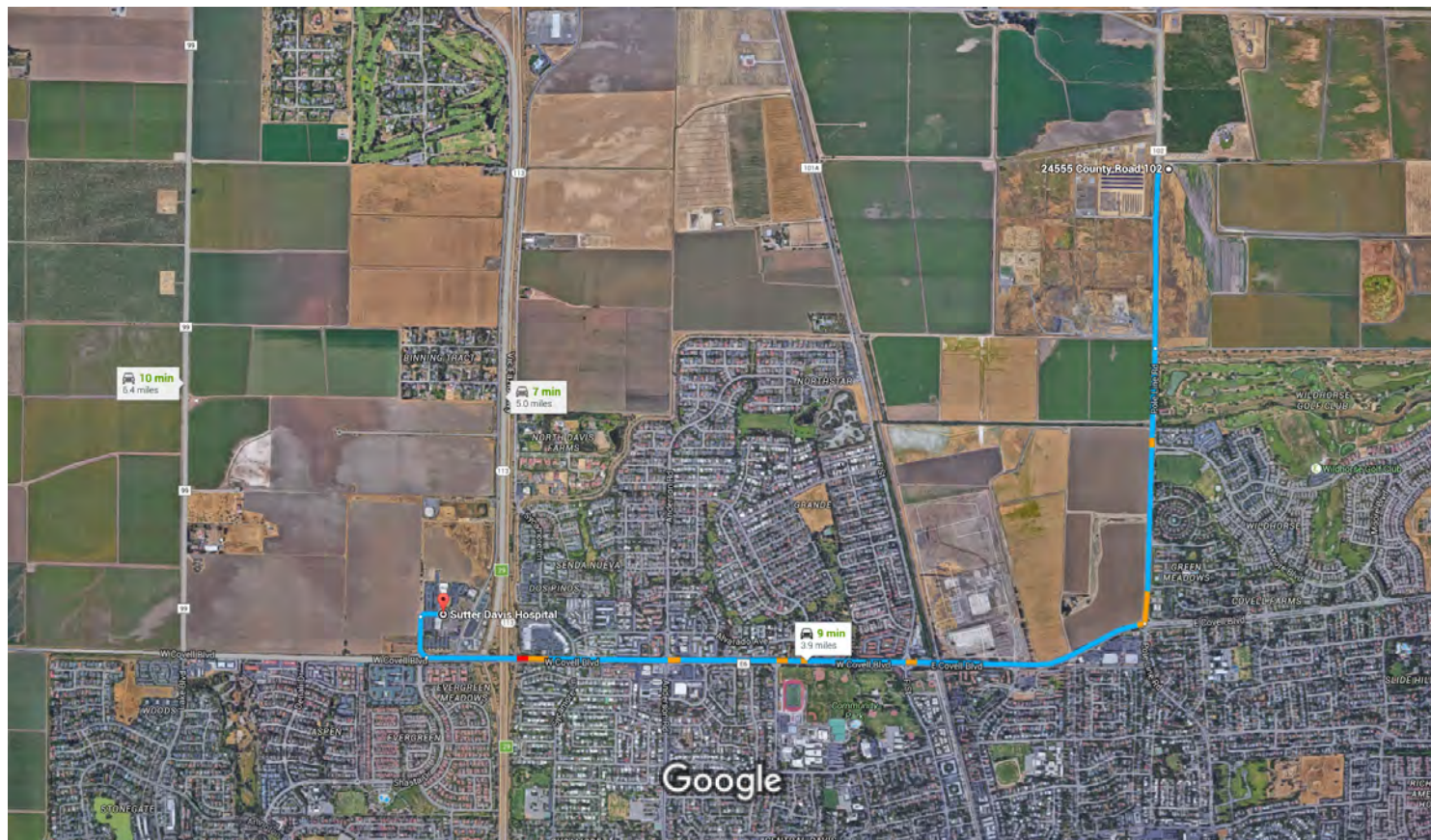
**LOCAL AREA MAP
with routes to hospital**



24555 County Road 102, Davis, CA 95618 to Sutter Davis Hospital

Drive 3.9 miles, 9 min


Main #: (530) 756-6440; Emergency Room: (530) 757-5111




Imagery ©2016 Google, Map data ©2016 Google 1000 ft

24555 County Road 102


Davis, CA 95618

- 


1. Head south on Co Rd 102

0.6 mi
- 


2. Continue onto Pole Line Rd

0.9 mi
- 

3. Turn right onto E Covell Blvd

2.2 mi
- 

4. Turn right onto Risling Ct

0.1 mi
- 

5. Risling Ct turns slightly right and becomes Sutter Pl

449 ft

Sutter Davis Hospital

2000 Sutter Place, Davis, CA 95616

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT E

JOB SAFETY ANALYSIS



Mob-Demob Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 7/11/16		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Mob-Demob		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE	
Tim Johnson	OSC	Corporate H&S		
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE	
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")				
<u> R </u> REFLECTIVE VEST <u> A </u> HARD HAT <u> R </u> GLOVES: ANSI Cut Level 4 <u> A </u> SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> A </u> HEARING PROTECTION <u> R </u> SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt.HARNES / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input checked="" type="checkbox"/> NA <u> </u> Dust Mask <u> </u> ½ face Air Purifying Respirator (APR) <u> </u> Particulate Mask: <input type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line		Additional PPE/Notes: As per defined in the job/site specific Health and Safety Plan (HASP) wear PPE at all times when performing site work.
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.				
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)		
1) Inspect vehicle and equipment prior to mobilizing to and from site	a. Vehicle failures.	a1. Inspect tires and lights regularly. a2. Inspect gas tank level. a3. Walk around vehicle and note any hazards with vehicle and report to the appropriate employee/supervisor.		
2) Loading/unloading at office or jobsite	a. Cut/pinched fingers or toes; and strained muscles. b. Vehicle parked in high traffic area.	a1. See PPE Quick Summary. a2. Use proper lifting techniques and 2-man rule as outlined in TRC's Employee IIPP Handbook when moving heavy objects (>40 lbs). b1. Make sure vehicle is parked in an area that limits the employee from crossing roads or intersections. b2. Use high-visibility cones around vehicle if need.		

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.		
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
3) Driving	a. Incidents. b. Flat tire/engine trouble.	a1. Adjust mirrors and be familiar with controls before driving vehicle. a2. Pay attention to the task at hand. a3. Avoid/defer cell phone until destination is reached (or while not driving). Take note of jurisdictional laws pertaining to cell phone usage. a4. Obey traffic laws and drive defensively. b1. If the problem requires you to stop the vehicle, make sure the vehicle is in a safe spot on the shoulder of the road. b2. Use flashers to alert other vehicles. b3. Only make repairs to the vehicle if the work can be done in a safe manner and away from traffic.
4) Arrival at site	a. Site conditions changed from plan.	a1. Observe traffic flow. a2. Modify traffic control plan if necessary. a3. Back into parking spots whenever possible. Employee spotter if available.
5) Inspect vehicle equipment	a. Vehicle failures.	a1. Inspect fluids, tires, connections and safety equipment regularly. a2. Inspect gas tank level. a3. Note any hazards with vehicle and report to the appropriate employee.
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1. Vehicle rolling: unattended.	a. When parked on slope or with engine idling.	a1. All large trucks should use chocks at all times when parking or leaving the vehicle unattended. a2. When parking on a hill or stopping with the engine idling, use parking brakes, parking gear if available, and use chocks immediately upon leaving the driver's compartment. If other personnel are available ask them do the chocking before the driver exits the vehicle, then the driver should double-check the chocks. a3. All towed trailers need chocking before disconnecting from main vehicle. a4. Vehicles with leveling jacks do not need chocks if the jacks are in use.

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute



Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 3/28/17	<input type="checkbox"/> NEW <input type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Excavation and Trench		List of Contractor(s) and key work activity:	
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE
Tim Johnson	OSC	Corporate Safety	
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE
Michelle Campbell		CIH	
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")			
<u> </u> R REFLECTIVE VEST <u> </u> R HARD HAT <u> </u> R GLOVES: Kevlar ANSI Cut Level 4 & 5 <u> </u> R SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> </u> A HEARING PROTECTION <u> </u> R SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt. HARNESS / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input type="checkbox"/> NA <u> </u> A <u> </u> ¾ face Air Purifying Respirator (APR) <u> </u> X Particulate Mask: <input type="checkbox"/> PM100 <input checked="" type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line	Additional PPE:
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.			
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)	
1) Set-Up Activities	a. Lack of concentration or focus. b. Fire and explosion. c. Electric shock/ electrocution. d. Malfunctioning heavy equipment safety devices.	a1. Review all plans (HASP, Work, Utility, Site Plans, etc.), logs, and field notes prior to starting a new task. Identify daily tasks and required personnel actions. a2. Conduct safety tailgate meeting with subcontractor personnel prior to beginning work activities. Explain the site safety hazards and work precautions outlined in the HASP and obtain signatures indicating the HASP was discussed. b1. No smoking or open flame. Periodically monitor ambient air concentrations with PID/LEL Meters. Shut down job and move personnel and equipment upwind if hydrocarbon concentrations are HASP defined action levels. b2. Deploy 2-20lb ABC Fire extinguishers in accordance site safety officer's direction. c1. Follow TRC's <u>CP023 Electric Power Transmission and Distribution Program</u> for minimum approach distances on cranes and excavators. d1. Inspect heavy equipment to determine if in good condition. Perform all equipment and safety device checks prior to event startup (per operating manual).	

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2) Excavation of Ash	<ul style="list-style-type: none"> a. Physical injury from falling or flying objects. b. Noise. c. Being struck by moving vehicles or equipment onsite. d. Cut/pinched fingers or toes; and strained muscles. e. Equipment tip over. f. Dust g. Slips, trips, and falls. h. Unauthorized personnel in exclusion zone. i. Cave-in 	<ul style="list-style-type: none"> a1. Stay out of the immediate excavation area and the excavator swing radius. a2. Wear appropriate PPE including hardhats, safety glasses, and any additional PPE as directed by the SSO. b1. All personnel will use hearing protection within work area while heavy machinery is operating >85dB. c1. Always wear at a minimum, Class II safety vest, establish eye with operators utilizing flag men wear appropriate. c2. Vehicles shall use reverse beepers or flagmen. c3. Create an exclusion zone at least 10-feet beyond the limits of the boring to limit access to staging/work area using snow fencing, barricades, delineators, cones and/or caution tape. c4. Face the direction of oncoming traffic during work activities when possible. d1. See PPE Quick Summary. d2. Use proper lifting techniques and 2-man rule as outlined in TRC's Manual Lifting Policy and "Back Safety: A User's Guide" training module", when moving heavy objects (>40 lbs). e1. Watch equipment location & swing points; monitor live & dead loads. e2. Use a crane that is adequate for the load (Check loading capacity with operator and manual). f1. Wet material while loading and during excavations f2. Suspend movement of material should winds exceed 25 mph. f3. Conduct personal air monitoring as detailed in HASP and don appropriate PPE. g1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area. h1. Use visitor check-in log and allow no-one in exclusion area without proper PPE (as defined on this JSA) and training documentation (e.g., HAZWOPER, other as defined in the HASP). i1. Follow TRC's <u>CP024 Excavation and Trench Program</u>. i2. Never enter an excavation without the proper training, and a competent person documenting and monitoring the excavation.

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.		
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
3) Staging and Dumping of Ash	a. Bad organization creating confusion and hazard. b. Bad organization causing cross-contamination of ash, water, or personnel.	a1. Identify staging area, clearly mark and keep area clear of parked vehicles or stored materials/equipment. a2. Identify truck ingress/egress lanes and keep clear. a3. Clear stockpile area (including overhead obstructions) so that loader bucket doesn't impact a surface appurtenance or overhead line. a4. Identify staging area with good lateral and vertical access for loading and unloading of trucks. b1. Waste management—Identify and delineate soil stockpile area. b2. Blot up puddles of standing water and the work area will be swept.
4) Clean-Up	a. Slips, trips, and falls. b. Storm water run-off.	a1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area. b1. Cover all soil stockpiles with plastic-sheeting overnight to contain storm water run-off. b2. Delineate and block access to open pits/trenches with snow-fencing, delineators, and caution tape. b3. Cover open trenches with plastic sheet and berm around to reduce water run-off in the case of rain.
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute

Field Notes:

LIMITATION: As part of TRC's EAP a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSAs may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EAP; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.



Soil/Debris Loading Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 3/28/17		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Ash Loading		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE	
Tim Johnson	OSC	Corporate Safety		
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE	
Michelle Campbell		CIH		
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")				
<u> R </u> REFLECTIVE VEST <u> R </u> HARD HAT <u> R </u> GLOVES: ANSI Cut Level 4 & 5 Kevlar <u> R </u> SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> A </u> HEARING PROTECTION <u> R </u> SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt. HARNESS / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input type="checkbox"/> NA <u> A </u> ½ face Air Purifying Respirator (APR) <u> X </u> Particulate Mask: <input checked="" type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line		Additional PPE:
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.				
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)		
1) Set-up Activities	a. Lack of concentration or focus. b. Fire and explosion. c. Malfunctioning heavy equipment safety devices.	a1. Review all plans (HASP, Work, Utility, Site Plans, etc.), logs, and field notes prior to starting a new task. Identify daily tasks and required personnel actions. a2. Conduct safety tailgate meeting with subcontractor personnel prior to beginning work activities. Explain the site safety hazards and work precautions outlined in the HASP and obtain signatures indicating the HASP was discussed. b1. No smoking or open flame. Periodically monitor ambient air concentrations with PID/LEL Meters. Shut down job and move personnel and equipment upwind if hydrocarbon concentrations are HASP defined action levels. c1. Inspect heavy equipment to determine if in good condition. Perform all equipment and safety device checks prior to event startup (per operating manual).		

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2) Staging Ash	<ul style="list-style-type: none"> a. Bad organization creating confusion and hazard. b. Physical injury from falling or flying objects. c. Noise. d. Being struck by moving vehicles or equipment onsite. e. Equipment tip over. f. Dust g. Slips, trips, and falls. h. Unauthorized personnel in exclusion zone. 	<ul style="list-style-type: none"> a1. Identify staging area with good lateral and vertical access for loading and unloading of trucks. b1. Always conduct Safe Performance Self-Assessment (SPSA) prior to start of, or change in each work procedure or task. b2. Wear appropriate PPE including hardhats, safety glasses, and any additional PPE as directed by the SSO. c1. All personnel will use hearing protection within work area while heavy machinery is operating at >85 dB. d1. Always wear safety vest, establish eye contact with operators utilizing flag men wear appropriate. d2. Vehicles shall use reverse beepers or flagmen. d3. Create an exclusion zone at least 10-feet beyond the limits of the boring to limit access to staging/work area using snow fencing, barricades, delineators, cones and/or caution tape. d4. Face the direction of oncoming traffic during work activities when possible. e1. Watch equipment location & swing points; monitor live & dead loads. f1. Wet material while loading and during excavations f2. Suspend movement of material should winds exceed 25 mph. f3. Conduct personal air monitoring as detailed in HASP and don appropriate PPE. g1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area. h1. Use visitor check-in log and allow no-one in exclusion area without proper PPE (as defined on this JSA) and training documentation (e.g., HAZWOPER, other as defined in the HASP).
3) Loading of Ash	<ul style="list-style-type: none"> a. Physical injury from falling or flying objects. b. Noise. 	<ul style="list-style-type: none"> a1. Always conduct Safe Performance Self-Assessment (SPSA) prior to start of, or change in each work procedure or task. a2. Wear appropriate PPE including hardhats, safety glasses, and any additional PPE as directed by the SSO. b1. All personnel will use hearing protection within work area while heavy machinery is operating at >85 dB.



Soil/Debris Loading Job Safety Analysis (JSA)

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
3) Cont'd	<p>c. Being struck by moving vehicles or equipment onsite.</p> <p>d. Cut/pinched fingers or toes; and strained muscles.</p> <p>e. Equipment tip over.</p> <p>f. Dust</p> <p>g. Slips, trips, and falls.</p> <p>h. Unauthorized personnel in exclusion zone.</p>	<p>c1. Always wear safety vest, establish eye contact with operators utilizing flag men wear appropriate.</p> <p>c2. Vehicles shall use reverse beepers or flagmen.</p> <p>c3. Create an exclusion zone at least 10-feet beyond the limits of the boring to limit access to staging/work area using snow fencing, barricades, delineators, cones and/or caution tape.</p> <p>c4. Face the direction of oncoming traffic during work activities when possible.</p> <p>d1. See PPE Quick Summary.</p> <p>d2. Use proper lifting techniques and 2-man rule as outlined in TRC's Employee IIPP Handbook and "Back Safety: A User's Guide" training module" handbook, when moving heavy objects (>40 lbs).</p> <p>e1. Watch equipment location & swing points. Monitor live & dead loads adjacent to the excavation.</p> <p>e2. Maintain 2-foot safety buffer at edge of excavation.</p> <p>f1. Wet material while loading and during excavations</p> <p>f2. Suspend movement of material should winds exceed 25 mph.</p> <p>f3. Conduct personal air monitoring as detailed in HASP and don appropriate PPE</p> <p>g1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area.</p> <p>h1. Use visitor check-in log and allow no-one in exclusion area without proper PPE (as defined on this JSA) and training documentation (e.g., HAZWOPER, other as defined in the HASP).</p>
4) Clean-up	<p>a. Slips, trips, and falls.</p> <p>b. Storm water run-off.</p>	<p>a1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area.</p> <p>b1. Cover all impacted spoils piles and berm to contain storm water run-off.</p>
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute



Soil/Debris Loading Job Safety Analysis (JSA)

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.



Backfilling and Compaction Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 12/9/16		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Backfilling and Compaction		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE	
Tim Johnson	OSC	Corporate Safety		
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE	
Michelle Campbell		CIH		
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")				
<input type="checkbox"/> R REFLECTIVE VEST <input type="checkbox"/> R HARD HAT <input type="checkbox"/> R GLOVES: ANSI Cut Level 4 & 5 Kevlar <input type="checkbox"/> R SAFETY GLASSES <input type="checkbox"/> GOGGLES <input type="checkbox"/> FACE SHIELD	<input type="checkbox"/> A HEARING PROTECTION <input type="checkbox"/> R SAFETY SHOES: <u>Protective Toe</u> <input type="checkbox"/> 5pt. HARNESS / LANYARD PPE CLOTHING: <input type="checkbox"/> Coveralls <input type="checkbox"/> Tyvek Suit <input type="checkbox"/> Nomex <input type="checkbox"/> Other (specify):	RESPIRATORY PROTECTION: <input type="checkbox"/> NA <input type="checkbox"/> Dust Mask <input type="checkbox"/> A ½ face Air Purifying Respirator (APR) <input checked="" type="checkbox"/> Particulate Mask: <input checked="" type="checkbox"/> PM100 <input type="checkbox"/> PM95 <input type="checkbox"/> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <input type="checkbox"/> Full face ARP; specify cartridge type: <input type="checkbox"/> Air Supplied Respirator <input type="checkbox"/> SCBA <input type="checkbox"/> Air-line	Additional PPE:	
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.				
¹ JOB TASKS		² POTENTIAL HAZARDS		
³ HAZARD CONTROLS (beyond wearing "Required" PPE)				
1) Set-up Activities Backhoe/ Excavator (Compactor & Material Delivery)	a. Lack of concentration or focus. b. Fire and explosion. c. Malfunctioning heavy equipment safety devices.	a1. Review all plans (HASP, Work, Utility, Site Plans, etc.), logs, and field notes prior to starting a new task. Identify daily tasks and required personnel actions. a2. Conduct safety tailgate meeting with subcontractor personnel prior to beginning work activities. Explain the site safety hazards and work precautions outlined in the HASP and obtain signatures indicating the HASP was discussed. b1. No smoking or open flame. Periodically monitor ambient air concentrations with PID/LEL Meters. Shut down job and move personnel and equipment upwind if hydrocarbon concentrations are HASP defined action levels. b2. Deploy 2-20lb ABC Fire extinguishers in accordance site safety officer's direction. c1. Inspect equipment to determine if in good condition. Perform all equipment and safety device checks prior to event startup (per operating manual).		



Backfilling and Compaction Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 12/9/16	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Backfilling and Compaction		List of Contractor(s) and key work activity:	
1) Cont'd	e. Being struck by moving vehicles or equipment onsite.	e1. Always wear safety vest, establish eye contact with operators utilizing flag men wear appropriate. e2. Vehicles shall use reverse beepers or flagmen. e3. Create an exclusion zone at least 10-feet beyond the limits of the boring to limit access to staging/work area using snow fencing, barricades, delineators, cones and/or caution tape. e4. Face the direction of oncoming traffic during work activities when possible.	
2) Compacting Soil	f. Bad organization creating confusion and hazard. a. Physical injury from equipment. b. Physical injury from falling or flying objects. c. Being struck by moving vehicles or equipment onsite. d. Poor or miscommunications. e. Cut/pinched fingers or toes; and strained muscles.	f1. Identify staging area with good lateral and vertical access for loading and unloading of trucks. a1. Wear appropriate safety vest and keep appropriate distance when working around moving equipment. b1. Always conduct Safe Performance Self-Assessment (SPSA) prior to start of, or change in each work procedure or task. b2. Wear appropriate PPE including hardhats, safety glasses, and any additional PPE as directed by the SSO. c1. Always wear safety vest, establish eye contact with operators utilizing flag men wear appropriate. c2. Vehicles shall use reverse beepers or flagmen. c3. Create an exclusion zone at least 10-feet beyond the limits of the boring to limit access to staging/work area using snow fencing, barricades, delineators, cones and/or caution tape. c4. Face the direction of oncoming traffic during work activities when possible. d1. Review and use hazard communications contained HASP to prepare for working in loud or hazardous environment. e1. See PPE Quick Summary. e2. Use proper lifting techniques and 2-man rule as outlined in TRC's Manual Lifting Policy and "Back Safety: A User's Guide" training module", when moving heavy objects (>40 lbs).	



Backfilling and Compaction Job Safety Analysis (JSA)

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2) Compacting Soil (cont'd)	f. Noise. g. Back strain, muscle fatigue objects. h. Dust	f1. All personnel will use hearing protection within work area while heavy machinery is operating at >85 dB. g1. Use proper lifting techniques and 2-man rule when moving heavy objects (>40 lbs). g2. When hand digging, use the leverage in the shovel handle to break the soil loose, and don't force it out. h1. Wet material while loading and during excavations h2. Suspend movement of material should winds exceed 25 mph. h3. Conduct personal air monitoring as detailed in HASP and don appropriate PPE.
3) Clean-up and Overnight/Over Weekend Storage	a. Slips, trips, and falls. b. Bad organization creating confusion and hazard. c. Run-off.	a1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area. b1. Identify staging area with good lateral and vertical access for loading and unloading of trucks. c1. Cover all soil stockpiles with plastic-sheeting overnight. c2. Delineate and block access to open pits/trenches with snow-fencing, delineators, and caution tape. c3. Cover open trenches with plastic sheet and berm around to reduce water run-off in the case of rain.
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute



Backfilling and Compaction Job Safety Analysis (JSA)

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.



Cold Illness Prevention Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 12/9/16		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Cold Illness Prevention		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE	
Tim Johnson	OSC	Corporate Safety		
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE	
John Nordenstam		Senior Project Geologist		
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")				
<u> </u> R REFLECTIVE VEST <u> </u> R HARD HAT <u> </u> R GLOVES: ANSI Cut Level 4 & 5 Kevlar <u> </u> R SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> </u> R HEARING PROTECTION <u> </u> R SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt. HARNESS / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input checked="" type="checkbox"/> NA <u> </u> Disposable Particulate Respirator (N95) <u> </u> ½ face Air Purifying Respirator (APR) <u> </u> Particulate Mask: <input type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line	Additional PPE/Notes:	
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.				
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)		
1) Working in wind chill temperatures > 30 to < 65 degrees F	a. Trench foot.	a1. Avoid having feet immersed in cold water at temperatures above freezing for long periods. a2. Avoid continuous exposure to a wet, cold environment, or actual immersion in water. a3. Take frequent short-breaks in warm dry shelters—self paced. a4. Perform work during the warmest part of the day. a5. Keep a change of clothing available in case work clothes becomes wet. Maintain a dry environment within the shoe. a6. Rotate your shoes every other day to allow them to dry thoroughly. a7. Avoid synthetic materials like rubber or vinyl, wear leather or cloth that can absorb moisture.		



Cold Illness Prevention Job Safety Analysis (JSA)

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.		
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2) Working in temperatures < 30 degrees F or wind chill effects above freezing temperatures	a. Frost bite.	a1. Proper insulation (layered clothing to adjust to changing environmental temperatures). Keep clothing as dry as possible. a2. Perform work during the warmest part of the day. a3. Take frequent short-breaks in warm dry shelters-self paced. a4. Avoid exhaustion and fatigue because energy is needed to keep the muscles warm. a5. Use the "Buddy System" for working outdoors.
3) Working in temperatures above freezing > 30 degrees	a. Hypothermia.	a1. Proper insulation (layered clothing to adjust to changing environmental temperatures). Keep clothing as dry as possible. a2. Perform work during the warmest part of the day. a3. Take frequent short-breaks in warm dry shelters-self paced. a4. Pay special attention to protecting feet, hands, face, and head. Up to 40% of body heat can be lost when the head is exposed.
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1. Frost bite	a. Skin first turns red, then purple, later becomes pale, then waxy-white and is cold to the touch. b. Skin of body part affected becomes hard, cold, stinging or aching followed by numbness; affecting nose, ears, cheeks, forehead, wrists, toes and fingers.	a1. Unless the frostbite was very mild, call for emergency for special instructions. a2. A worker with warm hands may help thaw other's worker hands or fingers merely by enclosing them within the palms and exerting a very gentle pressure. a3. Try to elevate worker extremity to improve blood circulation. b1. Act immediately, call for emergency. Move the worker to a warm area. Do not leave the worker alone. b2. Remove any wet or tight clothing that may cut off blood flow to the affected area and DO NOT RUB affected area.

LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2. Hypothermia	<ul style="list-style-type: none"> a. Uncontrolled shivering. b. Cool bluish skin. c. Dry tongue and thirst. d. Slurred speech. e. Clumsy movements, irritable, irrational or confused behavior. 	<ul style="list-style-type: none"> a1. Act immediately—Call for Emergency. a2. Move the victim to a warm, dry area. Do not leave the person alone and DO NOT RUB the person's body. b1. Loosen and remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets. c1. Administer warm, sweet drinks (sugar water or sports-type drinks) if victim is alert. d1. Have the victim move their arms and legs to create muscle heat. e1. Place warm bottles or hot packs in the arm pits, groin, neck, and head areas. Encourage the person to rest. e2. Monitor closely.
3. Trench foot	<ul style="list-style-type: none"> a. Initially appears wet, soggy, white, shriveled. b. Sensations of pins and needles, tingling, numbness and then pain. c. Skin discoloration. Affected portions of foot and toes can appear gray and blotchy. d. Becomes cold, swollen, and waxy appearance. e. May develop blisters, open weeping or bleeding in more extreme cases. 	<ul style="list-style-type: none"> a1. Move individual with trench foot to a warm, dry area. a2. Rewarm by exposing to warm air. b1. Rewarm by exposing to warm air. b2. Seek medical assistance as soon as possible. c1. Seek medical assistance as soon as possible. d1. Seek medical assistance as soon as possible. d2. Elevate feet to reduce swelling. e1. Seek medical assistance as soon as possible. e2. DO NOT break blisters, apply lotions, massage, expose to heat, or allow to walk on injury.



Cold Illness Prevention Job Safety Analysis (JSA)

Field Notes:

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Heavy Equipment and/or Vehicles Job Safety Analysis (JSA)

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC /Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 7/11/16	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Heavy Equipment and/or Vehicles		List of Contractor(s) and key work activity:	
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE
Tim Johnson	OSC	Corporate H&S	
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")			
<u> R </u> REFLECTIVE VEST <u> R </u> HARD HAT <u> R </u> GLOVES: ANSI Cut Level 4 <u> R </u> SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> A </u> HEARING PROTECTION <u> R </u> SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt. HARNESS / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input checked="" type="checkbox"/> NA <u> </u> Dust Mask <u> </u> ½ face Air Purifying Respirator (APR) <u> </u> Particulate Mask: <input type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> <u> </u> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line	Additional PPE:
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.			
¹ JOB TASKS		² POTENTIAL HAZARDS	
³ HAZARD CONTROLS (beyond wearing "Required" PPE)			
1) Set-up Activities	a. Lack of concentration or focus. b. Fire c. Malfunctioning heavy equipment safety devices.	a1. Review all plans (HASP, Work, Utility, Site Plans, etc.), logs, and field notes prior to starting a new task. Identify daily tasks and required personnel actions. a2. Conduct safety tailgate meeting with subcontractor personnel prior to beginning work activities. Explain the site safety hazards and work precautions outlined in the HASP and obtain signatures indicating the HASP was discussed. b1. No smoking or open flame. b2. Deploy 2-20lb ABC Fire extinguishers in accordance site safety officer's direction. c1. Check with subcontractor to make sure equipment has been inspected to determine if in good condition. Perform all equipment and safety device checks prior to event startup (per operating manual).	



Heavy Equipment and/or Vehicles Job Safety Analysis (JSA)

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.

Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
2) Heavy Equipment and/or Vehicles	<ul style="list-style-type: none">a. Physical injury from falling or flying objects.b. Noise.c. Being struck by moving vehicles or equipment onsite.d. Cut/pinched fingers or toes; and strained muscles.e. Equipment tip over.f. Slips, trips, and falls.g. Dust.h. Unauthorized personnel in exclusion zone.	<ul style="list-style-type: none">a1. Always conduct Safe Performance Self-Assessment (SPSA) prior to start of, or change in each work procedure or task.a2. Wear appropriate PPE including hardhats, safety glasses, and any additional PPE as directed by the SSO.b1. All personnel will use hearing protection within work area while heavy machinery is operating at >85 dB.c1. Always wear safety vest, establish eye contact with operators utilizing flag men wear appropriate.c2. Vehicles shall use reverse beepers or flagmen.c3. Face the direction of oncoming traffic during work activities when possible.d1. See PPE Quick Summary.d2. Use proper lifting techniques and 2-man rule as outlined in TRC's Manual Lifting Policy and "Back Safety: A User's Guide" training module", when moving heavy objects (>40 lbs).e1. Watch equipment location & swing points; monitor live & dead loads.f1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area.g1. Identify the wind direct and try to stay up wind at all times.h1. Use visitor check-in log and allow no-one in exclusion area without proper PPE (as defined on this JSA) and training documentation (e.g., HAZWOPER, other as defined in the HASP).
3) Clean-Up	<ul style="list-style-type: none">a. Slips, trips, and falls.	<ul style="list-style-type: none">a1. Maintain a clean, unobstructed work area by good housekeeping and placing unused equipment away from work area.



Heavy Equipment and/or Vehicles Job Safety Analysis (JSA)


Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

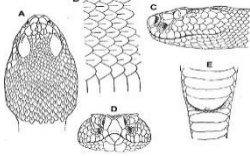

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HASP: 7/11/16		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED
JSA WORK ACTIVITY (Description): Hazardous Wildlife Awareness		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE	
Tim Johnson	OSC	Corporate H&S		
TRC HEALTH AND SAFETY MANAGEMENT		POSITION / TITLE	APPROVAL DATE	
PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY				
Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")				
R REFLECTIVE VEST R HARD HAT R GLOVES ANSI CutLevel 4 R SAFETY GLASSES GOGGLES FACE SHIELD	HEARING PROTECTION R SAFETY SHOES: <u>Protective Toe</u> Spt.HARNESS / LANYARD PPE CLOTHING: Coveralls Tyvek Suit Nomex R Other (specify): Long pants and socks.	RESPIRATORY PROTECTION: <input checked="" type="checkbox"/> NA ½ face Air Purifying Respirator (APR) Cartridge: <input type="checkbox"/> P100-Multigas <input type="checkbox"/> Full face ARP; specify cartridge type: Air Supplied Respirator SCBA Air-line		Additional PPE: Snake Guard Shields (if appropriate)
Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.				
¹ JOB TASKS	² POTENTIAL HAZARDS		³ HAZARD CONTROLS (beyond wearing "Required" PPE)	
1) Working within arid regions with tall grass or shrubs	a. Ticks. 		a1. Wear pants, long-sleeved shirt and socks to reduce the chance of exposure to tick bites. a2. Avoid walking through areas with tall grass if possible. a3. During work breaks, check body for ticks (especially extremities, underarms, and around your ears). a4. If a tick is discovered and has already attached itself to the skin, use fine-tipped tweezers or a tick removal kit to safely remove the tick (see illustration to the left). If the proper tools are not available, seek medical attention to safely remove the tick.	

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.
Focus on each new task, procedures, and skill sets to be used.

¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1) Cont'd	b. Rattlesnakes. 	b1. Wear steel-toed boots with ankle support. If working in an area with known rattlesnake activity (signage posted), consider wearing snake guard shields to extend additional protection to shins and lower leg. b2. Watch your step; do a visual inspection near bushes or rocks to verify that an area is clear of any snakes before proceeding with work. b3. Stay alert; if the distinctive rattle sound from the tail of a rattlesnake is heard, evacuate the area as soon as possible. b4. If an unidentified snake is encountered, assume it is poisonous/hazardous and remain at least 10 feet away from it. Wait until the snake has moved on to continue work in that area.
2) Work within wooded areas with dense vegetation	a. Poisonous plants (Oak, Sumac, and Ivy). 	a1. Wear gloves, long-sleeved shirt, pants, socks and steel-toed boots when working in densely vegetated areas. Limiting direct dermal contact with poisonous plants is the best way to prevent injury. a2. Be aware of your surroundings, try to identify poisonous plants by their leaf patterns (shown to the left) and avoid areas where these plants are prevalent. a3. After work is complete, be sure to remove PPE and protective clothing and wash/shower body parts with soap and water to remove any plant oil that may have come in contact with skin. a4. Workers who come in contact with an identified poisonous plant should immediately rinse skin with rubbing alcohol or degreasing soap/detergent and copious amounts of water. Apply wet compresses and/or calamine lotion to skin to reduce itching and blistering. a5. Call WorkCare (888-449-7787) immediately once you see a rash and apply Zanol. a6. For severe allergic reactions to plant contact, call 911 to activate EMS for immediate medical attention.
LOCATION(S) WHERE HAZARD IS TO BE EXPECTED		³ HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

PID—photoionization detector; LEL—lower explosive limit; PPE—Personal Protective Equipment; ANSI—American National Standards Institute



Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HSP: 3/28/17	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED from S: Drive
JSA WORK ACTIVITY (Description): Heat Illness Prevention		List of Contractor(s) and key work activity:	
SITE SPECIFIC JSA AUTHOR Tim Johnson	POSITION / TITLE OSC	DEPT Corproat e Safety	SIGNATURE
"TRC APPROVED" JSA DEVELOPMENT TEAM		POSITION / TITLE	APPROVAL DATE
Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")			
<u> R </u> REFLECTIVE VEST <u> A </u> HARD HAT <u> R </u> GLOVES: ANSI Cut Level 2,3, 4 or 5 Kevlar <u> R </u> SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> A </u> HEARING PROTECTION <u> R </u> SAFETY SHOES: Protective Toe <u> </u> 5pt. HARNESS / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input type="checkbox"/> NA <u> A </u> Disposable Particulate Respirator (N95) <u> A </u> ½ face Air Purifying Respirator (APR) <u> X </u> Particulate Mask: <input checked="" type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> X </u> Cartridge: <input checked="" type="checkbox"/> P100- Multigas <input type="checkbox"/> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line	Additional PPE:
Always perform a Safety Assessment: 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.			
¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)	
1. Working in temperatures > 80 to < 90 degrees F	a. Heat Cramps b. Heat Exhaustion c. Heat Stroke	a. Fluids mandatory every 60 minutes b. Rest breaks - self paced by time period worked c. Cool Device (bandana, headband, hardhat insert, poncho, etc.) – optional d. H.E.A.T. Kit with Heat Illness supplies.	
1. Working in temperatures > 90 to < 100 degrees F	a. Heat Cramps b. Heat Exhaustion c. Heat Stroke	a. Fluids mandatory every 60 minutes b. Rest breaks - self paced c. Cool Device - optional d. H.E.A.T. Kit with Heat Illness supplies.	
1. Working in temperatures > 100 degrees F	a. Heat Cramps b. Heat Exhaustion c. Heat Stroke	a. Fluids mandatory every 30 minutes b. Rest Breaks mandatory every 30 minutes c. Implement as least one of the following: <ul style="list-style-type: none"> • External Cool Device (AC) • Personal Cool Device (Cool Vest) • Rotate personnel, buddy system/add to work team d. Plan work at cooler time of day e. Contact supervisor frequently to give status reports. f. H.E.A.T. Kit with Heat Illness supplies.	
GENERAL SAFETY HAZARDS	LOCATION(S) WHERE HAZARD IS TO BE EXPECTED	³ HAZARD CONTROLS (beyond wearing "Required" PPE)	
1. Heat Cramps	a. Muscles most often affected include calves, arms, abdomen and back	a. Start slowly b. Stretch before working out c. Rest briefly and cool down d. Do range-of-motion stretching and massage of the affected muscle group e. Drink water or sports drinks	
2. Heat Exhaustion	a. Cool, clammy and pale skin b. Profuse sweating c. Dry tongue and thirst d. Severe muscle fatigue, weakness e. Mood changes (e.g., confusion or inability to	a. Act immediately – May lead to heat exhaustion, stroke or death. b. Move the victim to a cool, shaded area to rest. c. Loosen and remove any heavy clothing. d. Administer cool water (about a cup every 15 minutes) unless sick to the stomach. e. If symptoms continue (e.g., dizziness or lightheadedness), lay the victim on his/her back and raise the legs 6 to 8 inches.	

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HSP: 3/28/17	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED from S: Drive
JSA WORK ACTIVITY (Description): Heat Illness Prevention		List of Contractor(s) and key work activity:	
	think straight and rapid pulse) f. Feeling weak, faint or dizzy with headache or nausea g. Loss of appetite h. Physical collapse and sometimes cramping i. Decreased or dark-colored urine	- If nausea or upset stomach exists, lay the person on his/her side. f. Cool the person's body by fanning, spraying with a cool mist of water, sponging with cool water and/or applying cool, wet cloths for an evaporative effect. g. Encourage the person to rest. h. Monitor closely. i. Obtain emergency medical care if condition does not improve.	
3. Heat Stroke	a. Very high temperature (104 degrees F or higher) b. Hot, dry, red skin c. Not sweating d. Deep breathing and fast pulse - Shallow breathing and weak pulse e. Dilated pupils f. Convulsions g. Loss of consciousness	a. Act immediately – inaction may lead to death or brain damage b. OBTAIN EMERGENCY MEDICAL CARE! c. Cool the individual as rapidly as possible: <ul style="list-style-type: none"> - Move victim to cool, shaded area. - Remove clothing - Spray with water - Fan - Apply cool, wet sheets - ice packs to groin, underarms, and neck 	

Regardless of the Advisory Level, the following factors need to be considered:

Humidity

Medications that affect heat tolerance (diuretics, beta-blockers, antihistamines, antidepressants)

Lack of acclimatization (conditioning)

Obesity or other personnel medical issues (personal illnesses or disease)

History of previous heat-related disorders

Physical conditioning

Field Notes:

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JSA WORK ACTIVITY (Description): Heat Illness Prevention		List of Contractor(s) and key work activity:		
SITE SPECIFIC JSA AUTHOR		POSITION / TITLE		DEPT
Tim Johnson		OSC		Corporate H&S
"TRC APPROVED" JSA DEVELOPMENT TEAM		POSITION / TITLE		APPROVAL DATE
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<u> R </u> REFLECTIVE VEST <u> A </u> HARD HAT <u> R </u> GLOVES: ANSI Cut Level 2,3, 4 or 5 Kevlar <u> R </u> SAFETY GLASSES <u> </u> GOGGLES <u> </u> FACE SHIELD	<u> A </u> HEARING PROTECTION <u> R </u> SAFETY SHOES: <u>Protective Toe</u> <u> </u> 5pt.HARNES / LANYARD PPE CLOTHING: <u> </u> Coveralls <u> </u> Tyvek Suit <u> </u> Nomex <u> </u> Other (specify):	RESPIRATORY PROTECTION: <input checked="" type="checkbox"/> NA <u> </u> Disposable Particulate Respirator (N95) <u> </u> ½ face Air Purifying Respirator (APR) <u> </u> Particulate Mask: <input type="checkbox"/> PM100 <input type="checkbox"/> PM95 <u> </u> Cartridge: <input type="checkbox"/> P100- Multigas <input type="checkbox"/> <u> </u> <u> </u> Full face ARP; specify cartridge type: <u> </u> Air Supplied Respirator <u> </u> SCBA <u> </u> Air-line		Additional PPE:
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¹ JOB TASKS	² POTENTIAL HAZARDS	³ HAZARD CONTROLS (beyond wearing "Required" PPE)		
1. Working in temperatures > 80 to < 90 degrees F	a. Heat Cramps b. Heat Exhaustion c. Heat Stroke	a. Fluids mandatory every 60 minutes b. Rest breaks - self paced by time period worked c. Cool Device (bandana, headband, hardhat insert, poncho, etc.) – optional d. H.E.A.T. Kit with Heat Illness supplies.		
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2. Heat Exhaustion	a. Cool, clammy and pale skin b. Profuse sweating c. Dry tongue and thirst d. Severe muscle fatigue, weakness e. Mood changes (e.g., confusion or inability to think straight and rapid	a. Act immediately – May lead to heat exhaustion, stroke or death. b. Move the victim to a cool, shaded area to rest. c. Loosen and remove any heavy clothing. d. Administer cool water (about a cup every 15 minutes) unless sick to the stomach. e. If symptoms continue (e.g., dizziness or lightheadedness), lay the victim on his/her back and raise the legs 6 to 8		

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State) TRC/ Lillard Ranch Site (Davis, CA)		DATE PREPARED FOR HSP: 7/11/16	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED from S: Drive
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	pulse) f. Feeling weak, faint or dizzy with headache or nausea g. Loss of appetite h. Physical collapse and sometimes cramping i. Decreased or dark-colored urine	inches. - If nausea or upset stomach exists, lay the person on his/her side. f. Cool the person's body by fanning, spraying with a cool mist of water, sponging with cool water and/or applying cool, wet cloths for an evaporative effect. g. Encourage the person to rest. h. Monitor closely. i. Obtain emergency medical care if condition does not improve.	
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Regardless of the Advisory Level, the following factors need to be considered:

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Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT F

PRE-JOB SAFETY BRIEFING



Daily Pre Job Safety Briefing

Project Name: Lillard Ranch Site Project Number: 245981.0000
Work Location: Country Road 102 Date: _____
Tasks Performed: Ash Excavation Oversight Time: _____ AM PM
Client Name: DTE Submitted By: _____

Health and Safety Plan Available Onsite: Yes ☐ No ☐ Emergency Meeting Location(s): _____
Emergency Facility(s): _____ Number(s): _____
Physical Address: _____
First Aid/CPR Persons: _____

For Emergencies Dial 911/For Non-Emergencies Dial WorkCare (888) 449-7787

Personal Protective Equipment Required			Procedures/Programs Required	Yes	No	Additional Considerations	
	Yes	No	Type				
Fall Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____	Hot Work	<input type="checkbox"/>	<input type="checkbox"/>	Work Procedures:
body harness, lifelines, barricades, other (specify)				LOTO/Energy Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Check for utility clearance <input type="checkbox"/> Adequate work zone
Eye/Face	<input type="checkbox"/>	<input type="checkbox"/>	_____	Trenching/Excavation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Vehicle grounds <input type="checkbox"/> Working clearances
goggles, face shield, hood, other (specify)				Signs/Barricades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Discuss potential exposure to hazards
Respirator	<input type="checkbox"/>	<input type="checkbox"/>	_____	Confined Space	<input type="checkbox"/>	<input type="checkbox"/>	People: <input type="checkbox"/> Worker fatigue <input type="checkbox"/> Other work groups
SCBA, supplied air, HEPA, dust, other (specify)				Cranes/Critical Lifts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Public safety <input type="checkbox"/> Pedestrian control <input type="checkbox"/> Experience
Foot Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____	Line Breaking/Hot Tap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Traffic control <input type="checkbox"/> Other utilities <input type="checkbox"/> Spec. Training
safety toe, EH rated, rubber boots, other (specify)				Scaffolds/Aerial Lifts	<input type="checkbox"/>	<input type="checkbox"/>	Tools/Equipment: <input type="checkbox"/> Inspection of drilling equipment
Hand Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____	System Testing/ Grounding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Inspection of hoses
leather, cut resistant, chemical, EH, other (specify)				Employee Certification/Training Required			<input type="checkbox"/> Inspection of tools
Head Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____	Crane Operator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Specialized tools/equipment
hard hat, helmet, electrical hazard, other (specify)				Forklift Operator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Correct tool/equipment for the job
Clothing	<input type="checkbox"/>	<input type="checkbox"/>	_____	Mobile Equipment Operator	<input type="checkbox"/>	<input type="checkbox"/>	Special Precautions: <input type="checkbox"/> Adjacent structures
coveralls, welding, sleeves, rain, FR, reflective vest,				Railroad/eRailsafe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Condition of structures <input type="checkbox"/> Weather conditions
chemical, other (specify)				OSHA 10/30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Lighting conditions <input type="checkbox"/> Terrain <input type="checkbox"/> Water bodies
Hearing Protection	<input type="checkbox"/>	<input type="checkbox"/>	_____	HAZWOPER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Spills and leaks <input type="checkbox"/> Environmental <input type="checkbox"/> Cultural
				MSHA	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____

If Conditions CHANGE...Stop Work, Review, and Revise the Plan!!

Daily Pre Job Safety Briefing

Hazards Associated with the Job (focus on the GEMS)				
Gravity	Electrical	Mechanical	Kinetic	Other/Environmental
<input type="checkbox"/> Falling from a height <input type="checkbox"/> Falling objects <input type="checkbox"/> Falling structures <input type="checkbox"/> Climbing obstructions <input type="checkbox"/> Dangerous trees	<input type="checkbox"/> Electrical contact <input type="checkbox"/> Flash potential <input type="checkbox"/> Induced voltage <input type="checkbox"/> Utility strike	<input type="checkbox"/> Equipment failure <input type="checkbox"/> Cable tension <input type="checkbox"/> Moving parts <input type="checkbox"/> Crane/Rigging	<input type="checkbox"/> Traffic <input type="checkbox"/> Driving conditions <input type="checkbox"/> Moving/Shifting loads <input type="checkbox"/> Rotating machinery <input type="checkbox"/> Vehicle stability <input type="checkbox"/> Heavy equip. operation	<input type="checkbox"/> Asbestos/Lead <input type="checkbox"/> Animals/Insects <input type="checkbox"/> Confined space <input type="checkbox"/> Excavations <input type="checkbox"/> Heat/Cold <input type="checkbox"/> Poisonous Plants
List all hazards associated with this task		Signatures of Crew Members Present		<h2>Post Task Safety Analysis</h2>
				Did any injuries or incidents occur today? If yes, explain.
				<input type="checkbox"/> Yes <input type="checkbox"/> No
Barriers to eliminate/control above hazards?				Was the injury or incident reported to the safety department?
				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
				What problems did you have with today's work assignment?
		OSHA's Unqualified Minimum Clearances		
		Powerline Voltage Phase to Phase (kV)	Minimum Safe Clearance (ft.)	
		50 or below	10	
		Over 50 to 200	15	What can we do tomorrow to improve performance?
		Over 200 to 350	20	
		Over 350 to 500	25	
		Over 500 to 750	35	
		Over 750 to 1,000	45	

Supervisor Signature

Date

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT G

WORKCARE PROGRAM INFORMATION

EARLY INCIDENT INTERVENTION®

Immediate Access to Medical Advice for Work Related Incidents

(888) 449-7787

INTRODUCTION

WorkCare, Inc. (WorkCare) and TRC have partnered together to promote Incident Intervention®, a resource designed to support company safety goals/targets—while reducing runaway-costs associated with workplace injuries and illnesses.

PURPOSE

Early Incident Intervention provides TRC employees with **IMMEDIATE** telephonic access to WorkCare clinicians at the time of a presumed, non-emergency workplace injury or illness. Clinicians provide expert guidance on the evaluation of symptoms, appropriate first aid, and the need for additional medical evaluation or treatment.

When utilizing this service within the first hour of an incident, known as the “Golden Hour,” licensed medical staff can guide the case so that medical evaluation and treatment are rendered appropriately.

*“...helps the worker
traverse the unpredictable
terrain of work-related
injuries and illness.”*

PRINCIPLES OF EARLY INCIDENT INTERVENTION

- Utilizes principles of the “Golden Hour.”
- Provides workers immediate clinician support at the time of an incident.
- Focuses on providing the right care, at the right time in the proper setting.

BENEFITS FOR EMPLOYEES

- Instant access to a medically qualified professional for evaluation of symptoms and possible outcomes.
- Professional guidance on appropriate first aid measures and medications.
- Professional advice regarding the need for additional medical evaluation or treatment.

BENEFITS FOR TRC

- Point of contact for emergency and non-emergency medical clinicians.
- Triage the incident to determine risk and urgency, delivering interventions that are consistent with medical guidelines for the specified injury and illness.
- Maintains communication with clinicians to ensure accurate and timely reporting.

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017



**TRC Incident
Intervention and Wor**

Site Specific Health & Safety Plan (HASP)

Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT H

INCIDENT NOTIFICATION, AUTO INCIDENT, AND SAFE CATCH REPORTS

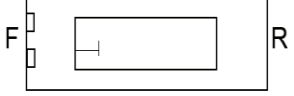


AUTO INCIDENT REPORT

EMPLOYEE INFORMATION (V-1):

Name: _____ Phone: () _____
Sector/Practice: _____ Office Location: _____
Supervisor's Name: _____ Supervisor's Phone: () _____
Project #: _____ Client's Name: _____
Driver's License #: _____ State: _____

VEHICLE INFORMATION (V-1):

Year/Make/Model of Vehicle: _____
License Plate #: _____ Vehicle ID # (VIN): _____
Circle Point of Contact:  Was Vehicle Drivable? ☐ Yes ☐ No
Vehicle Type (Use Drop List): _____
Rental Company (Use Drop List): _____
Fleet Type (Use Drop List): _____

INCIDENT INFORMATION:

Date of Incident: _____ Time of Incident: _____ A.M. _____ P.M. Photos Taken: ☐ Yes ☐ No
Location of Incident: _____ City/State: _____
Were The Authorities Contacted? Police: ☐ Yes ☐ No Ambulance: ☐ Yes ☐ No Fire: ☐ Yes ☐ No
Name of Police Dept: _____ Case #: _____ Officer Name: _____
Were Citations Issued? ☐ Yes ☐ No If Yes, To Whom? _____
Citation Number: _____
Were There Any Witnesses? ☐ Yes ☐ No If Yes, Please Provide Name, Address and Phone Below:
Witness Name: _____ Witness Phone: () _____
Witness Address: _____
Traffic Conditions (i.e., heavy, light): _____ Weather Conditions (i.e., dry, wet, ice, fog): _____
WorkCare Contacted? ☐ Yes ☐ No
TRC Driver Injured? ☐ Yes ☐ No Medical Treatment Received? ☐ Yes ☐ No
Front Seat Passenger Injured? ☐ Yes ☐ No Medical Treatment Received? ☐ Yes ☐ No
Rear Driver Side Passenger Injured? ☐ Yes ☐ No Medical Treatment Received? ☐ Yes ☐ No
Rear Passenger Side Passenger Injured? ☐ Yes ☐ No Medical Treatment Received? ☐ Yes ☐ No
Describe Injuries: _____

Describe Damage to Property Other Than Motor Vehicles (i.e., guardrails, mailboxes, etc.): _____

AUTO INCIDENT REPORT

OTHER DRIVER & VEHICLE INFORMATION (V-2):

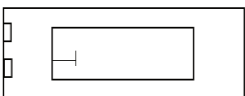
Driver's Name: _____ Driver's Phone: () _____

Driver's Address: _____

Owner's Name (If different than driver): _____ Owner's Phone: () _____

Owner's Address: _____

Year/Make/Model of Vehicle: _____ License Plate #: _____ State: _____

Circle Point of Contact: 

Was Vehicle Drivable? ☐ Yes ☐ No

Insurance Company Name: _____ Policy Number: _____

Insurance Company Phone: () _____ Number of Passengers in Vehicle: _____

List Persons Injured: _____

Were Any Other Vehicles Involved in Incident? ☐ Yes ☐ No If yes, provide details below:

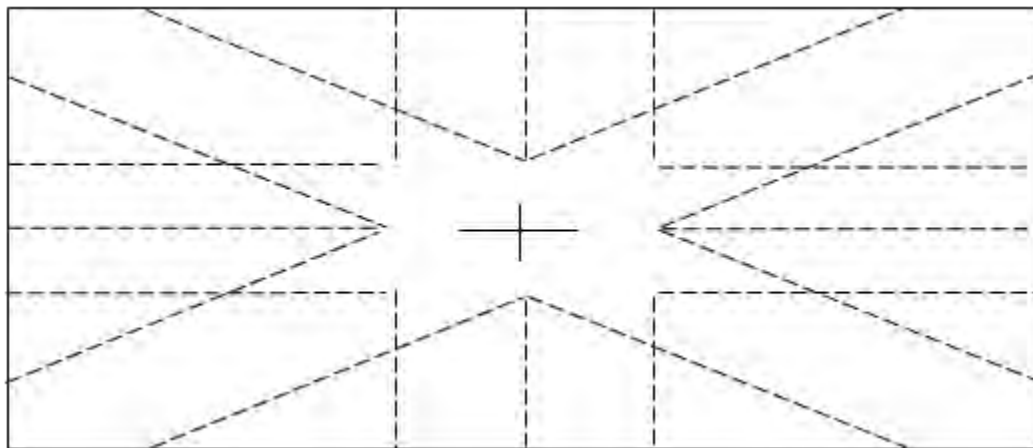
PLEASE DESCRIBE THE INCIDENT AND COMPLETE THE DIAGRAM BELOW. Be sure to indicate as many details as possible (i.e., How many lanes in each direction; Were there any turn lanes; What kind of traffic controls were there – light, stop sign, yield sign, Positions of vehicles on impact).



V-1 TRC Vehicle



V-2 Other Vehicle



Completed By: _____ Signature: _____



INCIDENT NOTIFICATION REPORT

(To be completed immediately after an Injury, Illness, Incident or Significant Near Miss by Employee's Supervisor and Employee involved)

Incident Category	
<input type="checkbox"/> Injury/Illness	<input type="checkbox"/> Near Miss/Loss <input type="checkbox"/> Property Damage <input type="checkbox"/> Other
1 Incident Location:	
2 Project #:	
3 Client:	
4 Date Incident Occurred:	Time:
5 Date Incident Reported:	Time:
TRC Employee Information	
6 Name:	Phone:
7 Office:	Address:
8 Supervisor Name:	Phone:
9 Title or Occupation:	
10 Sector/Practice:	
Incident Description	
11 Task Performed/Description of Incident:	
12 Conditions at the Time of Incident (weather, lighting, etc.):	
13 Description of Property Damage:	
Employee Injury or Illness Description	
14 Describe the Injury or Illness:	
15 First Aid/Medical Treatment Administered:	
16 Was WorkCare Contacted? <input type="checkbox"/> Yes <input type="checkbox"/> No	
17 Name of Doctor's Office, Clinic or Hospital:	
18 Address:	Phone:



INCIDENT NOTIFICATION REPORT

(To be completed immediately after an Injury, Illness, Incident or Significant Near Miss by Employee's Supervisor and Employee involved)

Subcontractor Involvement	
19	Was a subcontractor involved? <input type="checkbox"/> Yes <input type="checkbox"/> No
20	Name of Company: _____
21	Address: _____
22	Contact Name: _____ Phone: _____
23	Description of the Incident: _____

Witness Information	
24	Were there witnesses to the incident? <input type="checkbox"/> Yes <input type="checkbox"/> No
25	Name(s) Address(es) Number(s)

Immediate Corrective Actions	
26	Describe the Immediate Corrective Actions Taken: _____

Client Notification	
27	Is there a client incident notification requirement? <input type="checkbox"/> Yes <input type="checkbox"/> No
28	Contact Name: _____
29	Date of Notification: _____ Time: _____
30	Notification Method: _____

Supervisor: _____	Signature: _____	Date: _____
Employee: _____	Signature: _____	Date: _____

Site Specific Health & Safety Plan (HASP)


Lillard Ranch

County Road 102, Davis, CA

March 2017

ATTACHMENT I

**HEALTH AND SAFETY MANAGEMENT SYSTEM COMPLIANCE PROGRAMS:
CP011 HEAT STRESS PREVENTION PROGRAM, CP012 COLD STRESS PROGRAM AND CP024
EXCAVATION AND TRENCH PROGRAM**

	TRC HEALTH AND SAFETY MANAGEMENT SYSTEM	
	DOCUMENT TITLE: Heat Stress Prevention Program	
	DOCUMENT NUMBER: CP011	Revision Number: 1
	APPROVED BY: Mike Glenn	Page 1 of 10

1. PURPOSE

This Heat Stress Program has been developed to reduce the risk of heat related illness to TRC employees while working outdoors or in buildings without climate control. This program outlines the responsibilities and process for preventing heat-related illnesses and intervening if a person develops symptoms of heat stress. This program is available to all employees through TRCNET.

2. SCOPE

The program applies to all part- and full-time TRC employees.

3. DEFINITIONS

Acclimatization: Means temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.

Heat Stress: A physiological condition induced when high temperatures and humidity compromise the body's ability to cool itself, resulting in heat-related illnesses ranging in severity from mild (including heat cramps and heat rash), to moderate (heat syncope and heat exhaustion), to life threatening (heat stroke).

Heat Rash: A mild form of heat rash characterized by red papules usually appearing where clothing is restrictive.

Heat Cramps: Painful muscle contractions caused by consuming insufficient liquid when working in hot environments.

Heat Syncope: Fainting caused by standing in one position for a prolonged period of time in hot environments.


Heat Exhaustion: Heat stress characterized by headache, vertigo, weakness, thirst, and giddiness. Heat exhaustion, if left untreated, can progress rapidly to heat stroke.

Heat Stroke: A life-threatening form of heat stress characterized by a high body temperature (over 104° F), hot, dry skin, rapid heart rate, dizziness, shivering, nausea, irritability, mental confusion, convulsions, unconsciousness, and perhaps death.

High Risk Environments: Work environments where workers are routinely exposed to temperatures above 80 degrees Fahrenheit and often humid working conditions, putting them at increased risk for heat stress disorders.

Potable Water: Water that is fresh, pure, suitably cool, and provided to employees free of charge. One quart per employee per hour, for the entire shift, should be available.

Severe Risk (high-heat) Environments: Work environments where workers are routinely exposed to temperatures above 95 degrees Fahrenheit and often humid working conditions, putting them at risk for heat stress disorders.

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4. RESPONSIBILITIES

- 4.1. The National Safety Director administers the Heat Stress Program for TRC.
- 4.2. TRC's Safety Network is responsible for providing guidance to Project Managers and Superiors on selecting appropriate safety precautions based on the project-specific risk factors.
- 4.3. Project Managers are responsible for the following:
 - Assessing the heat related risks associated with a project during the planning phase. The risk factors listed in this program shall be considered when performing the risk assessment.
 - Confirming that sufficient potable water is available at project sites, most importantly at sites where employee will be working in high risk environments.
 - Confirming that employees who are working on project sites in high-risk environments have access to shade.
- 4.4. Office Safety Coordinators are responsible for assisting the project manager in developing the site-specific Health and Safety Plan (HASP), and assuring that appropriate Personal Protective Equipment (PPE) is available for employees.
- 4.5. A TRC Industrial Hygienist may be asked to evaluate specific tasks/environments and take measurements to determine the level of risk for a given area.
- 4.6. TRC Employees are responsible for the following:
 - Informing TRC Project Managers and Supervisors of personal risk factors that may increase their risk to heat related disorders.
 - Following safety precautions that have been determine appropriate for the project.
 - Communicating early symptoms of heat stress to a coworker or project managers as soon as the symptoms are recognized.

5. PROCEDURE

5.1. Hazard Assessment

Project Managers and Supervisors shall assess project work during the planning phase for risk factors that can cause heat stress to TRC employees. There are four key risk factors that can affect the heat stress in the workplace, which are listed below. These risk factors will be managed to reduce the heat stress to employees working in high risk and severe risk environments.

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5.1.1.Environmental conditions

- Temperature;
- Humidity; and
- Air movement.

5.1.2.Hot surfaces (machines, ovens, engines, etc.).

5.1.3.Physical activity (i.e., metabolic rate)


- Rest - Sitting
- Light - Sitting with light manual work with hands or hands and arms, and driving. Standing with some light arm work and occasional walking.
- Moderate - Sustained moderate hand and arm work, moderate arm and leg work, moderate arm and trunk work, or light pushing and pulling. Normal walking.
- Heavy - Intense arm and trunk work, carrying, shoveling, manual sawing; pushing and pulling heavy loads; walking and fast pace.
- Very Heavy - Very heavy activity at fast to maximum pace.

5.1.4.Clothing/PPE (e.g., Tyvek suit, flame resistant clothing, gloves, respirator, etc.)

5.1.5.Personal factors

- ability to acclimatize to hot environments;
- medical conditions;
- increasing age;
- overall level of fitness;
- presence of other metabolically stressful illnesses;
- use of certain medications;
- dehydration; and
- alcohol intake.

5.2. Based on this assessment, appropriate safety precautions shall be identified and implemented to minimize the risk of heat stress. When employees are exposed to multiple risk factors, the safety precautions should be increased. When there is uncertainty of the potential risk of heat stress, a quantitative exposure assessment can be performed by an industrial hygienist.

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5.3. There are two primary methods for measuring and characterizing heat index levels in the workplace. One method compares the Wet Bulb Globe Temperature to the Threshold Limit Values (TLVs) for Heat Stress and Heat Strain published by the American Conference of Governmental Industrial Hygienists (ACGIH). The second method compares the temperature and humidity to the National Oceanographic and Atmospheric Administration (NOAA) Heat Index values.

5.4. The hazard assessment and safety precautions should be listed in the site-specific health and safety plan and communicated to the affected employees.

5.5. Project Managers and Supervisors shall consider one or more of the following safety precautions as necessary to minimize the risk of heat stress to employees. Personal risk factors should also be considered when selecting and implementing safety precautions.

5.6. Safety Precautions

The following safety precautions that can be used to reduce the risk of heat stress to workers. The extent and number of safety precautions shall be proportionate to the heat index in the working environment.


5.6.1.Ventilation – Where available, general ventilation (fans) can be provided. This should result in increased cooling of the body by increasing the convective heat loss and the sweat evaporation heat loss.

5.6.2.Air Conditioning – Vehicles and buildings are often equipped with air conditioning. When possible employees should be provided rest periods in air conditioning to reduce the risk of heat stress.

5.6.3.Acclimatization – An employee can best adapt to heat by being in the hot environment initially for very short periods, then longer periods. Acclimatization may take several days or longer, depending upon all the factors listed above. Acclimatization must be repeated if the employee is off work for an extended period or has been ill.

5.6.4.Hydration – Employees shall have access to potable water, starting at the beginning of the workday. Employees may begin the shift with smaller quantities of water if effective procedures for replenishment of water during the shift have been implemented to provide employees one quart or more per hour. Employees must also have multiple opportunities to consume the liquids throughout the workday.

5.6.5.Shade – Shade that is either open to the air or provided with ventilation shall be available as close to workers as practical whenever there is a risk of heat stress, or the temperature reaches 80 degrees Fahrenheit. Employees who need a cool-down period to avoid developing heat stress symptoms shall be provided access to shade. Shade areas must be able to comfortably accommodate all TRC employees who desire a cool-down period, and also the maximum number of TRC employees taking a meal break simultaneously.

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Shade can include trees, buildings, canopies, lean-tos, or other partial and/or temporary structures that are either ventilated or open to air movement. The interior of cars or trucks are not considered shade unless the vehicles are air conditioned or kept from heating up in the sun by another method.

5.6.6.Communication and Observation – Employees working in severe risk (high-heat) work environments must maintain continual communication with coworkers. This can be accomplished verbally or via cellular telephones.

5.6.7.Limiting exposure time – Work schedules should be designed to limit the employees' time spent in high risk and severe risk environments (for example, scheduling outdoor work during the cooler hours of the day). Work breaks must provide employees with an opportunity to move to a cooler environment.

5.6.8.Appropriate clothing – Whenever possible, clothing provided to workers in hot environments should be permeable to air and loose fitting. Less clothing is not necessarily a viable option due to possibility of radiant heat burns or sunburn or work hazards (i.e., flammable/combustible liquids, electrical hazards, etc.).

5.6.9.Auxiliary Body Cooling – For employees who must work in areas at high risk for causing heat stress, commercially available cooling vests and other personal protective equipment are available and should be considered.


5.7. For work environments that have severe risk (above 95 degrees F), the following safety precautions must be implemented:

5.7.1.Communication and Observation – Employees working in severe risk (high-heat) work environments must maintain continual communication with coworkers. This can be accomplished verbally or via cellular telephones.

5.7.2.Emergency Coordinator – One or more employees and the worksite shall be designated as the emergency coordinator. The coordinator will be provided a cellular phone and authorized to call for emergency medical services (following the Site-specific Health and Safety Plan) if an employee experiences significant heat stress symptoms.

5.7.3.Hydration Reminders – The Project Manager or Site Supervisor shall periodically remind employees of the importance to consume water, even if they're not thirsty.

5.7.4.Tailgate meetings – During the pre-shift meeting, employees shall be reminded of the symptoms associated with heat stress, the importance to stay hydrated, and the requirement to follow safety precautions identified by the Project Manager and/or Site Supervisor.


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5.8. Heat Stress Disorders/Symptoms and First Aid Measures


5.8.1. Employees and Project Managers shall be knowledgeable on the following heat disorders, the associated symptoms and the appropriate first aid / medical attention.

5.8.2. If an employee exhibits symptoms of heat stress, or if symptoms are observed by a coworker, the appropriate first aid/ medical attention listed in the following tables should be provided.

Heat Disorder	Symptoms	First Aid / Medical Attention
Heat Stroke Heat stroke occurs when the body becomes unable to control its temperature and the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Heat stroke can cause death or permanent disability if emergency treatment is not given.	<ul style="list-style-type: none"> ▪ Hot, dry skin or profuse sweating ▪ Hallucinations ▪ Chills ▪ Throbbing headache ▪ High body temperature ▪ Confusion/dizziness ▪ Slurred speech 	<ul style="list-style-type: none"> ▪ Call 911. ▪ Move the person to a cool shaded area. ▪ Cool the person using methods such as: <ul style="list-style-type: none"> — Soaking their clothes with water. — Spraying, sponging, or showering them with water. — Fanning their body.
Heat Exhaustion Heat exhaustion is the body's response to an excessive loss of water and salt, usually through excessive sweating.	<ul style="list-style-type: none"> ▪ Heavy sweating ▪ Extreme weakness or fatigue ▪ Dizziness, confusion ▪ Nausea ▪ Clammy, moist skin ▪ Pale or flushed complexion ▪ Muscle cramps ▪ Slightly elevated body temperature ▪ Fast and shallow breathing 	<ul style="list-style-type: none"> ▪ Have person rest in a cool, shaded or air-conditioned area. ▪ Have them drink plenty of water. ▪ Have them take a cool shower. ▪ Medical approval required to return to work.

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Heat Disorder	Symptoms	First Aid / Medical Attention
Heat Syncope Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatization.	<ul style="list-style-type: none"> ▪ Light-headedness ▪ Dizziness ▪ Fainting 	<ul style="list-style-type: none"> ▪ Sit or lie down in a cool place when they begin to feel symptoms. ▪ Slowly drink water, clear juice, or a sports beverage. ▪ Obtain medical approval to needed to return to work.
Heat Cramps Heat cramps usually affect workers who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.	<ul style="list-style-type: none"> ▪ Muscle pain or spasms usually in the abdomen, arms, or legs. 	<ul style="list-style-type: none"> ▪ Stop all activity, and sit in a cool place. ▪ Drink clear juice or a sports beverage. ▪ Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke. ▪ Seek medical attention if any of the following apply: <ul style="list-style-type: none"> — The worker has heart problems. — The worker is on a low-sodium diet. — The cramps do not subside within one hour.

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Heat Disorder	Symptoms	First Aid / Medical Attention
Heat Rash Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.	<ul style="list-style-type: none"> Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases. 	<ul style="list-style-type: none"> Try to work in a cooler, less humid environment when possible. Keep the affected area dry. Dusting powder may be used to increase comfort.


Source: Center for Disease Control and Prevention (CDC)

5.9. Training:

Training is a critical element of heat stress prevention. All supervisors and employees must be trained in 1) the recognition of the signs and symptoms of impending heat illness, 2) the heat stress prevention methods that can reduce the risk of heat disorders, and 3) the basic First Aid procedures for heat stress symptoms. Supervisors will receive this training prior to supervision of employees.

At a minimum, heat stress prevention training will include the following topics:

- Health hazards related to heat stress.
- TRC's procedures for identifying, evaluating and controlling exposures to the environmental and personal risk factors for heat illness.
- Recognition of predisposing factors, danger signs, and symptoms.
- The importance of immediately reporting symptoms or signs of heat illness in themselves to the Project Manager, the Site Employee(s) or Work Care.
- Procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary.

	TRC HEALTH AND SAFETY MANAGEMENT SYSTEM	
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6. REFERENCES/RELATED DOCUMENTATION

NIOSH Research Report, Relationships Between Several Prominent Heat Stress Indices, 1976 Jensen & Heins.

Occupational Exposures to Hot Environments, NIOSH Revised Criteria, 1986.

ACGIH TLV & Biological Exposure Indices for 2007, ACGIH.


Beshir, M.Y., A Comprehensive Comparison Between WBGT and Botsball, American Industrial Hygiene Association Journal, February 1981.

OSHA Technical Manual: Heat Stress (Directive Number: TED 01-00-015), 1999

Memorandum: Extreme Heat-Related Outdoor Inspections, OSHA Memo, July 2012

7. APPENDICES

Appendix A: Heat Index Table

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APPENDIX A

Having awareness of heat illness symptoms can save your life or the life of a co-worker. The following table provides valuable information concerning heat-related illnesses and the level of safety precautions that should be implemented.

HEAT INDEX TABLE

NOAA's National Weather Service

Heat Index

Temperature (°F)

Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity


Caution

Extreme Caution

Danger

Extreme Danger

Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement safety precautions and heighten awareness
103°F to 115°F	High	Additional safety precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive safety precautions

	TRC HEALTH AND SAFETY MANAGEMENT SYSTEM	
	DOCUMENT TITLE: Cold Stress Program	
	DOCUMENT NUMBER: CP012	Revision Number: 0
	APPROVED BY: Mike Glenn	Page 1 of 6

1. PURPOSE

This Cold Stress Program has been developed to proactively prevent TRC employees from developing cold-related illness and injury.

The Cold Stress Program is designed to:

- Inform employees about potential hazards associated with working in a cold environment.
- Provide guidelines for recognizing symptoms of cold-related illnesses ranging from hypothermia to frostbite.
- Prevent employee injuries and illnesses caused by cold stress.
- Comply with all applicable federal and state regulations.

2. SCOPE

The program applies to all part- and full-time TRC employees, and will help to identify Primary Factors or Environmental Factors:

- Certain medications may prevent the body from generating heat normally. These medications include antidepressants, sedatives, tranquilizers, and heart medications.
- Medical conditions can also increase the risk of cold stress. These include heart disease, asthma/bronchitis, diabetes, and vibration/white finger disease.
- Low temperatures.
- Cool high wind.
- Dampness.
- Cold water.


3. DEFINITIONS

Frostbite: The freezing or the local effect of partial freezing of some part of the body. High surface-area-to-volume ratios such as the fingers, toes, ears, nose, and cheeks are most susceptible to frostbite.

Hypothermia: A severe drop in core body temperature due to overexposure to low temperatures.

Trench Foot: Caused by having feet exposed to wet cold environments or immersed in cold water for long periods of time. Victims will generally complain of tingling, itching or burning sensations and blisters may form in affected areas.

Wind Chill: A measure of the rate of heat loss from exposed skin caused by the combined effects of high winds and low temperatures. The wind chill temperature is what the temperature “feels like” during cold weather as a result of the wind. As the wind increases, it draws heat from the body temperature.


	TRC HEALTH AND SAFETY MANAGEMENT SYSTEM	
	DOCUMENT TITLE: Cold Stress Program	
	DOCUMENT NUMBER: CP012	Revision Number: 0
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4. RESPONSIBILITIES

- 4.1. The National Safety Director administers the Cold Stress Program for TRC.
- 4.2. The Project Manager will be provided a copy of this program and is responsible for assessing the risks of a project including identification of when cold stress prevention measures may be required.
- 4.3. Office Safety Coordinators are responsible for assisting the Project Manager in developing the Site-Specific Health and Safety Plan (HASP), and assuring that appropriate Personal Protective Equipment (PPE) is available for employees.
- 4.4. A TRC Industrial Hygienist may be asked to evaluate specific tasks/environments and take measurements to determine the level of risk for a given area.
- 4.5. TRC Employees are responsible for reviewing and complying with the program.

5. PROCEDURE


When working in cold environments, most of the body's energy is used to maintain the internal body temperature. This is done by reducing heat loss and increasing heat production. Under cold conditions, blood vessels in skin, arms and legs constrict, decreasing blood flow. Over time, the body will shift blood flow from the extremities and skin to the core. This allows exposed skin and extremities to cool rapidly and increases the risk of frostbite and hypothermia. Trench foot or immersion foot occurs when feet are cold and damp while wearing constricting footwear. Unlike frostbite, immersion foot does not require freezing temperatures and can occur in temperatures up to 60° F. The condition can occur with as little as eleven hours of exposure.

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The following table identifies each condition, the signs and symptoms, and recommended First Aid:

Cold Stress Disorders

Condition	Signs and Symptoms	First Aid
Mild Hypothermia Usually occurs when the core body temperature drops between 98 - 90°F.	<ul style="list-style-type: none"> • Shivering; • Lack of coordination, stumbling, fumbling hands; • Slurred Speech; • Memory Loss; and/or • Pale, cold skin. 	<ul style="list-style-type: none"> • Move to warm area; • Stay active; • Remove wet clothes and replace with dry clothes or blankets and cover head; and/or • Drink a warm (not hot) sugary drink.
Moderate Hypothermia Usually occurs when the core body temperature drops between 90 - 86°F.	<ul style="list-style-type: none"> • Shivering stops; • Unable to walk, to stand; and • Confused and irrational. 	<ul style="list-style-type: none"> • All of the above plus: • Call 911 for an ambulance; • Cover all extremities; completely; and • Place very warm objects, such as hot packs or water bottles on the victim's head, neck, check and groin.
Severe Hypothermia Usually occurs when the core body temperature drops between 86 - 78°F.	<ul style="list-style-type: none"> • Severe muscle stiffness; • Very sleepy or unconscious; • Ice cold skin; and • Death. 	<ul style="list-style-type: none"> • Call 911 for an ambulance; • Treat the victim very gently; and • Do not attempt to re-warm. The victim should receive treatment in a hospital.
Frostbite Usually occurs when the skin actually freezes and loses water. Frostbite usually occurs when temperatures are below 30° F. Wind chill factors can allow frostbite to occur in above freezing temperatures.	<ul style="list-style-type: none"> • Cold, tingling, stinging or aching feeling in the frostbitten area. This is followed by numbness; • Skin color turns red, then purple, then white or very pale. The skin is cold to the touch; and • Blistering in severe cases. 	<ul style="list-style-type: none"> • Call 911 for an ambulance; • Do not rub the area; • Wrap frostbitten area with a soft cloth; • If help is delayed, immerse in warm, not hot, water. Do not pour water on affected area; and • Apply sterile dressings to blisters to prevent breaking.
Trench Foot Usually occurs by having feet immersed in cold water for long periods of time. Similar to frostbite, but less severe.	<ul style="list-style-type: none"> • Tingling, itching or burning sensation; and • Blisters may also be present. 	<ul style="list-style-type: none"> • Soak feet in warm, not hot, water; • Wrap with a dry soft cloth or bandage; and • Drink a warm, sugary drink.

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5.1 Cold Stress Prevention:

5.1.1 Clothing:


- Protective clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wools retains its insulation value even when wet. The following are recommendations for working in cold environments:
 - Wear at least three layers of clothing:
 - An outer layer to break the wind and allow some ventilations (Gortex or nylon);
 - A middle layer of down or wool to absorb sweat and provide insulation even when wet;
 - An inner layer of cotton or synthetic weave to allow for ventilation.
 - Wear a hat. Up to 40% of body heat can be lost when the head is left exposed.
 - Wear insulated boots or other footwear. Tight-fitting footwear restricts blood flow. Footwear should be large enough to allow wearing of either one thick or two thin pairs of socks.
 - Keep a change of dry clothing available in case worn clothes become wet.
 - Do not wear tight clothing. Loose clothing allows for better ventilation.
 - Cover your mouth to protect your lungs, avoid taking deep breaths, and minimize talking.
 - Employees who get hot while working should open their jackets, but keep hats and gloves on.

5.1.2 Food and Hydration:

- Caffeine is discouraged because it increases the water loss and blood flow to the extremities.
- Employees should drink warm sweet drinks and soups to maintain caloric intake and fluid volume.

5.1.3 Buddy System:

Employees working in cold environments, or who are not acclimated to cold environments should not work alone. In situations, employees should be assigned a “buddy” to provide constant verbal or visual communication. The employees should be aware of symptoms related to cold stress.

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5.1.4 Work Schedule:

If possible, heavy work should be scheduled for the warmer parts of the day. Workers should take frequent breaks out of the cold and eat warm, high-calorie food. Try to work in pairs so workers can keep an eye on each other and watch for signs of cold stress. Avoid fatigue since energy is needed to keep muscles warm.

5.1.5 Wind-Chill Index:


Wind-chill index involves the combined effect of air temperature and air movement. Wind-chill cooling rate is defined as heat loss (expressed in watts per meter squared) resulting from the effects of air temperature and wind velocity upon exposed skin. The higher the wind speed and the lower the temperature in the work environment, the greater the insulation value of the protective clothing required. The chart below illustrates the wind chill temperature and the levels at which frostbite can occur in 15 minutes or less.

Wind Chill Chart

		Temperature (Fahrenheit)																	
Wind (miles per hour)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
Frostbite Times		30 minutes						10 minutes						5 minutes					
														5 minutes					

5.2 Training:

Training is a critical element of cold stress prevention. All supervisors and employees must be trained in 1) the recognition of the signs and symptoms of impending cold illness, 2) the cold stress prevention methods that can reduce the risk of cold illness disorders, and 3) the basic First Aid procedures for cold stress symptoms.

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At a minimum, cold stress prevention training will include the following topics:

- Knowledge of the hazards of cold stress;
- TRC's procedures for identifying, evaluating and controlling exposures to the environmental and personal risk factors for cold illness;
- The importance of drinking warm sweet drinks and soups to maintain caloric intake and fluid volume;
- Recognition of predisposing factors, danger signs, and symptoms;
- The importance of immediately reporting symptoms or signs of cold illness in themselves, or in co-workers to the Project Manager or Work Care;
- TRC's procedures for responding to symptoms of possible cold illness, including how emergency medical services will be provided should they become necessary;
- Procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider;
- Awareness of First Aid procedures for, and the potential health effects of, hypothermia;
- The Site Employee(s) responsibilities in avoiding cold stress;
- Dangers of using antidepressants, sedatives, tranquilizers, and heart medications.

6. REFERENCES/RELATED DOCUMENTATION

CP002 – Risk Analysis/Site-Specific Health and Safety Program

Centers for Disease Control and Prevention, Cold Stress, <http://www.cdc.gov/niosh/topics/coldstress>

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1. PURPOSE

TRC's Trench and Excavation Compliance Program has been developed based on the Occupational Safety and Health Administration (OSHA) standards for the construction industry (29 CFR 1926, Subpart P – Excavations).

2. SCOPE

This Compliance Program applies to all open excavations made in the earth's surface. Excavations are defined to include trenches. These guidelines apply to all Operating Unit facilities and project sites.

3. DEFINITIONS

Accepted engineering practices: Those requirements which are compatible with standards of practice required by a registered professional engineer.

Aluminum Hydraulic Shoring: A pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

Bell-bottom pier hole: A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

Benching (Benching system): A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

Cave-in: The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.


Competent person: One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Cross braces: The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

Excavation: Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

Faces or Sides: The vertical or inclined earth surfaces formed as a result of excavation work.

Failure: The breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

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Hazardous atmosphere: An atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

Kick-out: The accidental release or failure of a cross brace.

Protective system: A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Ramp: An inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

Registered Professional Engineer: A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

Sheeting: The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield (Shield system): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

Shoring (Shoring system): A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation, and which is designed to prevent cave-ins.


Sloping (Sloping system): A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Stable rock: Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Structural ramp: A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

Support system: A structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Tabulated data: Tables and charts approved by a registered professional engineer, and used to design and construct a protective system.

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Trench (Trench excavation): A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Trench box: See Shield.

Trench shield: See Shield.

Type A soil: Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam, and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hard pan are also considered Type A. However, no soil is Type A if:


- The soil is fissured.
- The soil is subject to vibration from heavy traffic, pile driving, or similar effects.
- The soil has been previously disturbed.
- The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater.
- The material is subject to other factors that would require it to be classified as a less stable material.

Type B soil: Cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf; granular cohesion less soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and in some cases, silty clay loam and sandy clay loam; previously disturbed soils except those that would otherwise be classed as Type C soil; soil that meets the unconfined compressive strength or cementation requirements for Type A but is fissured or subject to vibration; dry rock that is not stable; material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C soil: Cohesive soil with an unconfined compressive strength of 0.5 tsf or less; granular soils, including gravel, sand, and loamy sand; submerged soils, including soil from which water is freely seeping; submerged rock that is not stable; material in a sloped, layered system where the layers dip into the excavation at a slope of four horizontal to one vertical (4H:1V) or steeper.


Uprights: The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

Wales: Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.


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4. RESPONSIBILITIES

- 4.1 TRC's National Safety Director is responsible for establishing the Trench and Excavation Program requirements and providing/communicating them to the Health and Safety Network. The National Safety Director will review contract documents as required that include project and Client-Specific Requirements.
- 4.2 The Health and Safety Network is responsible for the Trench and Excavation Program implementation including, but not limited to:
- Qualifying or identifying Competent Person(s) for trench and excavation safety.
 - Training new and existing TRC employees.
 - Communicating and coordinating TRC's Trench and Excavation Program requirements with all TRC subcontractors, including identification of Subcontractor(s) Competent Person(s).
 - Procuring TRC health and safety equipment (harnesses, lanyards, vertical and horizontal lifeline and other materials).
 - Working in conjunction with identified Competent Person(s) to provide on-site direction on Trench and Excavation issues.
 - Leading all investigations along with the Competent Person, Project Manager, Field Team Leader, and subcontractor health and safety representative or their designees, if a Trench and Excavation Program violation occurs on-site.
 - Assisting in Trench and Excavation Program audits in conjunction with on-site TRC subcontractor, and the health and safety representatives or their designees.
 - Maintaining records for health and safety activities on-site including equipment inspections and procedural audits of employee Trench and Excavation Program implementation.
 - Coordinating assistance during emergency situations.
- 4.3 OSHA defines a Competent Person as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, who has authorization to take prompt corrective measures to eliminate them (29 CFR 1926.32[f]). By way of training and/or experience, a Competent Person is knowledgeable of applicable standards, and is capable of identifying workplace hazards related to the specific operation. Under TRC's Trench and Excavation Program the Competent Person will:
- Perform all duties as specified in the Trench and Excavation Program.

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- Review and approve all Health and Safety Plans (HASPs) and Job Safety Analyses (JSAs) that include work in and around trenches and excavations.
 - In the event of simultaneous operations, cooperate fully with the Subcontractor's Person in Charge.
 - Communicate with performing authorities (i.e., employees working in or around trenches or excavations) regarding the presence of other operations on-site.
 - Work with Project Manager and/or Field Team Leader to identify and manage the risks associated with the project site.
 - Assist in the training of employees who will be performing tasks in and around a trench or excavation.
 - Ensure that a rescue plan is established by working with the Project Manager and/or facility safety personnel prior to any employees entering or working around a trench or excavation.
 - Provide guidance as required for Trench and Excavation Program issues and questions.
 - Coordinate with Project Managers and Health and Safety Network on trench and excavation audits.
 - Observe the implementation of Trench and Excavation Program and conduct audits as required or directed.
- 4.4 The Project Manager is responsible for assisting the Health and Safety Network in the implementation of the Trench and Excavation Program. Project Managers must hold all TRC and other project employees working on-site accountable (zero tolerance policy) for maintaining a safe work environment.
- 4.5 Project Managers and site employees shall be held accountable for performing work in a safe manner according to the requirements of the Trench and Excavation Program.
- 4.5.1 The Field Team Leader shall:
- Participate in Trench and Excavation Awareness training.
 - Confirm that Competent Personnel prepared and/or reviewed the Site-Specific Rescue Plan if required.
 - When required, confirm that everyone working under a specific permit adheres to the permit's documented conditions.

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5. PROCEDURE


5.1 General Requirements Permit labor

The following guidelines establish the minimum requirements of the applicable state and federal safety regulations for all work in excavations and trenches that might expose employees to the hazards of moving ground:


- All surface encumbrances adjacent to an excavation that might create a hazard to employees must be removed, secured, or supported as necessary to protect employees.
- The estimated location of underground installations, such as sewer, telephone, electric, water, or other underground utilities must be identified before opening an excavation. Utility companies, owners, and local One Call locator services must be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations before the work begins.
- When excavations approach the estimated location of underground installations, the exact location is determined by probing or hand digging, as necessary, to prevent accidental contact with the underground installations. While the excavation is open, underground installations that create a hazard to employees will be supported, protected, or removed as necessary to protect employees.

5.1.1 Access and Egress - Structural ramps.


- Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.
- Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
- Structural members used for ramps and runways shall be of uniform thickness.
- Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.
- Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.
- Appropriate access and egress in the form of a stairway, ladder, or ramp must be provided in all excavations deeper than 4 feet (1.23 m). In trenches, the stairway, ladder, or ramp must be installed so that a worker does not have to travel farther than 25 feet (7.62 m) in any direction to exit.

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- Employees exposed to vehicular traffic must wear safety vests or other equivalent apparel marked with or made of reflectorized or high-visibility material.
- No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.
- A warning system must be provided when mobile equipment is operated adjacent to an excavation and the operator does not have a clear and direct view of the edge of the excavation. The warning system may include barricades, signals, stop logs, or other authorized methods. If possible, the grade should be away from the excavation.
- When deemed necessary by a competent person, excavations where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.
- When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.
- Emergency rescue equipment, such as rescue breathing apparatus, a safety harness and line, or a basket stretcher must be available where a hazardous atmosphere exists or could be expected to develop in an excavation.
- Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.
- Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

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- If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.
- Inspection of an excavation shall be made by a competent person when accumulation of water is present.
- If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person.
- The stability of adjacent structures, such as buildings, walls, and sidewalks must be maintained using a support system as necessary to protect employees.
- Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:
 - A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
 - The excavation is in stable rock; or
 - A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or
 - A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.
- Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.
- Employees must be protected from loose rock or soil that could fall or roll into the excavation by placing and keeping such material at least 2 feet (0.61 m) from the edge of the excavation.
- A competent person must make daily inspections of excavations to identify and eliminate conditions that could result in cave-ins, failure of support systems, hazardous atmospheres, or other unsafe conditions. Inspections must be conducted before the start of work each day and after every rainstorm or other occurrence that might increase the hazard of moving ground. If problems are found, provisions should be made for immediate removal of personnel.

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- Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- Where employees or equipment are allowed or required to cross over excavations that are 6 feet
- (1.83 m) or greater in depth, appropriate fall protection in the form of walkways or bridges with standard guardrails must be provided.
- An open excavation or trench that is left open overnight must be barricaded, covered, and secured in a manner that prevents anyone from entering the excavation intentionally or accidentally.

5.2 Protective Systems

Sloping, shoring, or shielding will be provided in excavations, except where the excavation is made in stable rock or the excavation is less than 5 feet (1.52 m) deep and an examination by a competent person does not indicate a potential for cave-in.

5.3 Sloping

When sloping or benching is chosen as the method to protect employees in an excavation, one of the following optional designs of sloping and benching systems must be used:


- Option 1 – Slope the excavation at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal).
- Option 2 – Perform a soil classification and determine the acceptable slopes required.
- Option 3 – Use a project-specific design prepared by a registered professional engineer.

Engineered designs must be in writing, be rubber stamped, and must include the name and registration number of the engineer, detailed plans, the calculations used in the design, the magnitude of slopes, and the configurations determined to be safe. A copy of the design will be maintained at the jobsite during the use of the engineered system.

5.4 Shoring or Shielding

Only the following methods for support systems, shield systems, and other protective systems can be used at a TRC jobsite:

- Option 1 – Perform a soil classification and determine the appropriate support, shield or other protective system configuration using the shoring manufacturer's tabulated data.

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When using the manufacturer's tabulated data, the shoring system must be installed in accordance with all the specifications, recommendations, limitations, or approvals to deviate issued by the manufacturer. The manufacturer's tabulated data, specifications, recommendations, limitations, and any approval to deviate must be in writing, and maintained at the jobsite during the use of the shoring system.

- Option 2 – Use a project-specific design prepared by a registered professional engineer.


Engineered designs must be in writing, be rubber stamped, and include the name and registration number of the engineer, detailed plans, the calculations used in the design, and the sizes, types, and configurations of materials to be used in the support system. A copy of the design must be maintained at the jobsite during the use of the engineered system.

5.5 General Guidelines

The materials and equipment used for protective systems must be free of damage or defects that might impair their proper functions. Manufactured materials and equipment must be used and maintained in accordance with the recommendations of the manufacturer. If material or equipment used in a protective system is damaged, it must be inspected by a competent person before being reused.

The installation and removal of protective systems must be performed in accordance with all of the following guidelines:

- Members of support systems must be securely fastened together to prevent sliding, falling, kick-outs, or other predictable failures.
- Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or being struck by members of the support system.
- Individual members of support systems must not exceed their design capacities.
- Before individual members can be removed, additional precautions must be taken to protect employees, including installing other structural members to support any additional load imposed on the support system.
- Removal begins at, and progresses from, the bottom of the excavation. Members must be released slowly to reduce the likelihood of failure of the remaining members or a cave-in.
- Backfilling must progress with the removal of support systems.
- Support systems must be coordinated with the excavation of trenches and must extend to within 2 feet (0.61 m) of the bottom of the trench, but only if the system is designed to resist the forces calculated for the full depth of trench, and there is no indication of a loss of soil from behind or below the bottom of the support system.


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- Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.
- Shield systems must not be subjected to loads exceeding their design capacities. Shields must be installed in a manner that restricts lateral or hazardous movement in the event that a lateral load is applied suddenly. Employees must be protected when entering or exiting the areas protected by a shield. Employees are not allowed within the shield during installation, removal, or vertical movement.
- When shield systems are used in trenches, excavation of material may proceed 2 feet (0.61 m) below the bottom of the shield only if the shield is designed to resist the forces calculated for the full depth of trench and there is no indication of a loss of soil from behind or below the bottom of the shield.

5.6 Soil Classification

This section describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits.

- Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C, in accordance with the definitions set forth in this compliance program.
- Soil and rock deposits are classified based on the results of at least one visual and one manual analysis. These analyses must be conducted by a competent person using the tests described in this chapter or other approved methods of soil classification, such as those adopted by the American Society for Testing Materials (ASTM) or the United States Department of Agriculture (USDA).
- The methods used for visual and manual analyses must provide quantitative and qualitative information sufficient to identify the properties, factors, and conditions of the deposits.
- A layered system must be classified based on the weakest layer. However, each layer may be classified individually when a more stable layer lies below a less stable layer.
- If, after classifying a deposit, the properties, factors, or conditions change in any way, the changes must be evaluated by a competent person. The deposit must be reclassified as necessary to reflect the new circumstances.

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5.7 Visual Analysis


The visual analysis is conducted to collect qualitative information about the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the excavation, and soil samples taken from the excavated material. The visual analysis includes:

- Observing samples of the soil that are excavated and soil in the sides of the excavation to estimate the range of particle sizes and the relative amounts of particle sizes. Fine-grained material is cohesive.
- Observing the soil as it is excavated to determine if it stays in clumps. Soil that breaks up easily and does not stay in clumps is granular.
- Observing sides of the opened excavation and the surface area adjacent to the excavation to identify tension cracks or fissured material.
- Observing the area adjacent to the excavation and the excavation itself to identify existing underground utilities, structures, or previously disturbed soils.
- Observing the opened sides of the excavation to identify layered systems. Examine layered systems to determine if the layers slope toward the excavation, and to estimate the degree of slope in the layers.
- Observing the area adjacent to the excavation and the areas within the excavation to identify potential sources of vibration that might affect the stability of the excavation.
- Observing the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the water table.

5.8 Manual Analysis

Manual analysis is conducted to collect quantitative and qualitative information about the properties of the soil, and to provide more information to properly classify the soil. The manual analysis includes some or all of the following methods:

- Evaluating the plasticity of the soil by molding a moist or wet sample of soil into a ball and attempting to roll it into threads as thin as 1/8 inch (0.32 cm) in diameter. Cohesive material can be rolled into a thread at least 2 inches (5.08 cm) long without crumbling or breaking.
- Evaluating the cohesiveness of the soil. If the soil is dry and crumbles into individual grains or fine powder with little or moderate pressure, it is granular. If the soil is dry and falls into clumps that break into smaller clumps but the smaller clumps can only be broken up with difficulty, it might be clay in combination with gravel, sand, or silt. If the dry soil breaks into small clumps that can only be broken with difficulty and there is no visual indication the soil is fissured, the soil may be considered unfissured.

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- Applying the thumb penetration test to estimate the unconfined compressive strength of cohesive soils. Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb and can be molded by light finger pressure.
- The thumb test should be conducted on an undisturbed soil sample, such as a large clump of soil, as soon as possible after excavation to minimize the effects of drying. If the excavation is later exposed to rain, flooding, or other moisture, the classification of the soil must be changed accordingly.
- Estimating the unconfined compressive strength of soils by using a pocket penetrometer or a hand-operated shear vane in accordance with the manufacturer's recommendations.
- Performing a drying test to differentiate among cohesive material with fissures, unfissured cohesive material, and granular material. After thoroughly drying a sample of soil that is approximately 1 inch (2.54 cm) thick and 6 inches (15.24 cm) in diameter, evaluate the results as follows:
 - If the sample develops cracks as it dries, significant fissures are indicated.
 - If the sample dries without cracking and can be broken by hand, then the material is either unfissured cohesive or fissured cohesive.
 - If considerable force is necessary to break the sample, the soil has significant cohesive material content. The soil can be classified as unfissured cohesive material, and the unconfined compressive strength should be determined.
 - If the sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

5.9 Sloping and Benching Specifications

This section contains the specifications for using sloping and benching to protect employees working in excavations.

- These slope and bench specifications only apply if a soil classification has been conducted and the excavation will be 20 feet (6.10 m) deep or less.
- Determine the maximum allowable slope and configuration based on the soil classification by using the information in table(s) 1, 2 and 3.


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Table 1 Maximum Allowable Slope Based on Soil Classification

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) ⁽¹⁾ FOR EXCAVATIONS LESS THAN 20 FEET DEEP ⁽³⁾
STABLE ROCK	VERTICAL (90°)
TYPE A ⁽²⁾	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1½:1 (34°)

1. The numbers shown in parentheses next to the maximum allowable slopes are angles expressed in degrees from the horizontal. The angles have been rounded off.
2. A short-term, maximum slope of 1/2:1 (63 degrees) is allowable in excavations in Type A soil less than 12 feet (3.66 m) deep. The short-term maximum allowable slopes for excavations deeper than 12 feet (3.66 m) is 3/4 (53 degrees).
3. Sloping or benching for excavations deeper than 20 feet (6.10 m) must be designed by a registered professional engineer.



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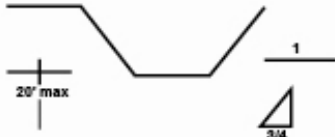
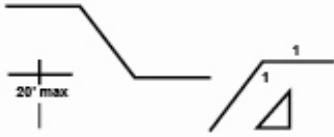
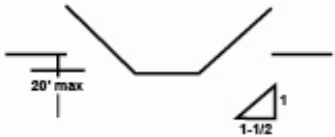
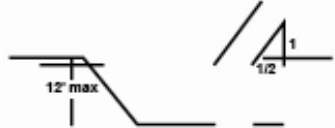

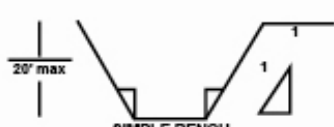


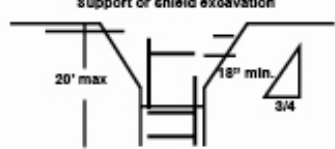
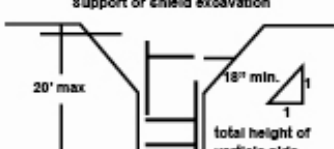
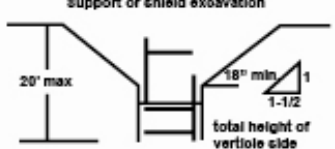
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Table 2 Excavations in Type A, B, and C Soils

EXCAVATIONS IN TYPE A SOIL	EXCAVATIONS IN TYPE B SOIL	EXCAVATIONS IN TYPE C SOIL
<p>SIMPLE SLOPES LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 3/4:1</p>  <p>20' max</p> <p>3/4</p> <p>SIMPLE SLOPE</p>	<p>SIMPLE SLOPES LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 1:1</p>  <p>20' max</p> <p>1</p> <p>SIMPLE SLOPE</p>	<p>SIMPLE SLOPES LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 1-1/2:1</p>  <p>20' max</p> <p>1-1/2</p> <p>SIMPLE SLOPE</p>
<p>EXCEPTION: SHORT-TERM SIMPLE SLOPES LESS THAN 12 FEET DEEP HAVE A MAXIMUM SLOPE OF 1/2:1</p>  <p>12' max</p> <p>1/2</p> <p>SIMPLE SLOPE SHORT-TERM</p>		
<p>BENCHED EXCAVATIONS LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 3/4:1</p>  <p>20' max</p> <p>3/4</p> <p>SIMPLE BENCH</p>	<p>BENCHED EXCAVATIONS LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 1:1</p>  <p>20' max</p> <p>1</p> <p>SIMPLE BENCH</p>	<p>BENCHED EXCAVATIONS ARE NOT ALLOWED</p>
 <p>20' max</p> <p>3/4</p> <p>MULTIPLE BENCH</p>	 <p>20' max</p> <p>1</p> <p>MULTIPLE BENCH</p>	<p>BENCHED EXCAVATIONS ARE NOT ALLOWED</p>
<p>SUPPORTED OR SHIELDED EXCAVATIONS LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 3/4:1.</p> <p>Support or shield excavation</p>  <p>20' max</p> <p>18" min.</p> <p>3/4</p> <p>SUPPORTED LOWER PORTION</p>	<p>SUPPORTED OR SHIELDED EXCAVATIONS LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 1:1.</p> <p>Support or shield excavation</p>  <p>20' max</p> <p>18" min.</p> <p>1</p> <p>total height of verticle side</p> <p>SUPPORTED LOWER PORTION</p>	<p>SUPPORTED OR SHIELDED EXCAVATIONS LESS THAN 20 FEET DEEP WILL HAVE A MAXIMUM SLOPE OF 1-1/2:1.</p> <p>Support or shield excavation</p>  <p>20' max</p> <p>18" min.</p> <p>1-1/2</p> <p>total height of verticle side</p> <p>SUPPORTED LOWER PORTION</p>
<p>THE SUPPORT OR SHIELD MUST EXTEND AT LEAST 18 INCHES ABOVE THE VERTICAL SIDE.</p>	<p>THE SUPPORT OR SHIELD MUST EXTEND AT LEAST 18 INCHES ABOVE THE VERTICAL SIDE.</p>	<p>THE SUPPORT OR SHIELD MUST EXTEND AT LEAST 18 INCHES ABOVE THE VERTICAL SIDE.</p>


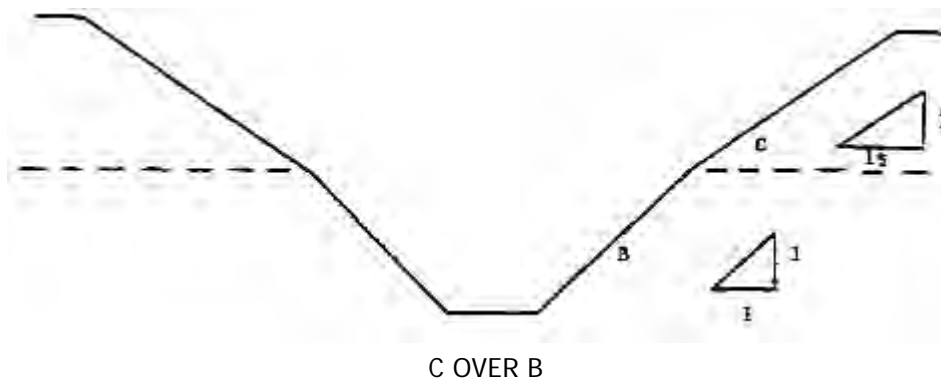
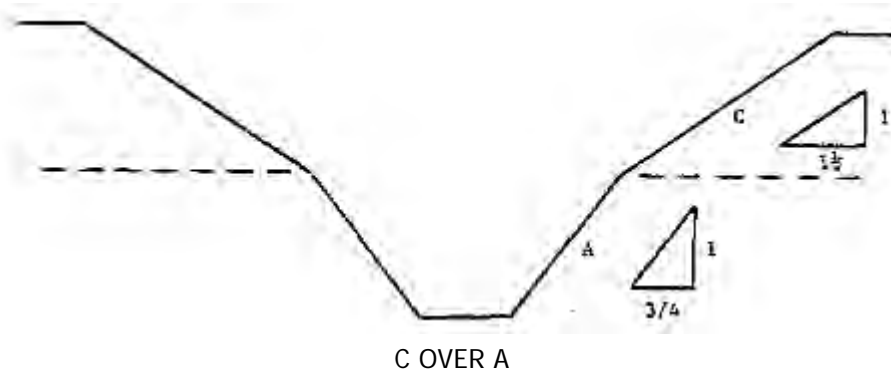
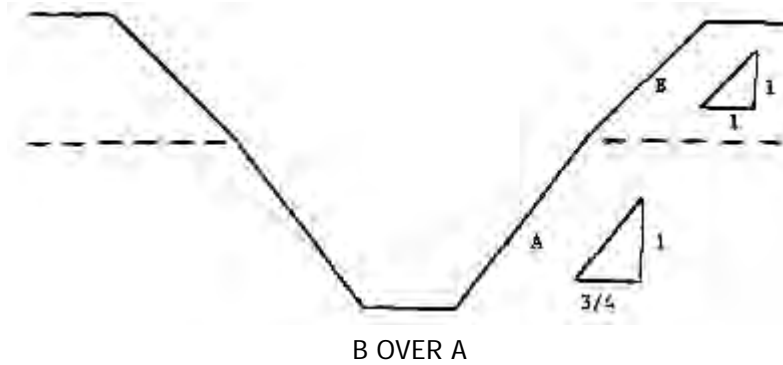

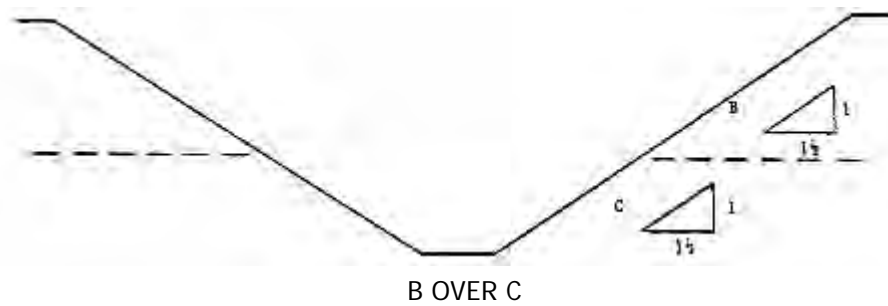
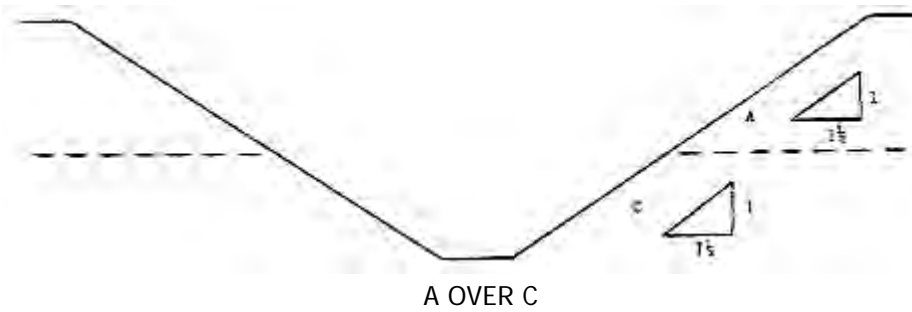
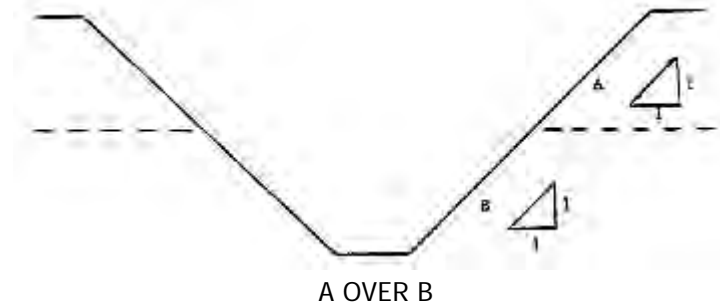
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Table 3 Excavations Made in Layered Soils


1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



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2. All other sloped excavations shall be in accordance with the other options permitted in §1926.652(b).

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6. REFERENCES / RELATED DOCUMENTS:

29 CFR 1926 Subpart P, Excavations

CP002 – Risk Analysis Site Specific Health and Safety Program

CP003 – Personal Protective Equipment Program


CP008 – Confined Space Entry Program

CP009 – Health and Safety Training Program

7. APPENDICES

Forms

- A. TRC Site-Specific Excavation Plan
- B. TRC Pre-Excavation Checklist
- C. TRC Excavation Inspection Form
- D. TRC Protective Systems Selection Flow Chart

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FORMS

- A. TRC SITE-SPECIFIC EXCAVATION PLAN
- B. TRC PRE-EXCAVATION CHECKLIST
- C. TRC EXCAVATION INSPECTION FORM
- D. TRC PROTECTIVE SYSTEMS SELECTION FLOW CHART



Site Specific Excavation Plan

Project Name:

Project #:

Location:

Date:

Company:

Submitted By:

Surface Encumbrances

Have Surface encumbrances that may create a hazard been removed or supported?

☐ Yes

☐ N/A

Underground Installations

Have Utility companies or owners been contacted? ☐ Yes ☐ N/A

By whom:

Work Order #:

Date:

When excavation operations approach the estimated location of underground installations, how will the exact location of the installations shall be determined?

☐ Probing

☐ Hand digging

☐ Detecting equipment

☐ Other

How will underground installations be protected?

☐ Support

☐ Removal

☐ Other

Access and Egress

Will structural ramps be used? ☐ Yes ☐ N/A

Designed by a competent person? ☐ Yes ☐ N/A

Will excavations be 4 feet in depth or more? ☐ Yes ☐ N/A

Means of egress (requiring no more than 25 feet of lateral travel) ☐ Yes ☐ N/A

☐ Stairway(s)

☐ Ramp(s)

☐ Ladder(s)

☐ Other

Exposure to vehicular Traffic? ☐ Yes ☐ N/A (If yes workers shall wear warning vests or other suitable garments.)

Exposure to falling loads? ☐ Yes ☐ N/A

☐ No workers permitted underneath loads

☐ Workers shall be required to stand away from any vehicle being loaded or unloaded. (Operators may remain in cabs)

Warning System for Mobile Equipment

Will mobile equipment operated adjacent to, or approaching the edge of, excavations have a clear and direct view of the edge of the excavation?

☐ Yes ☐ N/A If yes what warning system will be utilized?

☐ Barricade(s)

☐ Hand Signals

☐ Stop logs

☐ Other

Hazardous Atmospheres

Can oxygen deficiency or a hazardous atmosphere reasonably be expected to exist? ☐ Yes ☐ N/A

If yes, how will atmospheres in excavations greater than 4 feet in depth be tested?

If atmospheres contain less than 19.5% oxygen or other hazardous substance how will it be remediated?

When controls are intended to reduce the level of contaminants to acceptable levels, testing shall be conducted:

☐ Continuously ☐ Periodically

Will emergency rescue equipment be utilized? ☐ Yes ☐ N/A If yes what type?

☐ SCBA

☐ Harness and line

☐ Basket stretcher

☐ Other

Site Specific Excavation Plan

Water Accumulation

Will workers work in excavations in which there is accumulated water? ☐ Yes ☐ N/A

If yes is water controlled or prevented from accumulating by water removal equipment? ☐ Yes ☐ N/A

Equipment type:

Competent Person:

Does excavation work interrupt the natural drainage of surface water (such as streams)? ☐ Yes ☐ N/A

Method used to divert water:

Stability of Adjacent Structures

Will the stability of adjacent structures be endangered by excavation operations? ☐ Yes ☐ N/A

If yes, what type of support structure will be used?

☐ Shoring

☐ Bracing

☐ Underpinning

☐ Other

If yes, but support structures will not be used, one of the following must apply:

☐ The excavation is in stable rock

☐ A registered professional engineer has determined that such work will not pose a hazard.

Name of registered professional engineer:

Protection from Loose Rock or Soil

How will workers be protected from materials or equipment that could fall or roll into excavations?

☐ Material placed > 2 feet from edge ☐ Retaining devices

Inspections

☐ Inspections of all excavations, adjacent areas and protective systems shall be made by a competent person.

☐ Inspections shall be conducted by the competent person daily, prior to the start of work and as needed throughout the shift.

Inspections shall be documented on a Daily Excavation Inspection Form.

☐ Inspections shall be made after every rainfall or other hazard increasing occurrence.

☐ Where the competent person finds evidence of hazardous conditions, workers shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Fall Protection

Will excavations be 6 feet or greater in depth? ☐ Yes ☐ N/A

If yes, fall protection will consist of:

☐ Barricades

☐ Fall restraint

☐ Harness

☐ Other

Will workers be required or permitted to cross over excavations? ☐ Yes ☐ N/A

If yes, guardrails shall be provided.

SIGNATURES

Supervisor

General Supervisor

Project/Construction Manager

Safety Representative



Pre-Excavation Checklist



Project Name:

Project #:

Location:

Date:

Company:

One Call #

Submitted By:

The following procedures are mandatory. Failure to complete this check list could result in disciplinary action or termination:

Complete a pre-excavation walk-out of the entire job site. Your objective is to visually inspect the dig area to ensure all utilities are marked. Look for obvious signs of utilities in the immediate work area that may not be marked such as, above-ground pedestals, gas meters, man-hole covers, drains, or utility poles with cable risers. If you find these indicators and suspect that there is an unmarked utility DO NOT PROCEED. Call your General Foreman or Locate Ticket Coordinator immediately.

When you have completed your walk-out, complete the following check list:

1. Verify that the One-Call ticket covers the 'Scope of work' and 'Work to begin' date:
I have verified the One-Call ticket covers the 'Scope of work' & 'Work to begin' date ☐
2. What marked utilities did you observe?
☐ Gas (Yellow) ☐ Electric (Red) ☐ Telephone (Orange) ☐ Cable TV (Orange) ☐ Water (Blue) ☐ Sewer (Green)
3. Based on visual observation, did you see any obvious signs of unmarked utilities in the immediate work area?
☐ Yes ☐ No If Yes, please identify?
☐ Gas (Yellow) ☐ Electric (Red) ☐ Telephone (Orange) ☐ Cable TV (Orange) ☐ Water (Blue) ☐ Sewer (Green)
4. I have notified my Supervisor and Locate Ticket Coordinator ☐
5. Photograph the entire proposed work area including all locate marks.
I have photographed the entire site including existing locate/markings prior to excavation ☐
6. Advise your crew members of the following: If they have to cross a marked Utility they must HAND DIG ONLY within 18" of the locate marks. For gas lines add half the diameter of the buried facility to the 18". If necessary, dig a test-hole (pothole) using hand tools to determine the location of the facility.
I have advised my crew of this rule ☐
7. When possible, all directional boring / drilling routes must be potholed every 50-80 feet prior to drilling.
I have advised my crew accordingly and test-holes (potholes) have been dug ☐

~~~~~ RESPECT THE MARKS! ~~~~~

## IN THE EVENT OF DAMAGE

- Notify your Supervisor and Locate Ticket Coordinator
- Complete the TRC Incident Notification Form
- Photograph entire area and damage location

## PHOTOGRAPHY TIPS

- Make sure the correct date & time stamp is active on your camera
- Photograph the excavation itself (damage location) and cable depth (include tape measure in hole)
- Take photos from multiple vantage points and of surrounding area (360 degrees)
- If the utility was miss-marked, photograph the locate marks/flags (include tape measure in photo)
- If the utility was not marked, photograph the entire area and approaches to the cut site
- Show a quantifiable location/address (street sign, house number, mail box number etc.)

# Excavation Flow Diagram

Project Name:

Location:

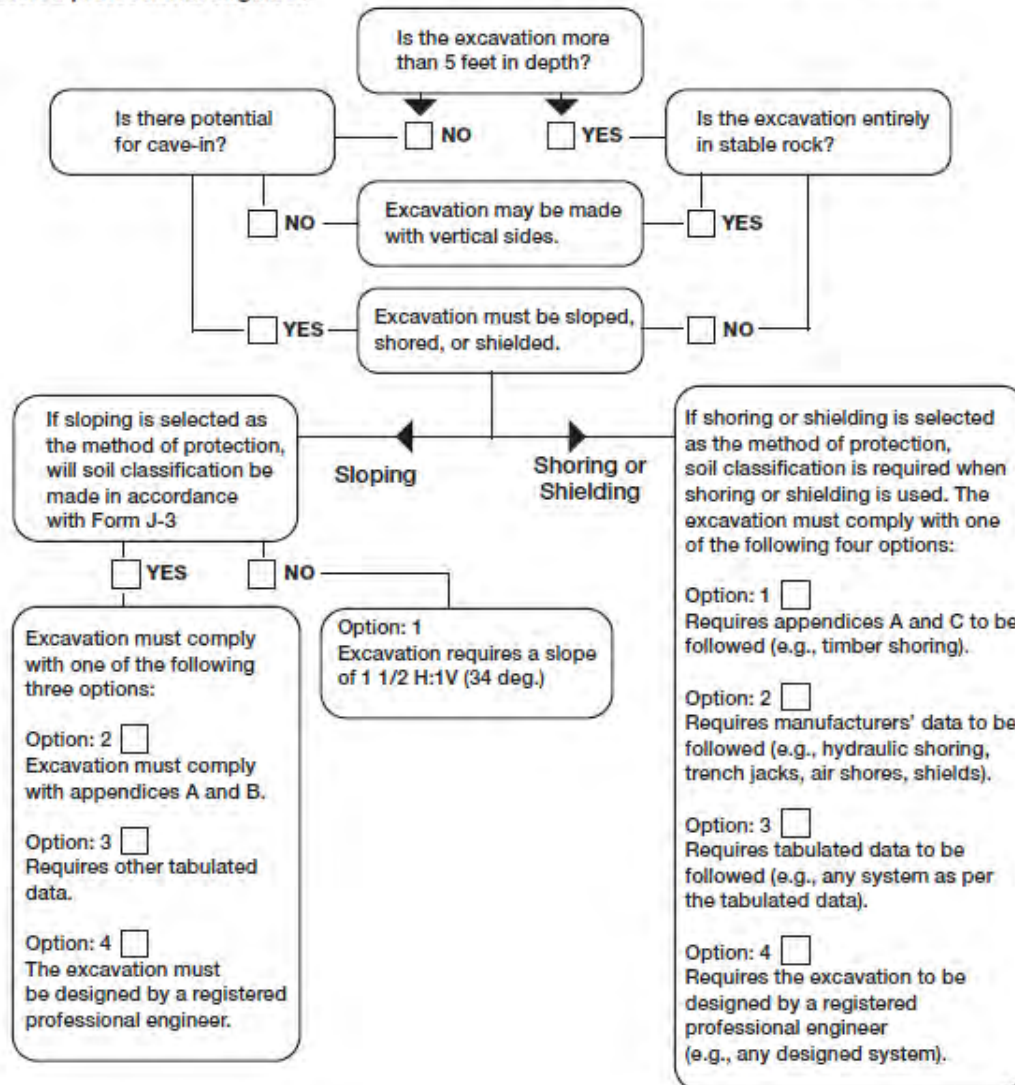
Company:

Submitted By:

Project #:

Date:

The following is a graphic summary of the requirements for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in depth must be designed by a registered professional engineer.





# Excavation Daily Inspection

Project Name: \_\_\_\_\_

Project #: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Company: \_\_\_\_\_

Submitted By: \_\_\_\_\_

|                                                  |                                                   |                                                                                                                            |
|--------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Depth: _____                                     | Width: _____                                      | Date Opened: _____                                                                                                         |
| Soil classification:                             | <input type="checkbox"/> A                        | <input type="checkbox"/> B <input type="checkbox"/> C                                                                      |
| <b>Indicate how the classification was made:</b> |                                                   |                                                                                                                            |
| Manual test(s)                                   |                                                   |                                                                                                                            |
| a) plasticity                                    | _____                                             | _____                                                                                                                      |
| b) dry strength                                  | _____                                             | _____                                                                                                                      |
| c) thumb penetration                             | _____                                             | _____                                                                                                                      |
| d) pocket penetrometer                           | _____                                             | _____                                                                                                                      |
| e) other                                         | _____                                             | _____                                                                                                                      |
| Visual test(s) Do as many as possible            |                                                   |                                                                                                                            |
| a) Spoil pile                                    | <input type="checkbox"/> Cohesive Soil            | <input type="checkbox"/> Granular Soil                                                                                     |
| b) Trench Side                                   | <input type="checkbox"/> Remains in clumps        | <input type="checkbox"/> Breaks up easily                                                                                  |
|                                                  | <input type="checkbox"/> Stands vertical >2 hours | <input type="checkbox"/> Sloughs into trench                                                                               |
| <b>The excavation is properly (circle one):</b>  |                                                   |                                                                                                                            |
| Shored/Shielded (indicate type of shoring)       | <input type="checkbox"/> closed                   | <input type="checkbox"/> open <input type="checkbox"/> wood <input type="checkbox"/> metal <input type="checkbox"/> shield |
| Sloped/benched (indicate the slope)              | <input type="checkbox"/> vertical sides           | <input type="checkbox"/> 3/4:1 <input type="checkbox"/> 1:1 <input type="checkbox"/> 1 1/2: 1 <input type="checkbox"/> 2:1 |

| Excavation Checklist:                                                                            | Morning                                                  | Mid-Day                                                  | Afternoon                                                |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| <b>Time:</b>                                                                                     | _____                                                    | _____                                                    | _____                                                    |
| <b>Weather:</b>                                                                                  | _____                                                    | _____                                                    | _____                                                    |
| Was atmospheric testing required?                                                                | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Was atmospheric testing done?                                                                    | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Is the spoil pile back 2' from the edge?                                                         | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Have surface encumbrances been removed?                                                          | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Are there any signs of sloughing or cave-in?                                                     | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Is there water accumulation in the bottom?                                                       | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Are there vibration sources near the excavation?                                                 | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Is there adequate access/egress (ladder, ramp, etc.)                                             | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| Has the soil been disturbed previously?                                                          | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| <b>Sides</b>                                                                                     | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| <b>Top</b>                                                                                       | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |
| If the excavation is > 20 feet deep, have engineering designs been documented and complied with? | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no | <input type="checkbox"/> yes <input type="checkbox"/> no |

## SIGNATURES

Supervisor

General Supervisor

Project/Construction Manager

Safety Representative

## **APPENDIX B**

### **STORMWATER POLLUTION PREVENTION PLAN (SWPPP)**

# **STORM WATER POLLUTION PREVENTION PLAN**

*Prepared for*

## **LILLARD RANCH PROPERTY - ASH REMEDIATION PROJECT WOODLAND, CALIFORNIA**

### **RISK LEVEL 1**

Legally Responsible Person [LRP]:

Larry O'Neal  
530-661-6095

WOODLAND BIOMASS POWER, LTD.  
414 S. Main Street, Suite 600  
Ann Arbor, MI 48104

Project Address:

24998 County Road 102  
Davis, California

*SWPPP Prepared by:*

**TRC**  
9685 Research Drive  
Irvine, California  
Christian Herencia, PE, QSD/QSP

March 30, 2017

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## Qualified SWPPP Developer

---

### Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: Lillard Ranch Property – Ash Remediation Project

Project Number/ID [if applicable] \_\_\_\_\_

“This Storm Water Pollution Prevention Plan and Attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below.”

*"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*



QSD Signature

March 7, 2017

Date

Christian Herencia

QSD Name

#000389

QSD Certificate Number

Senior Project Engineer, TRC Solutions Inc. (TRC)

Title and Affiliation

(858) 505-8881 ext. 14923

Telephone Number

[CHerencia@TRCSolutions.com](mailto:CHerencia@TRCSolutions.com)

Email

## Legally Responsible Person

---

Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: Lillard Ranch Property – Ash Remediation Project

Project Number/ID  
[if applicable]

\_\_\_\_\_

*"I certify under penalty of law that this document and all Attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

\_\_\_\_\_  
*Signature of Legally Responsible Person  
(or Approved Signatory)*

\_\_\_\_\_  
*Date*

Larry O'Neal  
*Name of LRP or Approved Signatory*

Woodland Biomass Power, Ltd.  
*Company*

\_\_\_\_\_  
*Title*

(530)-661-6095  
*Telephone Number*

[larry.oneal@dteenergy.com](mailto:larry.oneal@dteenergy.com)

\_\_\_\_\_  
*Email*

## Section 1 SWPPP Requirements

---

### 1.1 INTRODUCTION

This Construction Storm Water Pollution Prevention Plan (SWPPP) is prepared for the Ash Removal at Lillard Ranch Property (Site) located at 24988 County Road 102, Davis, California, as presented in **Figure 1**. The SWPPP is in compliance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) for Storm Water Discharges Associated with Construction Activity, Order No. 2009-0009-DWQ, NPDES No. CAS000002 as amended by 2010-0014-DWQ and 2012-006-DWQ. This CGP, enforced by the State Water Resources Control Board (SWRCB), regulates pollutants in discharges of storm water associated with construction activity to surface waters. A copy of the CGP is located in **Appendix A**.

Uncontrolled runoff from construction sites is a water quality concern because of the adverse effects that sedimentation, and the pollutants that attach to it, can have on local water bodies. Numerous studies have shown that the amount of sediment transported by storm water runoff from construction sites with no controls is significantly greater than from sites with controls. In addition to sediment, construction activities can yield pollutants such as pesticides, petroleum products, construction chemicals, solvents, asphalts, and acids that can contaminate storm water runoff. During storms, construction sites can be source of sediment-laden runoff, which has been shown to result in the loss of habitat for fish and other aquatic species.

This SWPPP is designed to be a working document and will be modified as appropriate and as necessary during the life of the project to address changes in construction or operations that affect the discharge of pollutants from the Site. Therefore, the objectives of this SWPPP, along with its Attachments covering project-specific storm water pollutant prevention practices, are as follows:

- Identify all pollutants and their sources, including sources of sediment that can affect the quality of storm water discharges associated with construction activity (storm water discharges) from the construction Site and ensure they are controlled;
- Where not otherwise required to be under a Regional Water Quality Control Board (RWQCB) permit, identify and either eliminate, control, or treat all non-storm water discharges;
- Select Site Best Management Practices (BMPs). BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard;
- Develop a maintenance schedule for sediment and erosion control BMPs installed during construction, designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs);
- Present calculations and design details as well as BMP controls for site run-on;
- Identify stabilization BMPs installed to reduce or eliminate pollutants after construction is completed.

- Identify a sampling and analysis strategy, and sampling schedule for discharges have been discovered through visual observations to be potentially contaminated by pollutants not visually detectable in the runoff.

In addition to, and as part of this SWPPP, contractors will comply with applicable regulations in effect or placed into effect during the term of the contract between all contractors and Woodland Biomass Power, Ltd., being either the laws of municipal government within a state, state law, federal statutes, as any all of them apply. As such, all contractors working at the Site will be held to the requirements and stipulations of this SWPPP.

The level of sediment and receiving water risks are calculated [as described in the Construction General Permit (CGP)] to determine the overall Risk Level for a project. The overall Risk Level determines the frequency of inspections, reporting and sampling. This SWPPP is prepared in accordance with the **Risk Level 1** requirements of the CGP. See Risk determination in **Appendix C**.

## 1.2 PERMIT REGISTRATION DOCUMENTS

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Storm Water Multi Application and Report Tracking System (SMARTS) by the Legally Responsible Person (LRP), or authorized personnel (i.e., Approved Signatory) under the direction of the LRP. The project-specific PRDs include:

1. Notice of Intent (NOI);
2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination);
3. Site Map;
4. Annual Fee;
5. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal); and
6. SWPPP.

The Site map can be found as **Figure 1**. Copy of the submitted PRDs shall also be kept in **Appendix E** along with the Waste Discharge Identification (WDID) confirmation.

## 1.3 SWPPP AVAILABILITY AND IMPLEMENTATION

The SWPPP shall be available at the construction Site during working hours while construction is occurring and shall be made available upon request by the Water Board or agency inspectors. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

The SWPPP shall be implemented concurrently with the start of ground disturbing activities.

## 1.4 SWPPP AMENDMENTS

The SWPPP will be amended by the Qualified SWPPP Developer (QSD) when the following conditions are encountered:

- If there is a General Permit violation.



- When there is a reduction or increase in total disturbed acreage
- BMPs do not meet the objectives of reducing or eliminating pollutants in storm water discharges.
- There is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4);
- When there is a change in the project duration that changes the project's risk level; or
- As deemed necessary by the QSD.

All amendments to the SWPPP must be documented. When amended or revised, the SWPPP will include a list of the date of initial preparation, the date of each amendment and be signed by the QSD. All amendments will be dated and remain in the SWPPP. Blank amendment forms and the Amendment Log are located in **Appendix D**.

The following items will be included in all amendments:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP, if any; and
- The new proposed or revised BMP.

## **1.5 RETENTION OF RECORDS**

All SWPPP related documents will remain with the SWPPP. This includes annual reports, inspection reports, sampling records and all correspondence on this project regarding the SWPPP. The contractor will maintain a paper or electronic copy of all required records for three years from the date of project acceptance. These records will be available at the Site until construction is completed.

The LRP or their designee will manage all storm water documentation related to this project as described under the SWPPP until such a time that the owner notifies the SWRCB of a change in this process. The permittee shall furnish the RWQCB, SWRCB, or U.S. Environmental Protection Agency (EPA), within a reasonable time, any requested information to determine compliance with the CGP. The RWQCB may require records to be retained for longer periods.

In addition, the SWPPP will remain on Site while the Site is under construction during working hours, commencing with the initial construction activity and ending with termination of coverage under the CGP. All storm water correspondence related to this project will be kept in the applicable Appendices of this SWPPP.

## **1.6 REQUIRED NON-COMPLIANCE REPORTING**

Reportable discharges or other violations of the CGP will be properly documented. Reportable discharges and violations include the following:

- Violations identified by the RWQCB during inspections; and

- Discharges which contain a hazardous substance in excess of reportable quantities established in 40 CFR §§ 117.3 and 302.4.

If a non-authorized discharge or other violation occurs, QSP will immediately notify the QSD and the LRP. The Regional Water Board will be notified within seven days and a written violation report will be prepared and submitted to the Regional Water Board within 30 days of identifying the non-compliance issue. Once observed, corrective measures will be implemented immediately following the observed discharge or non-compliance. Paper copies of any Non-Compliance Reporting and Corrective Actions will be documented and retained in **Appendix F** of the SWPPP as applicable.

The non-compliance report to the Regional Water Board will contain the following items:

- The date, time, location, nature of operation and type of unauthorized discharge.
- The cause or nature of the notice or order.
- The control measures (BMPs) deployed before the discharge event, or prior to receiving notice or order.
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

## 1.7 ANNUAL REPORT

By September 1 of each year, an Annual Report will be prepared and submitted electronically through the SWRCB SMARTS system. The Annual Report will be certified by the LRP (or approved signatory). The following storm water monitoring information (if applicable) will be included in the Annual Report:

1. A summary and evaluation of all sampling and analysis results, including original laboratory reports;
2. The analytical method(s), method reporting unit(s), and Method Detection Limits (MDLs) of each analytical parameter (analytical results that are less than the MDL must be reported as “less than the MDL” or “<MDL”);
3. A summary of all corrective actions taken during the project;
4. Identification of any compliance activities or corrective actions that were not implemented;
5. A summary of all violations of the CGP;
6. The individual(s) who performed facility inspections, sampling, visual observations (inspections), and/or measurements;
7. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation;
8. The visual observations and sample collection exception records and reports; and
9. Training documentation.

## **1.8 CHANGES TO PERMIT COVERAGE**

The CGP allows a permittee to reduce or increase the total acreage covered under the WDID# when: a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Any changes to the permit acreage will be documented by the permittee and include modifications PRDS (i.e. Site maps, SWPPP revisions as appropriate, and certifications) in accordance with requirements of the CGP within 30 days of a reduction or increase in total disturbed area. Updates to PRDs will be included as **Appendix E** of this SWPPP.

## **1.9 FINAL STABILIZATION**

When all conditions on-site meet those described in Section II.D.1 of the Construction CGP, the owner will consider elements identified in this SWPPP complete.

Site “final stabilization” is defined as the state at which the Site will not pose any additional sediment discharge risk than it did prior to the commencement of Construction activity. These conditions include:

- No potential for construction related storm water related pollutants to be discharged into Site runoff;
- Final stabilization has been achieved;
- Construction materials and wastes have been properly removed;
- Compliance with Post-Construction Standards in Section XIII of the CGP has been demonstrated;
- Post-construction storm water management measures have been installed, and a long term maintenance plan has been established; and
- All construction related equipment, materials, and any temporary BMPs no longer required are removed from the Site.

Stabilization will be demonstrated through the following methods:

- Photographs showing 70% final cover method (no computational proof required); or
- Custom method (discharger demonstrates that Site complies with final stabilization).

## **Section 2                      Project Information**

---

### **2.1                      PROJECT AND SITE DESCRIPTION**

#### **2.1.1                      Site Description**

The Lillard Ranch Property – Ash Remediation Project site comprises approximately 80 acres and is located at 24988 County Road 102, in Davis, California. The project site is located on APN: 042-120-010 with an overall ground disturbance of 42 acres, including 37 acres of ash footprint and 5 acres of temporary stockpiling/ash placement area. The project site is located northeast of University of California Davis, as well as, north of the I-80 and east of the SR-113. The project is also bounded by an unnamed tributary on the northeast side and the Wildhorse Golf Club directly south. The closest waterbody is Willow Slough Bypass located one half mile north of the project. The project is located at Latitude: 38.579122 and Longitude: -121.729550 and is identified on the Site map in **Appendix B**.

#### **2.1.2                      Existing Conditions**

The Site is currently in an unincorporated area of Yolo County, CA. In its current configuration, the site is undeveloped with minor vegetation cover and has layers of fill that contain a soil fly ash blend that was applied as a soil amendment. High concentrations of metals and Dioxin/Furan were found in a stockpile of soil mixed with ash, known as the Hostetler pile.

#### **2.1.3                      Existing Drainage**

Review of aerial mapping reveals that the Willow Slough Bypass is approximately one-half mile north from the subject project. Review of the State Water Resource Control Board's Integrated Report (Clean Water Act Section 303 (d) List) for impaired water bodies identifies the Willow Slough Bypass as impaired for Boron, Escherichia coli (E. coli) and Fecal Coliform. The project site grades are very mild and generally drains northeast into a man-made structure. The man-made structure bounding the northeast portion of the property may collect runoff from the vegetated areas surrounding the site. In its current configuration, the man-made structure conveys storm water into channel where water is eventually pumped out of the channel and into a canal that routes water from the south side of the Willow Slough Bypass to the north side and into Davis Wetlands. Therefore, there is no additional impact to the impaired water body. Run-on typically does not enter the project boundary from adjacent parcels due to perimeter berms along County Road 102 on the west and the unnamed tributary surrounding the northeast portion of the project. TRC reviewed the National Flood Insurance Program (NFIP), Flood Insurance Rate Map (FIRM), Map Number 06113C0603G (Effective date June 18, 2010) for Yolo County to determine that the project is located in Flood Zone A.

#### **2.1.4                      Geology and Groundwater**

Based on a review of the Geologic Map of Sacramento Quadrangle, California, published in 1981, the site appears to fall within the Quaternary sediments containing alluvial deposits (including levee and channel deposits). Channel deposits occur along the Sacramento River, Cache Creek, and Putah Creek and can consist of gravel, sand, silt, and clay. Recent stream channel deposits consists of unconsolidated silt, fine-to-medium grained sand, gravel, and occasionally cobbles

deposited in and adjacent to active streams in the sub-basin. Thickness of the younger alluvium ranges from 0 to 150 feet.

### **Basin Boundaries and Hydrology**

The Yolo Sub-basin, located in the southern portion of the Sacramento Valley Basin primarily with Yolo County. It is bounded on the east by the Sacramento River, on the west by the Coast Range, on the north by Cache Creek, and on the south by Putah Creek. The basin is roughly bisected by an anticlinal structure, but otherwise is gently sloping from west to east with elevations ranging from approximately 400 feet at the base of the Coast Range to the west to nearly sea level in the eastern areas. Major cities within the sub-basin include Davis, West Sacramento, Winters and Woodland.

### **Groundwater Level Trends**

Groundwater levels are impacted by periods of drought due to increased groundwater pumping and less surface water recharge (e.g. in the late 1970's and early 1990's), but recover quickly in "wet" years. Long term trends do not indicate any significant decline in water levels, with the exception of localized pumping depressions in the vicinity of the Davis, Woodland and Dunnigan/Zamora areas.

### **Groundwater Depth**

TRC Reviewed the State of California Geotracker website for depth to groundwater information. The most readily available depth to groundwater data was obtained from a closed environmental case approximately 1.25 miles southwest located at 1111 Covell Boulevard, Davis, California. The latest groundwater depth was measured as part of a Screen Level Phase 11 Soil and Groundwater Assessment (2005). The depth to groundwater ranged from 17 to 32 feet below grade level.

## **2.1.5 Project Description**

The Lillard Ranch Property – Ash Remediation Project involves remediation and restoration work on the Site. Between 2,500 to 5,000 yards of fly ash will be removed from the Site. The locations of decision units to be excavated and disposed can be found in the Remedial Grading, Erosion & Sediment Control, and Traffic Control Plans located in **Appendix B**. Decision units where the laboratory results exceed specified criteria for metals are planned to be removed and disposed of at an off-site disposal facility. Decision units containing concentrations of dioxin/furan will be excavated and transported to a temporary onsite stockpile staging area, removed of metal debris, and mixed with native soil to be used for backfill. Excess ash will be spread in non-ash areas and will be disked into the surrounding soil. The location of the stockpile staging area can be found in **Figure 2**. Once remediation is completed and the Site is back to pre-construction conditions, the Property Owner will follow up with vegetation and tree installation as soon as feasible.

### 2.1.6 Developed Condition

Post construction surface drainage will be directed to the northeast. Both pre- and post-construction drainage conditions will be approximately the same. Construction Site estimates for the impervious area occurring before and after the construction area described below:

|                                          |          |
|------------------------------------------|----------|
| Construction site area                   | 80 acres |
| Percent impervious before construction*  | 2%       |
| Runoff coefficient before construction** | 0.26     |
| Percent impervious after construction*   | 2%       |
| Runoff coefficient after construction**  | 0.26     |

\*From Hydrologic Soil Group Map (Assume Hydrologic Soil Group B) in the Yolo County City/County Drainage Manual (Rev. February 2010).

\*\*From Table 20 (Assume Agricultural Land Use) in the Yolo County City/County Drainage Manual (Rev February 2010).

## 2.2 STORMWATER RUN-ON FROM OFFSITE AREAS

Run-on from offsite areas typically does not enter the project boundary from adjacent parcels due to perimeter berms along County Road 102 on the west. Fiber rolls will be placed along the northeast portion of the project to prevent runoff from entering into a man-made structure.

## 2.3 FINDINGS OF THE CONSTRUCTION SITE SEDIMENT AND RECEIVING WATER RISK DETERMINATION

The Combined Risk Level was evaluated and it was determined that the project is a **Risk Level 1**. This is based on the Sediment Risk and Receiving Water Risk calculations. The Sediment Risk calculation is based on the Watershed Erosion Estimate that incorporates the following factors, the Rainfall Factor (R), the Soil-Erodibility Factor (K), the hillslope-length factor (L), and a hillslope-gradient factor (S), to determine the sediment loss for the project. Pursuant to the Watershed Erosion Estimate criteria for a project, the project can be classified as follows:

- (1) Sediment Risk is considered “LOW” if the resultant Soil Loss is <15 tons/acres
- (2) Sediment Risk is considered “MEDIUM” if the resultant Soil Loss is  $\geq 15$  and <75 tons/acre,
- (3) Sediment Risk is considered “HIGH” if the resultant Soil Loss is > 75 tons/acre.

The overall predicted sediment loss is approximately 0.209 tons per acre, less than 15 tons per acre. Therefore the Sediment Risk is considered “LOW”. Since the geometry of the site does not allow storm water to discharge to the Willow Slough Bypass, the Receiving Water Risk is also considered “LOW” making this a **Risk Level 1** project. The Risk Determination Worksheet is included in **Appendix C**.

## 2.4 CONSTRUCTION SCHEDULE

The site sediment risk was determined based on construction taking place between March 20, 2017 and May 26, 2017. Modification or extension of the schedule (start and end dates) may affect risk determination and permit requirements. The LRP shall contact the QSD if the schedule changes during construction to address potential impact to the SWPPP.

## **2.5 POTENTIAL CONSTRUCTION ACTIVITY AND POLLUTANT SOURCES**

Construction activity in all phases of the project has the potential to generate pollutants. BMPs will be implemented to control potential pollutants on-site, as described in Section 3.0. Materials that potentially cause pollutants, pollutant type, and visual cues for pollutant identification are listed below.

- Clearing and grubbing;
- Grading; and
- Minor excavations.

## **2.6 IDENTIFICATION OF NON-STORMWATER DISCHARGES**

Non-storm water discharges consist of discharges which do not originate from precipitation events. They can include, but are not limited to discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water. The CGP provides allowances for specified non-storm water discharges that do not cause erosion or carry other pollutants.

Non-storm water discharges into storm drainage systems or waterways, which are not authorized under the CGP and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

The following is a list of activities that may generate non-storm water discharges at the Site. BMPs for these activities are described in Section 3.3.:

- Vehicle and equipment maintenance
- Material delivery and storage
- Soil stockpiling
- Sanitary / septic waste generation

## **2.7 REQUIRED SITE MAP INFORMATION**

The SWPPP Site Location Map (**Figure 1**) shows the project location, surface water boundaries, geographic features, and preliminary and minimum requirements for temporary BMPs to be installed during construction activities. The SWPPP BMP Map (**Figure 2**) shows the construction site perimeter, direction of storm water flow during construction activities, the location of the stockpile staging area, and BMPs to be installed for all construction-related activities, including site stabilization, landscape, and erosion control activities. BMPs will be added or removed from the SWPPP Maps, as necessary, throughout the life of the project.

## Section 3                      Best Management Practices

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### 3.1                      SCHEDULE FOR BMP IMPLEMENTATION

The following summarizes the phasing for implementing BMPs during the remedial construction activities at the Site and the BMPs that may be implemented. BMPs will be implemented, modified, and maintained to reflect the phase of construction and the weather conditions. All BMP details are located in **Appendix G**.

### 3.2                      EROSION AND SEDIMENT CONTROL

Erosion and sediment controls are required by the CGP to provide effective reduction or elimination of sediment related pollutants in storm water discharges and authorized non-storm water discharges from the Site. Applicable BMPs are identified in this section for erosion control, sediment control, tracking control, and wind erosion control.

#### 3.2.1                      Erosion Control

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in storm water runoff. Erosion control BMPs protect the soil surface by covering and/or binding soil particles.

This construction project will implement the following practices to provide effective temporary and final erosion control during construction:

1. Preserve existing vegetation where required and when feasible.
2. The area of soil disturbing operations shall be controlled such that the Contractor is able to implement erosion control BMPs quickly and effectively.
3. Stabilize non-active areas within 14 days of cessation of construction activities or sooner if stipulated by local requirements.
4. Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding or alternate methods.

Prior to the completion of construction, it is recommended to apply permanent erosion control to remaining disturbed soil areas.

Fact Sheets for erosion control BMPs are provided in **Appendix G**. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheet.

**Scheduling (EC-1):** The schedule for this project has been tentatively set from March 20, 2017 through May 26, 2017.

**Preservation of Existing Vegetation (EC-2):** Existing vegetation will not be disturbed on areas where grading (cut and fill) is not performed, this will preserve existing vegetation within the project Site.

Additional information for the BMPs described above is available in fact sheets from the California Stormwater Quality Association's (CASQA) Construction Handbook 2012 and are included in **Appendix G** of the SWPPP.



### 3.2.2 Sediment Controls

Sediment controls are temporary or permanent structural measures that are intended to complement the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. The following sediment controls shall be implemented:

**Silt Fence (SE-1):** A silt fence is composed of a woven material and installed for the purpose of temporarily retaining water and trapping sediment. Silt fence may be used during excavation activities.

**Fiber Rolls (SE-5):** Fiber rolls, or equivalent approved by the Engineer (e.g. straw waddle), are composed of biodegradable natural fibers stuffed into biodegradable open-weave netting and are designed to reduce sediment runoff. Fiber rolls are porous and allow water to filter through the fibers to trap sediment, thereby slowing runoff and reducing sheet and rill erosion. The fiber rolls will be manufactured of only natural fibers and be placed as necessary, to reduce runoff potential down slope of the work area.

**Gravel Bag Berm (SE-6):** Gravel bag berms may be used as a sediment control device to filter out sediment from storm water at the Site. These are to be placed at the base where concentrated flow is observed.

**Stabilized Construction Entrance/Exit (TC-1):** Installation of a shaker/rumble plate, located at points where vehicles leave a construction Site, provides a buffer area where vehicles can drop their mud and sediment to avoid transporting it onto public roads, to control erosion from surface runoff, and to help control dust. A shaker/rumble plate will be located within the ingress and egress of the Site.

**Stabilized Construction Roadway (TC-2):** Existing pavement will remain in the staging area during the project. Vehicles traveling through the staging area can drive on the existing pavement and drop sediment from tires before driving over the Stabilized Construction Entrance/Exit.

**Wind Erosion Control (WE-1):** A water truck will operate as necessary, to prevent visible dust emissions from roadways, and soil disturbing activities (e.g. demolition, excavation, and backfilling activities). Any soil stock piles will be covered with plastic and secured through the use of gravel bags, or other devices to prevent plastic from being carried off by strong gusts.

Fact Sheets for sediment control BMPs are provided in **Appendix G**. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets.

## 3.3 NON-STORM WATER CONTROLS AND WASTE AND MATERIALS MANAGEMENT

### 3.3.1 Non-Storm Water Controls

Non-storm water discharges into storm drainage systems or waterways, which are not authorized under the CGP, are prohibited. Non-storm water discharges for which a separate NPDES permit is required by the local Regional Water Board are prohibited unless coverage under the separate NPDES permit has been obtained for the discharge. The selection of non-storm water BMPs is

based on the list of construction activities with a potential for non-storm water discharges identified in Section 2.6 of this SWPPP.

Non-storm water BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in **Appendix G**.

**Water Conservation Practices (NS-1):** Conserve water usage at the site. Water will be used only as needed for dust control during grading operations, and not to an extent that a surface flow would be created.

**Vehicle and Equipment Cleaning (NS-8):** Onsite cleaning of vehicles will not be performed on Site.

**Vehicle and Equipment Fueling (NS-9):** Vehicle and equipment that must be refueled on-site will be done so by portable tanks away from storm water conveyances (i.e. storm drains, sidewalks, etc.). Spill response materials will be on hand in order to clean up any incidental fuel spills, if they were to occur.

**Vehicle and Equipment Maintenance (NS-10):** Major maintenance is to be performed off-site. Minor maintenance of vehicles may occur on-site. To prevent drips, leaks, or spills of any fluids, drip pans will be used if necessary to catch any discovered leaks until repairs can be made. Exposed soil shall be covered under the maintenance area of the vehicle to eliminate any contact with the soil. All used maintenance materials are to be properly removed from the Site as quickly as possible.

### **3.3.2 Materials Management and Waste Management**

Materials management control practices consist of implementing procedural and structural BMPs for handling, storing and using construction materials to prevent the release of those materials into storm water discharges. The amount and type of construction materials to be utilized at the Site will depend upon the type of construction and the length of the construction period.

Waste management consist of implementing procedural and structural BMPs for handling, storing and ensuring proper disposal of wastes to prevent the release of those wastes into storm water discharges.

Materials and waste management pollution control BMPs shall be implemented to minimize storm water contact with construction materials, wastes and service areas; and to prevent materials and wastes from being discharged off-site. The primary mechanisms for storm water contacting potential pollutants include:

- Direct contact with precipitation
- Contact with storm water run-on and runoff
- Wind dispersion of loose materials
- Direct discharge to the storm drain system through spills or dumping
- Extended contact with some materials and wastes, such as asphalt cold mix and treated wood products, which can leach pollutants into storm water.

**Material Delivery and Storage (WM-1):** BMPs will be installed to prevent storm water from contacting the stored material on-site. All materials are to be stored in designated locations.

**Material Use (WM-2):** Any materials used on-site will be used appropriately so as not to cause potential impacts to storm water runoff.

**Stockpile Management (WM-3):** A sediment control measure or berm to prevent soil from eroding will be installed at the perimeter of the stockpile. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used. Stockpiles shall be covered during the rainy season when not in use.

**Spill Prevention and Control (WM-4):** BMPs are to be implemented to reduce and eliminate potential spills throughout the project. Materials, liquids, and equipment will be stored and handled away from storm drains and storm water conveyances. At least one prominently marked spill kit will be stored at the Site in order to clean up spills as soon as possible. Spills will be properly addressed and remediated as soon as possible. All appropriate agencies are to be notified if the quantity of materials spilled exceeds the allowable limit.

**Solid Waste Management (WM-5):** Trash bins and waste receptacles will be on-site. All trash containers must contain lids and remain closed at the end of each day and during rain events.

**Sanitary-Septic Waste Management (WM-9):** Portable toilets will be on-site. They are to be placed away from discharge locations and areas of concentrated flow during rain events. Regularly scheduled cleanouts of the toilets will reduce the potential of pollutants flowing off-site.

### 3.4 POST CONSTRUCTION STORMWATER MANAGEMENT MEASURES

The CGP requires post-construction runoff reduction. Post-construction BMPs consists of permanent features designated to minimize pollutant discharges, including sediment from the Site after construction has been completed. These BMPs will be implemented by the contractor. Potential post-construction BMPs may include the following:

- Minimization of land disturbance; and
- Minimization of impervious surfaces.

#### Post-construction BMPs:

| Post-construction BMP                               | Responsible Party |
|-----------------------------------------------------|-------------------|
| Revert back to original pre-construction condition. |                   |
| Perimeter Access Road for containment.              |                   |

## Section 4                      BMP Inspection and Maintenance

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### 4.1                      BMP INSPECTION AND MAINTENANCE

This project includes a program to inspect and maintain all BMPS as identified in the SWPPP throughout the duration of the project based on the risk level requirements of the CGP. Routine visual observations and inspections will be performed only during business hours and will be conducted weekly for the duration of the project. Inspections will be performed by the Qualified SWPPP Practitioner (QSP). For each inspection required, the QSP will complete an inspection report. Blank inspection reports are located in **Appendix H**.

Inspections of the construction Site will be performed:

- Prior to an anticipated storm events to ensure the BMPs are properly installed and maintained,
- Every 24 hours during extended storm events to evaluate BMPs for adequacy, proper implementation and whether additional BMPs are required; and
- After storm events to identify areas contributing to discharge of storm water associated with construction activity and to assure that the BMPs have functioned adequately.

*Note: An inspection is triggered by a 50% chance of rain per the National Oceanographic and Atmospheric Administration <http://www.weather.gov/>.*

Corrective maintenance to BMPs will be within 72 hours after being identified in the inspection report and completed within seven days of identifying the item, prior to the next rain event, and as soon as feasible if conditions warrant. The QSP is to initial and date each time when complete as indicated in the inspection report. All completed inspection reports are to be retained in the SWPPP under **Appendix H**.

Non-storm water discharges will be monitored during weekly inspections. If a discharge of non-storm water is observed, measures will be taken to identify the source and stop the flow of water. All observations and any corrective actions will be documented. The observational data will be reviewed to determine if any modification of BMP measures is necessary. These steps will be taken to maintain compliance with the conditions of the CGP, and serve as the basis for the Annual Report.

### 4.2                      RAIN EVENT ACTION PLANS

This project is categorized as a Risk Level 1. Therefore, a Rain Event Action Plan is not required for the Site at this time. However, any weather tracking information can be retained in **Appendix L** of the SWPPP.

## Section 5                      Training

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An employee awareness-training program will be implemented to inform Site personnel at all levels of responsibility of the components and goals of this SWPPP. The purpose of the training program is to ensure that the necessary information is disseminated to all parties responsible for implementing the SWPPP. Section VII of the CGP requires that all elements of the SWPPP be developed by a QSD and implemented by a QSP. The training qualifications of the QSD and QSP will be provided in **Appendix I**. The QSP may delegate tasks to trained employees provided adequate supervision and oversight is provided. All training qualifications and activities will be retained in **Appendix I** and be submitted in the Annual Report.

Personnel at the Site shall receive training appropriate for individual roles and responsibilities on the project. Training will:

- Address how to implement each component of the SWPPP, including how and why tasks are to be implemented;
- Include inspections, spill prevention and response, good housekeeping, material management practices, implementation of BMPs, and record keeping procedures;
- Be both formal and informal, occur on an ongoing basis when it is appropriate and convenient, and will include training/workshops offered by the SWRCB, RWQCB, or other locally recognized agencies or professional organizations; and
- Be documented by having attendees sign an attendance sheet.

**Appendix J** identifies personnel responsible for implementing specific items in the SWPPP for the project. Identified personnel shall be responsible for providing training information and subsequently completing the training logs shown in **Appendix I**, which identifies the site-specific storm water topics covered as well as the names of Site personnel who attended the meeting.

## Section 6 Responsible Parties and Operators

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### 6.1 RESPONSIBLE PARTIES

The authorized representatives assigned to this project are identified in **Appendix J**, including project Site personnel who will be responsible for SWPPP activities (QSD and QSP). This list includes the names of the individuals granted authority to sign permit-related documents.

Responsible parties who perform training shall record the date, name of individuals, and retain a copy training certificates or other verification of training certificates or other verification of training as applicable and will include them in **Appendix I**.

The QSP shall have primary responsibility and significant authority for the implementation, maintenance and inspection/monitoring of SWPPP requirements. The QSP will be available at all times throughout the duration of the project. Responsibilities of the QSP include:

- Implementing all elements of the SWPPP, including but not limited to:
  - Ensuring all BMPs are implemented, inspected, and properly maintained;
  - Performing non-storm water and storm water visual observations and inspections;
  - Performing non-storm water and storm sampling and analysis, if required;
  - Performing routine inspections and observations; and
  - Implementing non-storm water management, and materials and waste management activities such as: monitoring discharges; general Site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems.
- The QSP may delegate these inspections and activities to an appropriately trained employee, but shall ensure adequacy and adequate deployment.
- Ensuring elimination of unauthorized discharges.
- The QSPs shall be assigned authority by the LRP to mobilize crews in order to make immediate repairs to the control measures.
- Coordinate with the Contractor(s) to assure all of the necessary corrections/repairs are made immediately and that the project complies with the SWPPP, the General Permit and approved plans at all times.
- Notifying the LRP or Authorized Signatory immediately of off-site discharges or other non-compliance events.

## 6.2 CONTRACTOR LIST

The CGP requires that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the QSP. The list is included as **Appendix K** of this SWPPP. The list includes telephone numbers and work addresses and the specific areas of responsibilities of each subcontractor and emergency contact numbers. The prime contractor contact information is listed below.

### **Prime Contractor Contact**

Name:

Title:

Company:

Address:

Phone Number:

Number (24/7):

## Section 7 Construction Site Monitoring Program

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### 7.1 Purpose

The CGP requires that a written site-specific CSMP be developed by each discharger prior to the commencement of construction activities, and be revised as necessary to reflect project revisions and that the CSMP be included within the SWPPP. This CSMP has been developed to meet the specific requirements and objectives identified for a **Risk Level 1** Site.

The objectives of the CSMP are as follows:

1. To demonstrate that the site is in compliance with the Discharge Prohibitions of the CGP;
2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
3. To determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges;
4. To measure the effectiveness of BMPs in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

### 7.2 Applicability of Permit Requirements

This project has been determined to be a **Risk Level 1** project. The CGP identifies the following types of monitoring as being applicable for a **Risk Level 1** project.

- Visual inspections of BMPs;
- Visual monitoring of the site related to qualifying storm events;
- Visual monitoring of the site for non-storm water discharges;
- Sampling and analysis of construction site runoff for non-visible pollutants when applicable; and
- Sampling and analysis of construction site runoff as required by the Regional Water Board when applicable.

### 7.3. Weather and Rain Event Tracking

Visual monitoring and inspections requirements for **Risk Level 1** are triggered by a qualifying rain event. The General Permit defines a qualifying rain event as any event that produces ½ inch of precipitation. A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying storm events.

#### 7.3.1 Weather Tracking

The QSP should daily consult the National Oceanographic and Atmospheric Administration (NOAA) for the weather forecasts. These forecasts can be obtained at (<http://www.weather.gov/>). Weather reports should be printed and maintained in **Appendix L** of the SWPPP.

The Quantitative Precipitation forecast that provides predictions for amount of rainfall in 6-hour intervals during the next seven days for Davis is available at:



### **7.3.2 Rain Gauges**

The QSP shall install a rain gauge on the project site. The gauge will be installed in an open area away from obstructions such as trees or overhangs. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Make sure that the top of the gauge is level. Make sure the post is not in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc. Amounts of storm water accumulated in the rain gauge will be recorded daily and will be read at approximately the same time every day. Rain gauge readings will be retained on the BMP inspection reports. Log rain gauge readings in CSMP Attachment 1 “Weather Records”, found in **Appendix L**. Once the rain gauge reading has been recorded, accumulated rain will be removed from the gauge, and the gauge returned to use.

### **7.4 Monitoring Locations**

The entire Site will be monitored during construction activities for non-storm water discharges and authorized storm water discharges and BMP effectiveness. If there is a change in construction activities, or a change in the construction footprint that may affect the appropriateness of the sampling location, the sampling point shall be revised accordingly. All such revisions shall be implemented as soon as feasible and documented as part of a SWPPP amendment. Temporary changes that result in a one-time additional sampling location do not require a SWPPP amendment.

### **7.5 Safety and Monitoring Exemptions**

Safety practices for sample collection will be in accordance with the industry standard health and safety plans prepared by a qualified individual and/or a health and safety plan prepared by the contractor and approved by the QSD. It is anticipated that sampling would be performed during the typical work window [daylight hours between 7:00 AM to 4:00 PM] on Monday through Friday, unless otherwise requested by the Regional Board. To abide by health and safety practices, sampling personnel will not be required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

If monitoring (visual monitoring or sample collection) of the site is unsafe because of the dangerous conditions noted above then the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be filed in CSMP Attachment 2 “Monitoring Records” found in **Appendix L**.

### **7.6 Visual Monitoring**

This project is categorized as **Risk Level 1**. Therefore, a visual inspection of storm water discharges at discharge locations must be performed two business days (48 hours) after each qualifying rain event to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly. The observers will conduct visual inspections during business hours and record the time, date, and rain gauge reading

of all qualifying rain events. Within two business days (48) prior to each qualifying rain event, the observers will visually inspect for the following:

- All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger will implement appropriate corrective actions.
- Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

For the visual observations (inspections) described above, the observers will inspect the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

On-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations. These documents will be maintained in CSMP Attachment 2 “Monitoring Records” in **Appendix L**.

**Table 7.1 Visual Monitoring and Inspection Schedule**

| Type of Inspection                             | Frequency                                          |
|------------------------------------------------|----------------------------------------------------|
| <i>Routine Inspections</i>                     |                                                    |
| BMP Inspections                                | Weekly                                             |
| BMP Inspections – Tracking Control             | Daily                                              |
| BMP Inspections – Wind Erosion                 | Daily                                              |
| Non-Storm Water Discharge Observations         | Quarterly during daylight hours                    |
| <i>Rain Event Triggered Inspections</i>        |                                                    |
| Site Inspections Prior to a Qualifying Event   | Within 48 hours of a qualifying event <sup>1</sup> |
| BMP Inspections During an Extended Storm Event | Every 24-hour period of a rain event               |
| Site Inspections Following a Qualifying Event  | Within 48 hours of a qualifying event              |

Note:

1. A new qualifying rain event is identified when no precipitation is observed in a 48-hour period.

### **7.6.1 Routine BMP Inspections**

Inspections of BMPs are conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

### **7.6.2 Non-Storm Water Discharge Observations**

Each drainage area will be inspected for the presence of or indications of prior unauthorized and authorized non-storm Water discharges. Inspections will record:

- Presence or evidence of any non-storm water discharge (authorized or unauthorized);

- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

### **7.6.3      *Rain-Event Triggered Observations and Inspections***

Visual observations of the Site and inspections of BMPs are required prior to a qualifying rain event; following a qualifying rain event, and every 24-hour period during a qualifying rain event. Pre-rain inspections will be conducted after consulting NOAA and determining that a precipitation event with a 50 percent or greater probability of precipitation has been predicted.

### **7.6.4      *Visual Monitoring Procedures***

Visual monitoring shall be conducted by the QSP or staff trained by and under the supervision of the QSP.

The name(s) and contact number(s) of the site visual monitoring personnel are listed below and their training qualifications are provided in **Appendix I**.

Assigned inspector: \_\_\_\_\_ Contact phone: \_\_\_\_\_  
Assigned inspector: \_\_\_\_\_ Contact phone: \_\_\_\_\_

### **7.6.5      *Visual Monitoring Follow-Up and Reporting***

Correction of deficiencies identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed as soon as possible. If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be initiated within 72 hours of identification and be completed as soon as possible. When design changes to BMPs are required, the SWPPP shall be amended to reflect the changes. Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on the Construction Site Inspection Report Form and shall be retained in the SWPPP **Appendix H**. A copy will be included in CSMP Attachment 2 “Monitoring Records” in **Appendix L**.

## **7.7      *Water Quality Sampling and Analysis***

### **7.7.1      *Sampling and Analysis Plan for Non-Visible Pollutants in Storm Water Runoff Discharges***

This Sampling and Analysis Plan for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in storm water runoff discharges from the project site. This SWPPP was designed to meet the requirements of **Risk Level 1**. Sampling will need to be performed if visual monitoring indicates that there has been a breach, leakage, malfunction, or spill from a BMP which could result in the discharge of storm water pollutants that will not be visually detectable, or if storm water comes into contact with soil amendments or other exposed materials or contaminants and is allowed to be discharged. The construction materials, wastes, or activities, as identified in Section 2.6, are potential sources of non-visible pollutants to storm water discharges from the project. The sampling and analysis parameters and procedures are designed to determine whether the BMPs installed and maintained prevent discharges of sediment from contributing to impairment in receiving waters. If sampling and

analysis is required per these situations, the following procedures will apply to sampling and analysis:

- Monitor for the applicable parameter;
- Samples will be collected during the first two hours of discharge from rain events;
- Samples will be collected during daylight hours (sunrise to sunset) and shall be collected regardless of the time of year and phase of construction;
- All samples will be taken at discharge locations;
- Field samples will be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed; and
- Portable meters will be calibrated according to manufacturer's specifications.

#### *7.7.1.1 Sampling Schedule*

Samples for the applicable non-visible pollutant(s) and a sufficiently large uncontaminated background sample will be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples shall be collected during the site's scheduled hours and shall be collected regardless of the time of year and phase of the construction Site.

Sampling and analysis is required when non –visible pollutants have the potential to contact storm water and runoff the construction Site into drainage system or water body at levels that may cause or contribute to exceedance of water quality standards. Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during site inspections conducted before or during a rain events:

- Materials or wastes containing potential non-visible pollutants are not stored under covered conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.
- An operational activity with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.
- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.
- Storm water runoff from an area contaminated by historical usage of the site has been observed to combine with storm water runoff from the site, and there is the potential for discharge of non-visible pollutants to surface waters or a storm sewer system.

The samples must be collected as described below and in accordance with the applicable sections of the American Public Health Associations "Standard Methods for the Examination of Water and Wastewater". Only trained personnel will be tasked with the sampling responsibilities. Manual sampling will be the primary method for collecting samples at the Site.

#### 7.7.1.2 *Sampling Locations*

Sampling locations are based on proximity to identified discharge or run-on location(s), accessibility for sampling, personnel safety, and other factors in accordance with applicable requirements. Sampling locations for non-visible pollutants will be determined in the field, if a breach of BMPs or spills or there is the potential for discharge of non-visible pollutants to surface waters or drainage system have occurred. Samples should be obtained upgradient of the discharge and down gradient of the discharge.

- An upgradient control sample can be analyzed for the prevailing condition of the receiving water without any influence from the construction Site. The control sample will be used to determine the background levels.
- A down gradient sample location should be obtained where direct discharge leaves the property of the project.

#### 7.7.1.3 *Monitoring Preparation*

Non-visible pollutant samples will be collected by:

|            |                                         |                                        |
|------------|-----------------------------------------|----------------------------------------|
| Contractor | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| Consultant | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| Laboratory | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, clean powder-free nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, and ice. A Sampling Field Log Sheet, and Chain of Custody forms are provided in CSMP Attachment 3 “Example Forms” in **Appendix L**.

#### 7.7.1.4 *Analytical Constituents*

The table below is a general guide that lists specific sources and types of potential non-visible pollutants that may be encountered on the project site. In addition, the water quality indicator constituents for that pollutant is identified. It is noted that not all general work activities or potential pollutants are part of this project. Field verification must be conducted to identify pollutants of concern.

**Table 7.2 - Potential Non-Visible Pollutants and Water Quality Indicator Constituents**

| Common Non-Visible Pollutants and Water Quality Indicator Constituents Worksheet |                                                                      |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------|
| General Work Activity/Potential Pollutants                                       | Water Quality Indicators of Potential Constituents                   |
| Adhesives                                                                        | COD, Phenols, SVOCs                                                  |
| Asphalt Work                                                                     | VOCs                                                                 |
| <b>Cleaning</b>                                                                  |                                                                      |
| Acids                                                                            | pH                                                                   |
| Bleaches                                                                         | Residual chlorine                                                    |
| TSP                                                                              | Phosphate                                                            |
| Solvents                                                                         | VOCs, SVOCs                                                          |
| Detergents                                                                       | MBAS                                                                 |
| <b>Concrete / Masonry Work</b>                                                   |                                                                      |
| Sealant (Methyl methacrylate)                                                    | SVOC                                                                 |
| Curing compounds                                                                 | VOCs, SVOCs, pH                                                      |
| Ash, slag, sand                                                                  | pH, Al, Ca, Va, Zn                                                   |
| <b>Grading / Earthworks</b>                                                      |                                                                      |
| Gypsum / Lime amendments                                                         | pH                                                                   |
| Contaminated Soil                                                                | Constituents specific to known contaminants, check with Laboratory   |
| <b>Landscaping</b>                                                               |                                                                      |
| Pesticides/Herbicides                                                            | Product dependent, see label and check with Laboratory               |
| Liquid Waste                                                                     | Constituents specific to materials, check with Laboratory            |
| <b>Planting / Vegetation Management</b>                                          |                                                                      |
| Vegetation stockpiles                                                            | BOD                                                                  |
| Fertilizers                                                                      | TKN, NO3, BOD, COD, DOC, sulfate, NH3,                               |
| Phosphate, Potassium                                                             | Phosphate, Potassium                                                 |
| <b>Plumbing</b>                                                                  |                                                                      |
| Solder, flux, pipe fitting                                                       | Cu, Pb, Sn, Zn                                                       |
| <b>Removal of existing structures</b>                                            |                                                                      |
|                                                                                  | Zn, VOCs, PCBs (verify activity categories, e.g., grading, painting) |
| <b>Sanitary Waste</b>                                                            |                                                                      |
| Portable Toilets (using blue fluid, visible)                                     | BOD, Total/Fecal coliform                                            |
| <b>Soil Preparation / Amendments/Dust Control</b>                                |                                                                      |
| Polymer/Co-polymers                                                              | TKN, NO3, BOD, COD, DOC, Sulfate, Ni                                 |
| Lignin sulfate                                                                   | TDS, alkalinity                                                      |
| Psyllium                                                                         | COD, TOC                                                             |
| Guar/Plant Gums                                                                  | COD, TOC, Ni                                                         |
| Solid Waste (leakage)                                                            | BOD                                                                  |
| Utility Line Testing and Flushing                                                | Residual chlorine, chloramines                                       |
| <b>Vehicle and Equipment Use</b>                                                 |                                                                      |
| Batteries                                                                        | Sulfuric acid; Pb, pH                                                |

#### 7.7.1.5 *Sample Collection*

Samples of discharge shall be collected at the designated non-visible pollutant sampling locations determined by observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event.

Grab samples shall be collected and preserved in accordance with the appropriate means and methods. Only the QSP, or personnel trained in water quality sampling under the direction of the QSP shall collect samples.

#### 7.7.1.6 *Designated Laboratory*

Samples shall be analyzed by the designated laboratory using the analytical methods identified in the following page (Table 7.3). The laboratory contact information is provided below.

Laboratory Name: \_\_\_\_\_  
Street Address: \_\_\_\_\_  
City, State Zip: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_  
Point of Contact: \_\_\_\_\_  
ELAP Certification  
Number: \_\_\_\_\_

Samples will be delivered to the laboratory by:

|                                 |                              |                             |
|---------------------------------|------------------------------|-----------------------------|
| Driven by Contractor            | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Picked up by Laboratory Courier | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Shipped                         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**Table 7.3 - Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants**

| Constituent                             | Analytical Method                              | Minimum Sample Volume | Sample Containers | Sample Preservation           | Reporting Limit | Maximum Holding Time |
|-----------------------------------------|------------------------------------------------|-----------------------|-------------------|-------------------------------|-----------------|----------------------|
| PCBs                                    | EPA 8081A/8082                                 | 1x1 L                 | Glass-Amber       | Store at 4°C                  | 0.1 µg/L        | 7 days               |
| BOD                                     | EPA 405.1/SM 5210 B                            | 1x500 mL              | Polypropylene     | Store at 4°C                  | 1 mg/L          | 48 hours             |
| COD                                     | EPA 410.4/ SM 5220 D                           | 1x250 mL              | Glass-Amber       | Store at 4°C, H2SO4 to pH<2   | 5 mg/L          | 28 days              |
| Metals (Al, Ca, Cu, Ni, Pb, Sn, Va, Zn) | EPA 6010B/ 7470A                               | 1x250 mL              | Polypropylene     | Store at 4°C, HNO3 to pH <2   | 0.1 mg/L        | 6 months             |
| pH                                      | Field test with calibrated portable instrument | 1x100 mL              | Polypropylene     | None                          | Unitless        | 15 minutes           |
| SVOCs                                   | EPA 8270C/ EPA 625                             | 1x1 L                 | Glass-Amber       | Store at 4°C                  | 10 µg/L         | 7 days               |
| TOC                                     | EPA 9060/ SM 5310 C                            | 1x250 mL              | Glass-Amber       | Store at 4°C, H2SO4 to pH < 2 | 2 mg/L          | 28 days              |
| VOCs-Solvents                           | EPA 8260B/ EPA 624                             | 3x40 mL               | VOA-Glass         | Store at 4°C, HCl to pH<2     | 50 µg/L         | 14 days              |
| Phenols, Total                          | EPA 420.1/ EPA 9065                            | 1x250 mL              | Glass-Amber       | Store at 4°C                  | 0.1 µg/L        | 28 days              |
| Chlorine, Residual                      | SM 4500 Cl-G                                   | 1x125 mL              | Glass             | Unpreserved                   | 0.1 mg/L        | 15 minutes           |
| <b>NOTES:</b>                           |                                                |                       |                   |                               |                 |                      |



#### 7.7.1.7 *Data Evaluation and Reporting*

An evaluation of the water quality sample analytical results will be performed by the QSP upon receiving analytical results from the laboratory. As determined by the Site conditions and data evaluation, appropriate BMPs shall be repaired or modified to mitigate discharges of potential pollutants. Revisions to the BMPs shall be recorded as an amendment to the SWPPP.

The CGP prohibits the storm water discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4. The results of any non-storm water discharge results that indicate the presence of a hazardous substance in excess of established reportable quantities shall be immediately reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4. Results of non-visible pollutant monitoring shall be reported in the Annual Report.

#### 7.7.2 *Sampling and Analysis Plan for pH and Turbidity in Storm Water Runoff Discharges*

Sampling and analysis of runoff for pH and turbidity is not required for **Risk Level 1** projects.

#### 7.7.3 *Sampling and Analysis Plan for pH, Turbidity, and SSC in Receiving Water*

This project is not subject to Receiving Water Monitoring.

#### 7.7.4 *Sampling and Analysis Plan for Non-Storm Water Discharges*

This project is not subject to the non-storm water sampling and analysis requirements of the General Permit because it is a Risk Level 1 project.

#### 7.7.5 *Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board*

The Regional Water Board has not specified monitoring for additional pollutants.

#### 7.7.6 *Training of Sampling Personnel*

Sampling personnel shall be trained to collect, maintain, and ship samples. Training records of designated contractor sampling personnel are provided in **Appendix I**.

The following storm water sampling personnel have received the following storm water sampling training and are qualified to obtain samples at the Site:

**Name:**

**Training:**

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### **7.7.7            *Sample Collection and Handling***

#### **7.7.7.1        *Sample Collection***

Samples shall be collected at the designated sampling locations shown on the Site Maps and listed in the preceding sections. Samples shall be collected, maintained and shipped in accordance with industry standards. Grab samples shall be collected and preserved in accordance with the methods identified in preceding sections. To maintain sample integrity and prevent cross-contamination, sample collection personnel shall follow the protocols below.

- Collect samples (for laboratory analysis) only in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sites;
- Decontaminate all equipment (e.g. bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water. (Dispose of wash and rinse water appropriately, i.e., do not discharge to storm drain or receiving water). Do not decontaminate laboratory provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;
- Do not park vehicles in the immediate sample collection area (even non-running vehicles);
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should never be dipped into the stream, but filled indirectly from the collection container.

#### **7.7.7.2        *Sample Documentation Procedures***

All original data documented on sample bottle identification labels, Sampling Field Log Sheet, and Chain of Custody forms shall be recorded using waterproof ink. If an error is made on a document, the individual shall make corrections by lining through the error and entering the correct information. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Sampling Field Log Sheet.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.

Field Log Sheets: Sampling personnel shall complete the Sampling Field Log Sheet and Receiving Water Sampling Field Log Sheet for each sampling event, as appropriate.

Chain of Custody: Sampling personnel shall complete the Chain of Custody for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the Chain of Custody when the sample(s) is turned over to the testing laboratory or courier.

## **7.8 Active Treatment System Monitoring**

This project does not require a project specific Sampling and Analysis Plan for an ATS because deployment of an ATS is not planned.

## **7.9 Bioassessment Monitoring**

This project is not subject to bioassessment monitoring because it is not a Risk Level 3 project.

## **7.10 Watershed Monitoring Option**

This project is not participating in a watershed monitoring option. Therefore, this section is not applicable.

## **7.11 Quality Assurance and Quality Control**

An evaluation of the water quality sample analytical results, including figures with sample locations, the water quality analytical results and the quality assurance/quality control (QA/QC) data will be performed by qualified personnel. Should the runoff sample show an increased level of the tested analyte relative to the background sample, the BMPs, Site conditions, and surrounding influences will be accessed to determine the probable cause for the increase.

### ***7.11.1 Field Logs***

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH and turbidity should also be recorded in the field log.

### ***7.11.2 Clean Sampling Techniques***

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 7.7.7, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

### ***7.11.3 Chain of Custody***

The sample Chain of Custody is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample Chain of Custody procedures include the following:

- Proper labeling of samples;
- Use of Chain of Custody forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

Analytical laboratories usually provide Chain of Custody forms to be filled out for sample containers.

#### **7.11.4 QA/QC Samples**

QA/QC samples provide an indication of the accuracy and precision of the sample collection; sample handling; field measurements; and analytical laboratory methods. The following types of QA/QC will be conducted for this project:

☒ Field Duplicates at a frequency of 1 per every 10 samples or 1 per sample event

☐ Equipment Blanks at a frequency of 1 per day or 1 per sample event

☐ Field Blanks at a frequency of 1 per day or 1 per sample event

##### **7.11.4.1 Field Duplicates**

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

##### **7.11.4.2 Equipment Blanks**

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment that has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters is used when sampling metals.

##### **7.11.4.3 Field Blanks**

Field blanks assess potential sample contamination levels that occur during field sampling activities. De-ionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

#### **7.11.5 Data Verification**

After results are received from the analytical laboratory, the QSP shall verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification shall include:

- Review the Chain of Custody and laboratory reports. Make sure all requested analyses were performed and all samples are accounted for in the reports.

- Review laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Review data for outlier values and follow up with the laboratory. Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP should especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location.
- Review laboratory QA/QC results. EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP shall evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.
- Review the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate. Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.

Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:

- Review field logs to make sure all required measurements were completed and appropriately documented;
- Review reported values that appear out of the typical range or inconsistent; Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and
- Review notations of any errors and actions taken to correct the equipment or recording errors.

## **7.12 Records Retention**

All records of storm water monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board.

Results of visual monitoring, field measurements, and laboratory analyses must be kept in the SWPPP along with Chain of Custody, and other documentation related to the monitoring.

Records are to be kept onsite while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation;
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements;

- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed the laboratory analyses;
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used;
- Rain gauge readings from site inspections;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records;
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections;

## Section 8                      References

---

California Stormwater Quality Association (CASQA), Stormwater BMP Handbook Portal: Construction, July 2012.

State Water Resources Control Board (2012). Order 2012-0006-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml).

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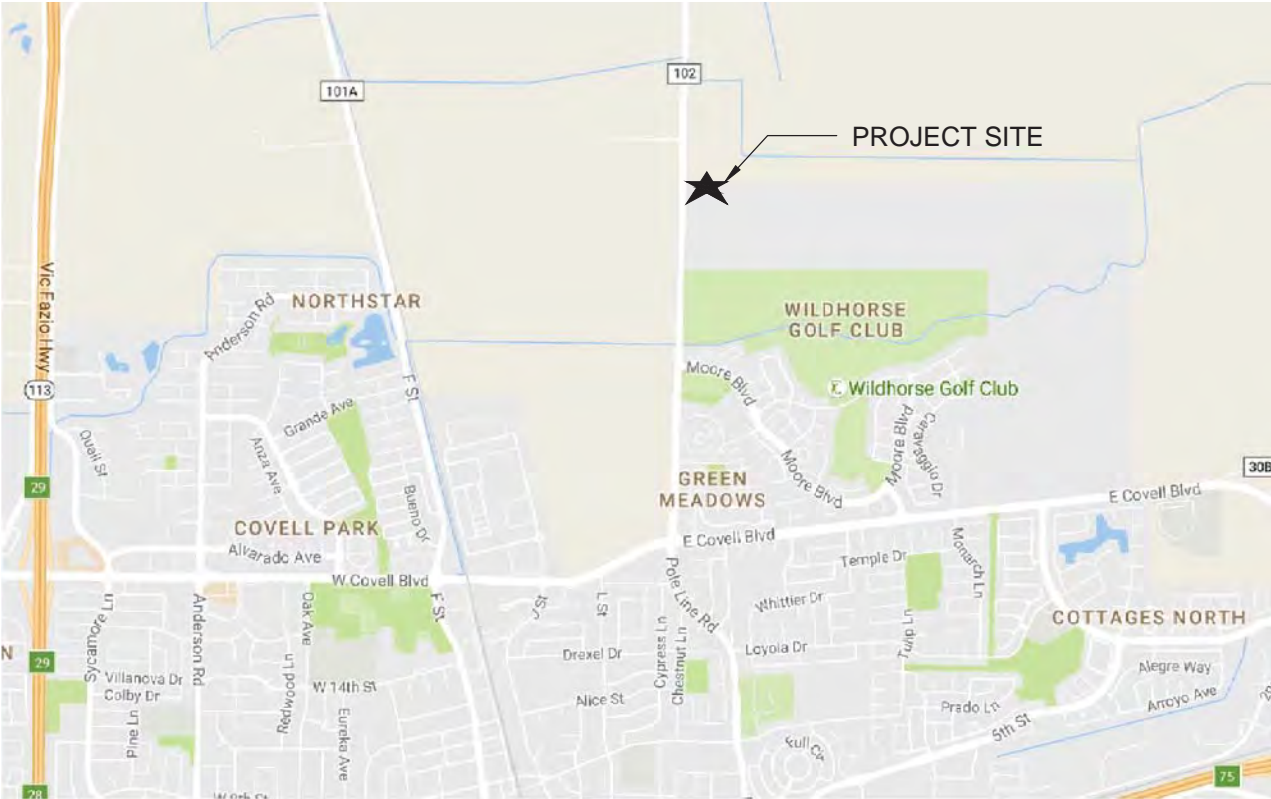
## **FIGURES**

**Figure 1 – SWPPP Site Location Map**

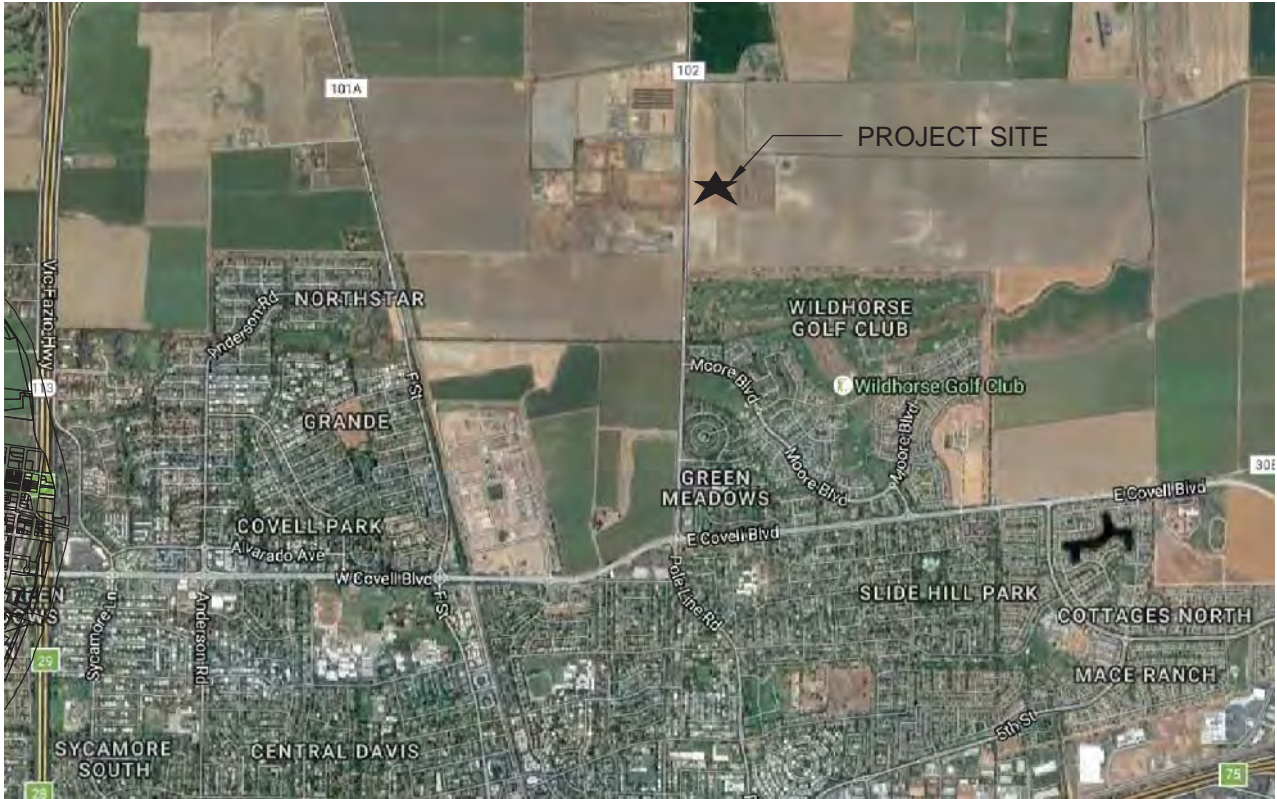
**Figure 2 – SWPPP BMP Map**

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STORM WATER POLLUTION PREVENTION PLAN  
LILLARD RANCH  
24998 COUNTRY ROAD 102, DAVIS, CALIFORNIA



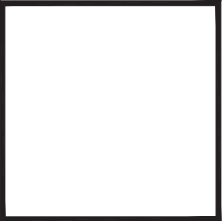
VICINITY MAP  
NOT TO SCALE




AERIAL MAP  
NOT TO SCALE

| REV | DATE | DESCRIPTION | BY | CHKD | APP. |
|-----|------|-------------|----|------|------|
|     |      |             |    |      |      |
|     |      |             |    |      |      |
|     |      |             |    |      |      |
|     |      |             |    |      |      |

|         |                                                                              |
|---------|------------------------------------------------------------------------------|
| TITLE   | SWPPP SITE LOCATION MAP                                                      |
| PROJECT | TRC PROJECT NO. 254981<br>LILLARD RANCH<br>24998 COUNTRY ROAD 102, DAVIS, CA |





Results you can rely on

JOB #: 254981  
BY: VL  
DATE: 03-07-2017

SHEET NO.

FIGURE 1

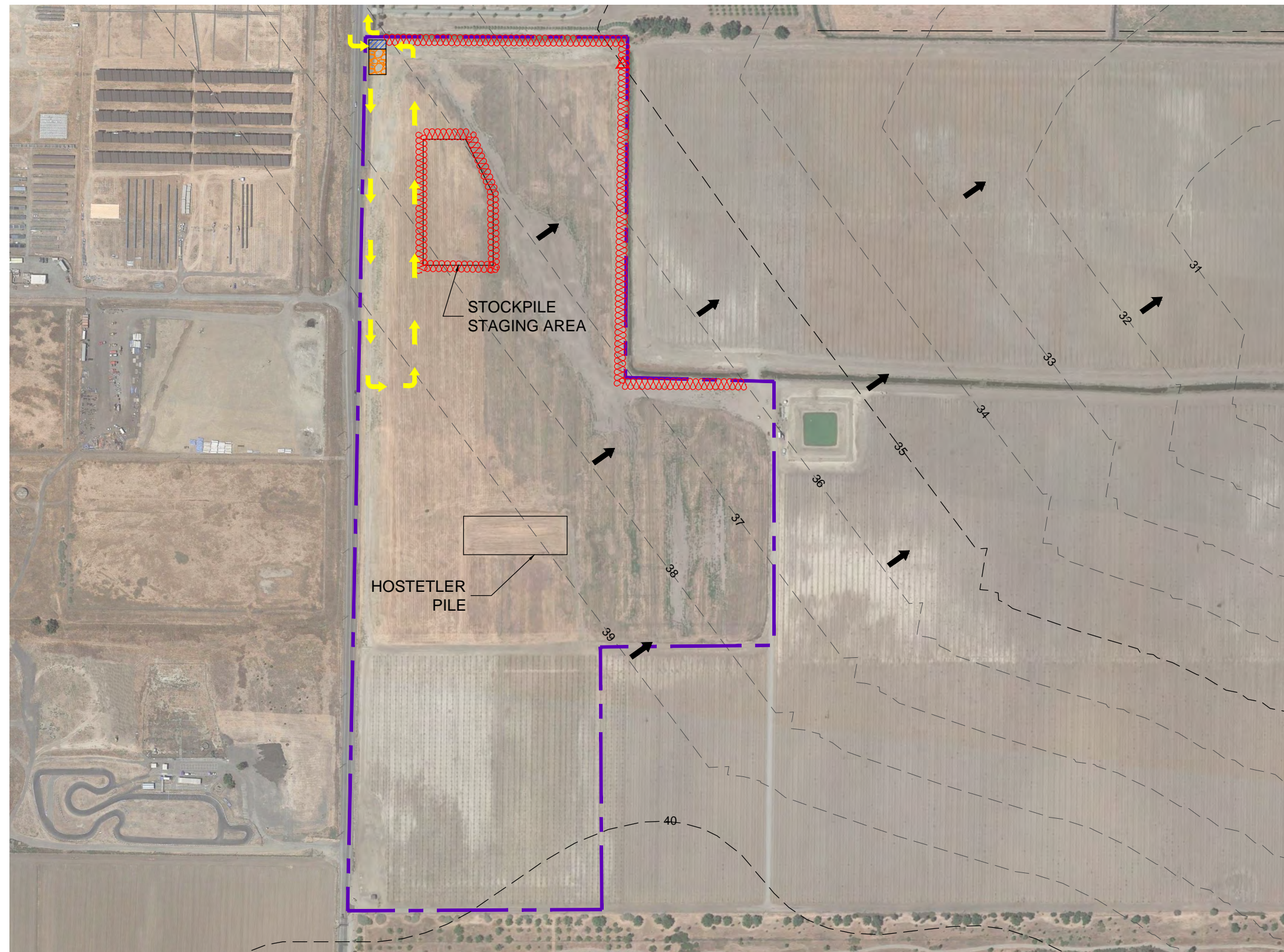
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# STORM WATER POLLUTION PREVENTION PLAN

## LILLARD RANCH

24998 COUNTY ROAD 102, DAVIS, CALIFORNIA



LEGEND:

- |                                                                                     |                                                    |
|-------------------------------------------------------------------------------------|----------------------------------------------------|
|  | RUMBLE PLATES (STABILIZED CONSTRUCTION ENTRANCE)   |
|  | GRAVEL ENTRANCE (STABILIZED CONSTRUCTION ENTRANCE) |
|  | FIBER ROLLS (WADDLES)                              |
|  | DISCHARGE LOCATION                                 |
|  | DRAINAGE ARROWS                                    |
|  | MAJOR CONTOURS                                     |
|  | MINOR CONTOURS                                     |
|  | SITE BOUNDARY                                      |
|  | ACCESS ROAD                                        |

[illegible]SWPPP BMP MAP  
TRC PROJECT NO. 254981

LILLARD RANCH  
24998 COUNTY ROAD 102, DAVIS, CA

TITLE

PROJECT



Results you can rely on

UOB #: 254981

BY: VL

DATE: 03-07-2017

FIGURE 2



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**APPENDIX A**  
**Construction General Permit**

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**Linda S. Adams**  
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**Arnold Schwarzenegger**  
Governor

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## I. BACKGROUND

### A. History

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that established storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 lowered the permitting threshold from five acres to one acre.

While federal regulations allow two permitting options for storm water discharges (Individual Permits and General Permits), the State Water Board has elected to adopt only one statewide General Permit at this time that will apply to most storm water discharges associated with construction activity.

On August 19, 1999, the State Water Board reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999 the State Water Board amended Order 99-08-DWQ to apply to sites as small as one acre.

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the administrative burden associated with permitting individual storm water discharges. To obtain coverage under this General Permit, dischargers shall electronically file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance related documents required by this General Permit and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Quality Control Boards (Regional Water Boards) may issue General Permits or Individual Permits containing more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers.

### B. Legal Challenges and Court Decisions

#### 1. Early Court Decisions

Shortly after the passage of the CWA, the USEPA promulgated regulations exempting most storm water discharges from the NPDES permit requirements. (See 40 C.F.R. § 125.4 (1975); see also *Natural Resources Defense Council v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1372 (*Costle*); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1163 (*Defenders of Wildlife*).) When environmental groups challenged this exemption in federal court, the District of Columbia Court of Appeals invalidated the regulation, holding that the USEPA “does not have authority to exempt categories of point sources from the permit requirements of [CWA] § 402.” (*Costle*, 568 F.2d at 1377.) The *Costle* court rejected the USEPA’s argument that effluent-based storm sewer regulation was administratively infeasible because of the variable nature of storm water pollution and the number of affected storm sewers throughout the country. (*Id.* at 1377-82.) Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the USEPA had the flexibility under the CWA to design regulations that would overcome these problems. (*Id.* at 1379-83.) In particular, the court pointed to general permits and permits based on requiring best management practices (BMPs).

During the next 15 years, the USEPA made numerous attempts to reconcile the statutory requirement of point source regulation with the practical problem of regulating possibly millions of diverse point source discharges of storm water. (See *Defenders of Wildlife*, 191 F.3d at 1163; see also Gallagher, Clean Water Act in Environmental Law Handbook (Sullivan, edit., 2003) p. 300 (Environmental Law Handbook); Eisen, *Toward a Sustainable Urbanism: Lessons from Federal Regulation of Urban Storm Water Runoff* (1995) 48 Wash. U.J. Urb. & Contemp. L.1, 40-41 [Regulation of Urban Storm Water Runoff].)

In 1987, Congress amended the CWA to require NPDES permits for storm water discharges. (See CWA § 402(p), 33 U.S.C. § 1342(p); *Defenders of Wildlife*, 191 F.3d at 1163; *Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1296.) In these amendments, enacted as part of the Water Quality Act of 1987, Congress distinguished between industrial and municipal storm water discharges. With respect to industrial storm water discharges, Congress provided that NPDES permits "shall meet all applicable provisions of this section and section 1311 [requiring the USEPA to establish effluent limitations under specific timetables]." (CWA § 402(p)(3)(A), 33 U.S.C. § 1342(p)(3)(A); see also *Defenders of Wildlife*, 191 F.3d at 1163-64.)

In 1990, USEPA adopted regulations specifying what activities were considered "industrial" and thus required discharges of storm water associated with those activities to obtain coverage under NPDES permits. (55 Fed. Reg. 47,990 (1990); 40 C.F.R. § 122.26(b)(14).) Construction activities, deemed a subset of the industrial activities category, must also be regulated by an NPDES permit. (40 C.F.R. § 122.26(b)(14)(x)). In 1999, USEPA issued regulations for "Phase II" of storm water regulation, which required most small construction sites (1-5 acres) to be regulated under the NPDES program. (64 Fed. Reg. 68,722; 40 C.F.R. § 122.26(b)(15)(i).)

## 2. Court Decisions on Public Participation

Two recent federal court opinions have vacated USEPA rules that denied meaningful public review of NPDES permit conditions. On January 14, 2003, the Ninth Circuit Court of Appeals held that certain aspects of USEPA's Phase II regulations governing MS4s were invalid primarily because the general permit did not contain express requirements for public participation. (*Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832.) Specifically, the court determined that applications for general permit coverage (including the Notice of Intent (NOI) and Storm Water Management Program (SWMP)) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. (*Id.* at 852-54.) Similarly, on February 28, 2005, the Second Circuit Court of Appeals held that the USEPA's confined animal feeding operation (CAFO) rule violated the CWA because it allowed dischargers to write their own nutrient management plans without public review. (*Waterkeeper Alliance v. USEPA* (2d Cir. 2005) 399 F.3d 486.) Although neither decision involved the issuance of construction storm water permits, the State Water Board's Office of Chief Counsel has recommended that the new General Permit address the courts' rulings where feasible<sup>1</sup>.

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<sup>1</sup> In *Texas Independent Producers and Royalty Owners Assn. v. USEPA* (7th Cir. 2005) 410 F.3d 964, the Seventh Circuit Court of Appeals held that the USEPA's construction general permit was not required to provide the public with the opportunity for a public hearing on the Notice of Intent or Storm Water Pollution Prevention Plan. The Seventh Circuit briefly discussed why it agreed with the Ninth Circuit's dissent in *Environmental Defense Center*, but

The CWA and the USEPA's regulations provide states with the discretion to formulate permit terms, including specifying best management practices (BMPs), to achieve strict compliance with federal technology-based and water quality-based standards. (*Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) Accordingly, this General Permit has developed specific BMPs as well as numeric action levels (NALs) in order to achieve these minimum federal standards. In addition, the General Permit requires a SWPPP and REAP (another dynamic, site-specific plan) to be developed but has removed all language requiring the discharger to implement these plans – instead, the discharger is required to comply with specific requirements. By requiring the dischargers to implement these specific BMPs and NALs, this General Permit ensures that the dischargers do not “write their own permits.” As a result this General Permit does not require each discharger's SWPPP and REAP to be reviewed and approved by the Regional Water Boards.

This General Permit also requires dischargers to electronically file all permit-related compliance documents. These documents include, but are not limited to, NOIs, SWPPPs, annual reports, Notice of Terminations (NOTs), and numeric action level (NAL) exceedance reports. Electronically submitted compliance information is immediately available to the public, as well as the Regional Water Quality Control Board (Regional Water Board) offices, via the Internet. In addition, this General Permit enables public review and hearings on permit applications when appropriate. Under this General Permit, the public clearly has a meaningful opportunity to participate in the permitting process.

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generally did not discuss the substantive holdings in *Environmental Defense Center* and *Waterkeeper Alliance*, because neither court addressed the initial question of whether the plaintiffs had standing to challenge the permits at issue. However, notwithstanding the Seventh Circuit's decision, it is not binding or controlling on the State Water Board because California is located within the Ninth Circuit.

## **C. Blue Ribbon Panel of Experts and Feasibility of Numeric Effluent Limitations**

In 2005 and 2006, the State Water Board convened an expert panel (panel) to address the feasibility of numeric effluent limitations (NELs) in California's storm water permits. Specifically, the panel was asked to address:

"Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"

"The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

The ability of the State Water Board to establish appropriate objective limitations or criteria;

How compliance determinations would be made;

The ability of dischargers and inspectors to monitor for compliance; and

The technical and financial ability of dischargers to comply with the limitations or criteria."

Through a series of public participation processes (State Water Board meetings, State Water Board workshops, and the solicitation of written comments), a number of water quality, public process and overall program effectiveness problems were identified. Some of these problems are addressed through this General Permit.

## **D. Summary of Panel Findings on Construction Activities**

The panel's final report can be downloaded and viewed through links at [www.waterboards.ca.gov](http://www.waterboards.ca.gov) or by clicking [here](#)<sup>2</sup>.

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge."

"Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes."

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<sup>2</sup> [http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel\\_final\\_report.pdf](http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel_final_report.pdf)

“Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use.”

“To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites.”

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

“The quality of storm water discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography.”

“The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier.”

In addition, the panel made the following conclusions:

“It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with storm water discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible.”

“The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to storm water.”

“The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond.”

## **E. How the Panel’s Findings are Used in this General Permit**

The State Water Board carefully considered the findings of the panel and related public comments. The State Water Board also reviewed and considered the comments regarding statewide storm water policy and the reissuance of the Industrial General Permit. From the input received the State Water Board identified some permit and program performance gaps that are addressed in this General Permit. The Summary of Significant Changes (below) in this General Permit are a direct result of this process.

## **F. Summary of Significant Changes in This General Permit**

The State Water Board has significant changes to Order 99-08-DWQ. This General Permit differs from Order 99-08-DWQ in the following significant ways:

**Rainfall Erosivity Waiver:** this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

**Technology-Based Numeric Action Levels:** this General Permit includes NALs for pH and turbidity.

**Risk-Based Permitting Approach:** this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.

**Minimum Requirements Specified:** this General Permit imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

**Project Site Soil Characteristics Monitoring and Reporting:** this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

**Effluent Monitoring and Reporting:** this General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to evaluate whether NALs and NELs for Active Treatment Systems included in this General Permit are exceeded.

**Receiving Water Monitoring and Reporting:** this General Permit requires some Risk Level 3 and LUP Type 3 dischargers to monitor receiving waters and conduct bioassessments.

**Post-Construction Storm Water Performance Standards:** this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize and/or mitigate post-construction storm water runoff impacts.

**Rain Event Action Plan:** this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

**Annual Reporting:** this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and public information.

**Certification/Training Requirements for Key Project Personnel:** this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

**Linear Underground/Overhead Projects:** this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).



## **II. RATIONALE**

### **A. General Permit Approach**

A general permit for construction activities is an appropriate permitting approach for the following reasons:

1. A general permit is an efficient method to establish the essential regulatory requirements for a broad range of construction activities under differing site conditions;
2. A general permit is the most efficient method to handle the large number of construction storm water permit applications;
3. The application process for coverage under a general permit is far less onerous than that for individual permit and hence more cost effective;
4. A general permit is consistent with USEPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the CWA in designing a workable and efficient permitting system; and
5. A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with water quality standards for discharges. In most cases, the general permit will provide sufficient and appropriate management requirements to protect the quality of receiving waters from discharges of storm water from construction sites.

There may be instances where a general permit is not appropriate for a specific construction project. A Regional Water Board may require any discharger otherwise covered under the General Permit to apply for and obtain an Individual Permit or apply for coverage under a more specific General Permit. The Regional Water Board must determine that this General Permit does not provide adequate assurance that water quality will be protected, or that there is a site-specific reason why an individual permit should be required.

### **B. Construction Activities Covered**

#### **1. Construction activity subject to this General Permit:**

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with LUPs including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete

and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.<sup>3</sup>

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction<sup>4</sup> (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

## **2. Linear Underground/Overhead Projects (LUPs) subject to this General Permit:**

Underground/overhead facilities typically constructed as LUPs include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Water Quality Order 2003-0007-DWQ regulated construction activities associated with small LUPs that resulted in land disturbances greater than one acre, but less than five acres. These projects were considered non-traditional construction projects. Attachment A of this Order now regulates all construction activities from LUPs resulting in land disturbances greater than one acre.

## **3. Common Plan of Development or Sale**

USEPA regulations include the term “common plan of development or sale” to ensure that acreage within a common project does not artificially escape the permit requirements because construction activities are phased, split among smaller parcels, or completed by different owners/developers. In the absence of an

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<sup>3</sup> Pursuant to the Ninth Circuit Court of Appeals’ decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the USEPA’s petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

<sup>4</sup> A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the Regional Water Board or State Water Board.

exact definition of “common plan of development or sale,” the State Water Board is required to exercise its regulatory discretion in providing a common sense interpretation of the term as it applies to construction projects and permit coverage. An overbroad interpretation of the term would render meaningless the clear “one acre” federal permitting threshold and would potentially trigger permitting of almost any construction activity that occurs within an area that had previously received area-wide utility or road improvements.

Construction projects generally receive grading and/or building permits (Local Permits) from local authorities prior to initiating construction activity. These Local Permits spell out the scope of the project, the parcels involved, the type of construction approved, etc. Referring to the Local Permit helps define “common plan of development or sale.” In cases such as tract home development, a Local Permit will include all phases of the construction project including rough grading, utility and road installation, and vertical construction. All construction activities approved in the Local Permit are part of the common plan and must remain under the General Permit until construction is completed. For custom home construction, Local Permits typically only approve vertical construction as the rough grading, utilities, and road improvements were already independently completed under the a previous Local Permit. In the case of a custom home site, the homeowner must submit plans and obtain a distinct and separate Local Permit from the local authority in order to proceed. It is not the intent of the State Water Board to require permitting for an individual homeowner building a custom home on a private lot of less than one acre if it is subject to a separate Local Permit. Similarly, the installation of a swimming pool, deck, or landscaping that disturbs less than one acre that was not part of any previous Local Permit are not required to be permitted.

The following are several examples of construction activity of less than one acre that would require permit coverage:

- a. A landowner receives a building permit(s) to build tract homes on a 100-acre site split into 200 one-third acre parcels, (the remaining acreage consists of streets and parkways) which are sold to individual homeowners as they are completed. The landowner completes and sells all the parcels except for two. Although the remaining two parcels combined are less than one acre, the landowner must continue permit coverage for the two parcels.
- b. One of the parcels discussed above is sold to another owner who intends to complete the construction as already approved in the Local Permit. The new landowner must file Permit Registration Documents (PRDs) to complete the construction even if the new landowner is required to obtain a separate Local Permit.
- c. Landowner in (1) above purchases 50 additional one half-acre parcels adjacent to the original 200-acre project. The landowner seeks a Local Permit (or amendment to existing Local permit) to build on 20 parcels while leaving the remaining 30 parcels for future development. The landowner must amend PRDs to include the 20 parcels 14 days prior to commencement of construction activity on those parcels.

## **C. Construction Activities Not Covered**

### **1. Traditional Construction Projects Not Covered**

This General Permit does not apply to the following construction activity:

- a. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

- b. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.
- c. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.
- d. Discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction projects in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit. Construction projects within the Lahontan region must also comply with the Lahontan Region Project Guideline for Erosion Control (R6T-2005-0007 Section), which can be found at [http://www.waterboards.ca.gov/lahontan/Adopted\\_Orders/2005/r6t\\_2005\\_0007.pdf](http://www.waterboards.ca.gov/lahontan/Adopted_Orders/2005/r6t_2005_0007.pdf)
- e. Construction activity that disturbs less than one acre of land surface, unless part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
- f. Construction activity covered by an individual NPDES Permit for storm water discharges.
- g. Landfill construction activity that is subject to the Industrial General Permit.
- h. Construction activity that discharges to Combined Sewer Systems.
- i. Conveyances that discharge storm water runoff combined with municipal sewage.
- j. Discharges of storm water identified in CWA § 402(l)(2), 33 U.S.C. § 1342(l)(2).

## 2. Linear Projects Not Covered

- a. LUP construction activity does not include linear routine maintenance projects. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:
  - i. Maintain the original purpose of the facility or hydraulic capacity.
  - ii. Update existing lines<sup>5</sup> and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.
  - iii. Repairing leaks.

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<sup>5</sup>Update existing lines includes replacing existing lines with new materials or pipes.

Routine maintenance does not include construction of new<sup>6</sup> lines or facilities resulting from compliance with applicable codes, standards, and regulations.

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must secure new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

- b. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).
- c. Tie-ins conducted immediately adjacent to “energized” or “pressurized” facilities by the discharger are not considered construction activities where all other LUP construction activities associated with the tie-in are covered by an NOI and SWPPP of a third party or municipal agency.

### **3. EPA’s Small Construction Rainfall Erosivity Waiver**

EPA’s Storm Water Phase II Final Rule provides the option for a Small Construction Rainfall Erosivity Waiver. This waiver applies to small construction sites between 1 and 5 acres, and allows permitting authorities to waive those sites that do not have adverse water quality impacts.

Dischargers eligible for this waiver are exempt from Construction General Permit Coverage. In order to obtain the waiver, the discharger must certify to the State Water Board that small construction activity will occur only when the rainfall erosivity factor is less than 5 (“R” in the Revised Universal Soil Loss Equation). The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a practice that provides interim non-vegetative stabilization can be used for the end of the construction period. The operator must agree (as a condition waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the General Permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with a certification statement constitutes acceptance of and commitment to complete the final stabilization process. The discharger must submit a waiver certification to the State Board prior to commencing construction activities.

USEPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. Dischargers can access the calculator from EPA’s website at: [www.epa.gov/npdes/stormwater/cgp](http://www.epa.gov/npdes/stormwater/cgp). Use of the calculator allows the discharger to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage.

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<sup>6</sup>New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

## **D. Obtaining and Terminating Permit Coverage**

The appropriate Legally Responsible Person (LRP) must obtain coverage under this General Permit. To obtain coverage, the LRP or the LRP's Approved Signatory must file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

To obtain coverage under this General Permit, LRPs must electronically file the PRDs, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by this General Permit, and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Boards may issue General Permits or Individual Permits that contain more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers that obtain coverage under Individual Permits.

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

The application requirements of the General Permit establish a mechanism to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the General Permit's requirements.

This General Permit provides a grandfathering exception to existing dischargers subject to Water Quality Order No. 99-08-DWQ. Construction projects covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at Risk Level 1. LUP projects covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage at LUP Type 1. The Regional Water Boards have the authority to require Risk Determination to be performed on projects currently covered under Water Quality Order No. 99-08-DWQ and 2003-0007-DWQ where they deem necessary.

LRPs must file a Notice of Termination (NOT) with the Regional Water Board when construction is complete and final stabilization has been reached or ownership has been transferred. The discharger must certify that all State and local requirements have been met in accordance with this General Permit. In order for construction to be found complete, the discharger must install post-construction storm water management measures and establish a long-term maintenance plan. This requirement is intended to ensure that the post-construction conditions at the project site do not cause or contribute to direct or indirect water quality impacts (i.e., pollution and/or hydromodification) upstream and downstream. Specifically, the discharger must demonstrate compliance with the post-construction standards set forth in this General Permit (Section XIII). The discharger is responsible for all compliance issues including all annual fees until the NOT has been filed and approved by the local Regional Water Board.

## **E. Discharge Prohibitions**

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions set forth in the Order. This General Permit prohibits the discharge of pollutants other than storm water and non-storm water discharges authorized by this General Permit or another NPDES permit. This General Permit also prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the nine Regional Water Boards. Discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural BMPs. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction projects. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Therefore this General Permit authorizes such discharges provided they meet the following conditions.

These authorized non-storm water discharges must:

1. be infeasible to eliminate;
2. comply with BMPs as described in the SWPPP;
3. filter or treat, using appropriate technology, all dewatering discharges from sedimentation basins;
4. meet the NALs for pH and turbidity; and
5. not cause or contribute to a violation of water quality standards.

Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges.

This General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

## **F. Effluent Standards for All Types of Discharges**

### **1. Technology-Based Effluent Limitations**

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) for toxic pollutants and non conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. Additionally, these provisions require controls of pollutant discharges to reduce pollutants and any more stringent controls necessary to meet water quality standards. The USEPA has already established such limitations, known as effluent limitation guidelines (ELGs), for some industrial categories. This is not the case with construction discharges. In instances where there are no ELGs the permit writer is to use best professional judgment (BPJ) to establish requirements that the discharger must meet using BAT/BCT technology. This General Permit contains only narrative effluent limitations and does not contain numeric effluent limitations, except for Active Treatment Systems (ATS).

Order No. 2009-0009-DWQ, as originally adopted by the State Water Board on September 2, 2009, contained numeric effluent limitations for pH (within the range of 6.0 and 9.0 pH units) and turbidity (500 NTU) that applied only to Risk Level 3 and LUP Type 3 construction sites. The State Water Board adopted the numeric effluent limitations as technology-based effluent limitations based upon its best professional judgment. The California Building Industry Association, the Building Industry Legal Defense

Foundation, and the California Business Properties Association (petitioners) challenged Order No. 2009-0009-DWQ in *California Building Industry Association et al. v. State Water Resources Control Board*. On December 27, 2011, the Superior Court issued a judgment and writ of mandamus. The Superior Court ruled in favor of the State Water Board on almost all of the issues the petitioners raised, but the Superior Court invalidated the numeric effluent limitations for pH and turbidity for Risk Level 3 and LUP Type 3 sites because it determined that the State Water Board did not have sufficient BMP performance data to support those numeric effluent limitations. Therefore, the Superior Court concluded that the State Water Board did not comply with the federal regulations that apply to the use of best professional judgment. In invalidating the numeric effluent limitations, the Superior Court also suspended two ancillary requirements (a compliance storm event provision and receiving water monitoring at Risk Level 3 and LUP Type 3 sites that violated the numeric effluent limitations) that related solely to the invalidated numeric effluent limitations.

As a result of the Superior Court's writ of mandamus, this Order no longer contains numeric effluent limitations for pH and turbidity, except for ATS. In addition, as a result of the Superior Court's writ of mandamus, the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 sites were suspended until the State Water Board amended this Order to restore the receiving water monitoring requirements. As amended, this Order now requires Risk Level 3 and LUP Type 3 Dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers. The receiving water monitoring triggers were established at the same levels as the previous numeric effluent limitations (effluent pH outside the range of 6.0 and 9.0 pH units or turbidity exceeding 500 NTU). In restoring the receiving water monitoring requirements, the State Water Board determined that it was appropriate to require receiving water monitoring for these types of sites with direct discharges to surface waters that exceeded the receiving water monitoring triggers under any storm event scenarios, because these sites represent the highest threat to receiving water quality. An exceedance of a receiving water monitoring trigger does not constitute a violation of this General Permit. These receiving water monitoring requirements take effect on the effective date of the amendment to this Order.

BAT/BCT technologies not only include passive systems such as conventional runoff and sediment control, but also treatment systems such as coagulation/flocculation using sand filtration, when appropriate. Such technologies allow for effective treatment of soil particles less 0.02 mm (medium silt) in diameter. The discharger must install structural controls, as necessary, such as erosion and sediment controls that meet BAT and BCT to achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Because the permit is an NPDES permit, there is no legal requirement to address the factors set forth in Water Code sections 13241 and 13263, unless the permit is more stringent than what federal law requires. (See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 627.) None of the requirements in this permit are more stringent than the minimum federal requirements, which include technology-based requirements achieving BAT/BCT and strict compliance with water quality standards. The inclusion of numeric effluent limitations (NELs) in the permit for Active Treatment Systems does not cause the permit to be more stringent than current federal law. NELs and best management practices are simply two different methods of achieving the same federal requirement: strict compliance with state water quality standards. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The use of NELs to achieve compliance with water quality standards is not a more stringent requirement than the use of BMPs. (State Water Board Order No. WQ 2006-0012 (*Boeing*).) Accordingly, the State Water Board does not need to take into account the factors in Water Code sections 13241 and 13263.

The State Water Board has concluded that the establishment of BAT/BCT will not create or aggravate other environmental problems through increases in air pollution, solid waste generation, or energy consumption.—While there may be a slight increase in non-water quality impacts due to the implementation of additional monitoring or the construction of additional BMPs, these impacts will be negligible in comparison with the construction activities taking place on site and would be justified by the water quality benefits associated with compliance.



## **pH Receiving Water Monitoring Trigger**

Given the potential contaminants, the minimum standard method for control of pH in runoff requires the use of preventive measures such as avoiding concrete pours during rainy weather, covering concrete and directing flow away from fresh concrete if a pour occurs during rain, covering scrap drywall and stucco materials when stored outside and potentially exposed to rain, and other housekeeping measures. If necessary, pH-impaired storm water from construction sites can be treated in a filter or settling pond or basin, with additional natural or chemical treatment required to meet pH limits set forth in this permit. The basin or pond acts as a collection point and holds storm water for a sufficient period for the contaminants to be settled out, either naturally or artificially, and allows any additional treatment to take place. The State Water Board considers these techniques to be equivalent to BCT. In determining the pH concentration trigger for discharges, the State Water Board used BPJ to set these limitations.

The chosen trigger was established by calculating three standard deviations above and below the mean pH of runoff from highway construction sites<sup>7</sup> in California. Proper implementation of BMPs should result in discharges that are within the range of 6.0 to 9.0 pH Units.

## **Turbidity Receiving Water Monitoring Trigger**

The Turbidity receiving water monitoring trigger of 500 NTU is a technology-based trigger and was developed using three different analyses aimed at finding the appropriate threshold to set the technology-based limit to ensure environmental protection, effluent quality and cost-effectiveness. The analyses fell into three, main types: (1) an ecoregion-specific dataset developed by Simon et. al. (2004)<sup>8</sup>; (2) Statewide Regional Water Quality Control Board enforcement data; and (3) published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites.

A 1:3 relationship between turbidity (expressed as NTU) and suspended sediment concentration (expressed as mg/L) is assumed based on a review of suspended sediment and turbidity data from three gages used in the USGS National Water Quality Assessment Program:

USGS 11074000 SANTA ANA R BL PRADO DAM CA  
USGS 11447650 SACRAMENTO R A FREEPORT CA  
USGS 11303500 SAN JOAQUIN R NR VERNALIS CA

The receiving water monitoring trigger represents staff determination that the trigger value is the most practicable based on available data. The turbidity receiving water monitoring trigger represents a bridge between the narrative effluent limitations and receiving water limitations. To support this receiving water monitoring trigger, State Water Board staff analyzed construction site discharge information (monitoring data, estimates) and receiving water monitoring information.

Since the turbidity receiving water monitoring trigger represents an appropriate threshold level expected at a site, compliance with this value does not necessarily represent compliance with either the narrative effluent limitations (as enforced through the BAT/BCT standard) or the receiving water limitations. In the San Diego region, some inland surface waters have a receiving water objective for turbidity equal to 20 NTU. Obviously a discharge up to, but not exceeding, the turbidity receiving water monitoring trigger of

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<sup>7</sup> Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf>.

500 NTU may still cause or contribute to the exceedance of the 20 NTU standard. Most of the waters of the State are protected by turbidity objectives based on background conditions.

Table 1 - Regional Water Board Basin Plans, Water Quality Objectives for Turbidity

| REGIONAL WATER BOARD | WQ Objective                                                         | Background/Natural Turbidity                  | Maximum Increase              |
|----------------------|----------------------------------------------------------------------|-----------------------------------------------|-------------------------------|
| 1                    | Based on background                                                  | All levels                                    | 20%                           |
| 2                    | Based on background                                                  | > 50 NTU                                      | 10%                           |
| 3                    | Based on background                                                  | 0-50 JTU<br>50-100 JTU<br>> 100 JTU           | 20%<br>10 NTU<br>10%          |
| 4                    | Based on background                                                  | 0-50 NTU<br>> 50 NTU                          | 20%<br>10%                    |
| 5                    | Based on background                                                  | 0-5 NTU<br>5-50 NTU<br>50-100 NTU<br>>100 NTU | 1 NTU<br>20%<br>10 NTU<br>10% |
| 6                    | Based on background                                                  | All levels                                    | 10%                           |
| 7                    | Based on background                                                  | N/A                                           | N/A                           |
| 8                    | Based on background                                                  | 0-50 NTU<br>50-100 NTU<br>>100 NTU            | 20%<br>10 NTU<br>10%          |
| 9                    | Inland Surface Waters, 20 NTU<br><br>All others, based on background | <br><br>0-50 NTU<br>50-100 NTU<br>>100 NTU    | <br><br>20%<br>10 NTU<br>10%  |

Table 2 shows the suspended sediment concentrations at the 1.5 year flow recurrence interval for the 12 ecoregions in California from Simon et. al (2004).

Table 2 - Results of Ecoregion Analysis

| Ecoregion             | Percent of California Land Area | Median Suspended Sediment Concentration (mg/L) |
|-----------------------|---------------------------------|------------------------------------------------|
| 1                     | 9.1                             | 874                                            |
| 4                     | 0.2                             | 120                                            |
| 5                     | 8.8                             | 35.6                                           |
| 6                     | 20.7                            | 1530                                           |
| 7                     | 7.7                             | 122                                            |
| 8                     | 3.0                             | 47.4                                           |
| 9                     | 9.4                             | 284                                            |
| 13                    | 5.2                             | 143                                            |
| 14                    | 21.7                            | 5150                                           |
| 78                    | 8.1                             | 581                                            |
| 80                    | 2.4                             | 199                                            |
| 81                    | 3.7                             | 503                                            |
| Area-weighted average |                                 | 1633                                           |

If a 1:3 relationship between turbidity and suspended sediment is assumed, the median turbidity is 544 NTU.

The following table is composed of turbidity readings measured in NTUs from administrative civil liability (ACL) actions for construction sites from 2003 - 2009. This data was derived from the complete listing of construction-related ACLs for the six year period. All ACLs were reviewed and those that included turbidimeter readings at the point of storm water discharge were selected for this dataset.

Table 3 – ACL Sampling Data taken by Regional Water Board Staff

| WDID#       | Region | Discharger                                                  | Turbidity (NTU) |
|-------------|--------|-------------------------------------------------------------|-----------------|
| 5S34C331884 | 5S     | Bradshaw Interceptor Section 6B                             | 1800            |
| 5S05C325110 | 5S     | Bridalwood Subdivision                                      | 1670            |
| 5S48C336297 | 5S     | Cheyenne at Browns Valley                                   | 1629            |
| 5R32C314271 | 5R     | Grizzly Ranch Construction                                  | 1400            |
| 6A090406008 | 6T     | El Dorado County Department of Transportation, Angora Creek | 97.4            |
| 5S03C346861 | 5S     | TML Development, LLC                                        | 1600            |
| 6A31C325917 | 6T     | Northstar Village                                           | See Subdata Set |

Subdata Set - Turbidity for point of storm water runoff discharge at Northstar Village

| Date       | Turbidity (NTU) | Location                     |
|------------|-----------------|------------------------------|
| 10/5/2006  | 900             | Middle Martis Creek          |
| 11/2/2006  | 190             | Middle Martis Creek          |
| 01/04/2007 | 36              | West Fork, West Martis Creek |
| 02/08/2007 | 180             | Middle Martis Creek          |
| 02/09/2007 | 130             | Middle Martis Creek          |
| 02/09/2007 | 290             | Middle Martis Creek          |
| 02/09/2007 | 100             | West Fork, West Martis Creek |
| 02/10/2007 | 28              | Middle Martis Creek          |
| 02/10/2007 | 23              | Middle Martis Creek          |
| 02/10/2007 | 32              | Middle Martis Creek          |
| 02/10/2007 | 12              | Middle Martis Creek          |
| 02/10/2007 | 60              | West Fork, West Martis Creek |
| 02/10/2007 | 34              | West Fork, West Martis Creek |

A 95% confidence interval for mean turbidity in an ACL order was constructed. The data set used was a small sample size, so the 500 NTU (the value derived as the receiving water monitoring trigger for this General Permit) needed to be verified as a possible population mean. In this case, the population refers to a hypothetical population of turbidity measurements of which our sample of 20 represents. A t-distribution was assumed due to the small sample size:



TMDL should include a specific waste load allocation for this activity/source. The discharger, in this case, may be required by a separate Regional Water Board order to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. If a specific waste load allocation has been established that would apply to a specific discharge, the Regional Water Board may adopt an order requiring specific implementation actions necessary to meet that allocation. In the instance where an approved TMDL has specified a general waste load allocation to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, dischargers must consult with the state TMDL authority<sup>9</sup> to confirm that adherence to a SWPPP that meets the requirements of the General Permit will be consistent with the approved TMDL.

## **2. Determining Compliance with Effluent Standards**

### **a. Technology-Based Numeric Action Levels (NALs)**

This General Permit contains technology-based NALs for pH and turbidity, and requirements for effluent monitoring at all Risk level 2 & 3, and LUP Type 2 & 3 sites. Numeric action levels are essentially numeric benchmark values for certain parameters that, if exceeded in effluent sampling, trigger the discharger to take actions. Exceedance of an NAL does not itself constitute a violation of the General Permit. If the discharger fails to take the corrective action required by the General Permit, though, that may constitute a violation.

The primary purpose of NALs is to assist dischargers in evaluating the effectiveness of their on-site measures. Construction sites need to employ many different systems that must work together to achieve compliance with the permit's requirements. The NALs chosen should indicate whether the systems are working as intended.

Another purpose of NALs is to provide information regarding construction activities and water quality impacts. This data will provide the State and Regional Water Boards and the rest of the storm water community with more information about levels and types of pollutants present in runoff and how effective the dischargers BMPs are at reducing pollutants in effluent. The State Water Board also hopes to learn more about the linkage between effluent and receiving water quality. In addition, these requirements will provide information on the mechanics needed to establish compliance monitoring programs at construction sites in future permit deliberations.

#### **i. pH**

The chosen limits were established by calculating one standard deviation above and below the mean pH of runoff from highway construction sites<sup>10</sup> in California. Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units.

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<sup>9</sup> <http://www.waterboards.ca.gov/tmdl/tmdl.html>.

<sup>10</sup> Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: <http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf>.

The Caltrans study included 33 highway construction sites throughout California over a period of four years, which included 120 storm events. All of these sites had BMPs in place that would be generally implemented at all types of construction sites in California.

## **ii. *Turbidity***

BPJ was used to develop an NAL that can be used as a learning tool to help dischargers improve their site controls, and to provide meaningful information on the effectiveness of storm water controls. A statewide turbidity NAL has been set at 250 NTU.

## **G. Receiving Water Limitations**

Construction-related activities that cause or contribute to an exceedance of water quality standards must be addressed. The dynamic nature of construction activity gives the discharger the ability to quickly identify and monitor the source of the exceedances. This is because when storm water mobilizes sediment, it provides visual cues as to where corrective actions should take place and how effective they are once implemented.

This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards. The monitoring requirements in this General Permit for sampling and analysis procedures will help determine whether BMPs installed and maintained are preventing pollutants in discharges from the construction site that may cause or contribute to an exceedance of water quality standards.

Water quality standards consist of designated beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. When adopted by the State Water Board or a Regional Water Board, the ambient criteria are termed “water quality objectives.” If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to an exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff.)

In California, water quality standards are published in the Basin Plans adopted by each Regional Water Board, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan.

Dischargers can determine the applicable water quality standards by contacting Regional Water Board staff or by consulting one of the following sources. The actual Basin Plans that contain the water quality standards can be viewed at the website of the appropriate Regional Water Board.

(<http://www.waterboards.ca.gov/regions.html>), the State Water Board site for statewide plans (<http://www.waterboards.ca.gov/plnspols/index.html>), or the USEPA regulations for the NTR and CTR (40 C.F.R. §§ 131.36-38). Basin Plans and statewide plans are also available by mail from the appropriate Regional Water Board or the State Water Board. The USEPA regulations are available at <http://www.epa.gov/>. Additional information concerning water quality standards can be accessed through [http://www.waterboards.ca.gov/stormwtr/gen\\_const.html](http://www.waterboards.ca.gov/stormwtr/gen_const.html).

## **H. Training Qualifications and Requirements**

The Blue Ribbon Panel (BRP) made the following observation about the lack of industry-specific training requirements:

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

Order 99-08-DWQ required that all dischargers train their employees on how to comply with the permit, but it did not specify a curriculum or certification program. This has resulted in inconsistent implementation by all affected parties - the dischargers, the local governments where the construction activity occurs, and the regulators required to enforce 99-08-DWQ. This General Permit requires Qualified SWPPP Developers and practitioners to obtain appropriate training, and makes this curriculum mandatory two years after adoption, to allow time for course completion. The State and Regional Water Board are working with many stakeholders to develop the curriculum and mechanisms needed to develop and deliver the courses.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, the Qualified SWPPP Developer and Qualified SWPPP Practitioners responsible for creating, revising, overseeing, and implementing the SWPPP must attend a State Water Board-sponsored or approved Qualified SWPPP Developer and Qualified SWPPP Practitioner training course.

## I. Sampling, Monitoring, Reporting and Record Keeping

### 1. Traditional Construction Monitoring Requirements

This General Permit requires visual monitoring at all sites, and effluent water quality at all Risk Level 2 & 3 sites. It requires receiving water monitoring at some Risk Level 3 sites. All sites are required to submit annual reports, which contain various types of information, depending on the site characteristics and events. A summary of the monitoring and reporting requirements is found in Table 4.

**Table 4 - Required Monitoring Elements for Risk Levels**

|              | Visual                                                                            | Non-visible Pollutant                     | Effluent         | Receiving Water                                                                                                     |
|--------------|-----------------------------------------------------------------------------------|-------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------|
| Risk Level 1 |                                                                                   |                                           | where applicable | not required                                                                                                        |
| Risk Level 2 |                                                                                   |                                           | pH, turbidity    | not required                                                                                                        |
| Risk Level 3 | three types required for all Risk Levels: non-storm water, pre-rain and post-rain | As needed for all Risk Levels (see below) | pH, turbidity    | (if Receiving Water Monitoring Trigger exceeded) pH, turbidity and SSC. Bioassessment for sites 30 acres or larger. |

#### a. Visual

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. For storm-related inspections, dischargers must visually observe storm water discharges at all discharge locations within two business days after a qualifying event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge. Dischargers must conduct a post-storm event inspection to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify any additional BMPs necessary and revise the SWPPP accordingly. Dischargers must maintain on-site records of all visual observations, personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

## **b. Non-Visible Pollutant Monitoring**

This General Permit requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in storm water. Monitoring for non-visible pollutants must be required at any construction site when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

Of significant concern for construction discharges are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, such as cement, flyash, and other recycled materials or by-products of combustion. The water quality standards that apply to these materials will depend on their composition. Some of the more common storm water pollutants from construction activity are not CTR pollutants. Examples of non-visible pollutants include glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with storm water. High pH values from cement and gypsum, high pH and SSC from wash waters, and chemical/fecal contamination from portable toilets, also are not CTR pollutants. Although some of these constituents do have numeric water quality objectives in individual Basin Plans, many do not and are subject only to narrative water quality standards (i.e. not causing toxicity). Dischargers are encouraged to discuss these issues with Regional Water Board staff and other storm water quality professionals.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore receiving waters sampling is not required. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site.

Preventing or eliminating the exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions and at a time when they are unlikely to be washed away. Other construction materials can be exposed when storage, waste disposal or the application of the material is done in a manner not protective of water quality. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed. In cases where construction materials may be exposed to storm water, but the storm water is contained and is not allowed to run off the site, sampling will only be required when inspections show that the containment failed or is breached, resulting in potential exposure or discharge to receiving waters.

The discharger must develop a list of potential pollutants based on a review of potential sources, which will include construction materials soil amendments, soil treatments, and historic contamination at the site. The discharger must review existing environmental and real estate documentation to determine the potential for pollutants that could be present on the construction site as a result of past land use activities.

Good sources of information on previously existing pollution and past land uses include:

- i. Environmental Assessments;
- ii. Initial Studies;
- iii. Phase 1 Assessments prepared for property transfers; and
- iv. Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act.

In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.



The potential pollutant list must include all non-visible pollutants that are known or should be known to occur on the construction site including, but not limited to, materials that:

- i. are being used in construction activities;
- ii. are stored on the construction site;
- iii. were spilled during construction operations and not cleaned up;
- iv. were stored (or used) in a manner that created the potential for a release of the materials during past land use activities;
- v. were spilled during previous land use activities and not cleaned up; or
- vi. were applied to the soil as part of past land use activities.

### C. Effluent Monitoring

Federal regulations<sup>11</sup> require effluent monitoring for discharges subject to NALs. Subsequently, all Risk Level 2 and 3 dischargers must perform sampling and analysis of effluent discharges to characterize discharges associated with construction activity from the entire area disturbed by the project. Dischargers must collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

**Table 5 - Storm Water Effluent Monitoring Requirements by Risk Level**

|              | Frequency                                                                                                                                                         | Effluent Monitoring<br>(Section E, below)                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Risk Level 1 | when applicable                                                                                                                                                   | non-visible pollutant parameters (if applicable)                    |
| Risk Level 2 | Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area. | pH, turbidity, and non-visible pollutant parameters (if applicable) |
| Risk Level 3 | Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area. | pH, turbidity, and non-visible pollutant parameters if applicable   |

Risk Level 1 dischargers must analyze samples for:

- i. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment C contained in the General Permit.

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<sup>11</sup> 40 C.F.R. § 122.44.

Risk Level 2 dischargers must analyze samples for:

- i. pH and turbidity;
- ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment D contained in the General Permit, and
- iii. any additional parameters for which monitoring is required by the Regional Water Board.

Risk Level 3 dischargers must analyze samples for:

- i. pH, turbidity;
- ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment E contained in the General Permit, and
- iii. any additional parameters for which monitoring is required by the Regional Water Board.

## **2. Linear Monitoring and Sampling Requirements**

Attachment A, establishes minimum monitoring and reporting requirements for all LUPs. It establishes different monitoring requirements depending on project complexity and risk to water quality. The monitoring requirements for Type 1 LUPs are less than Type 2 & 3 projects because Type 1 projects have a lower potential to impact water quality.

A discharger shall prepare a monitoring program prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

### **a. Type 1 LUP Monitoring Requirements**

A discharger must conduct daily visual inspections of Type 1 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be conducted in conjunction with other daily activities. Inspections will be conducted to ensure the BMPs are adequate, maintained, and in place at the end of the construction day. The discharger will revise the SWPPP, as appropriate, based on the results of the daily inspections. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures have been installed, and successful final vegetative cover or other stabilization criteria have been met).

A discharger shall implement the monitoring program for inspecting Type 1 LUPs. This program requires temporary and permanent stabilization BMPs after active construction is completed. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where re-vegetation is chosen until minimum vegetative coverage has been established. Photographs shall be taken during site inspections and submitted to the State Water Board.

### **b. Type 2 & 3 LUP Monitoring Requirements**

A discharger must conduct daily visual inspections of Type 2 & 3 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be in conjunction with other daily activities.

All dischargers of Type 2 & 3 LUPs are required to conduct inspections by qualified personnel of the construction site during normal working hours prior to all anticipated storm events and after actual storm events. During extended storm events, the discharger shall conduct inspections during normal working hours for each 24-hour period. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures installed, and successful vegetative cover or other stabilization criteria have been met).

The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) to determine whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

All dischargers shall develop and implement a monitoring program for inspecting Type 2 & 3 LUPs that require temporary and permanent stabilization BMPs after active construction is completed. Inspections will be conducted to ensure the BMPs are adequate and maintained. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where revegetation is chosen until minimum vegetative coverage has been established.

A log of inspections conducted before, during, and after the storm events must be maintained in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection. Photographs must be taken during site inspections and submitted to the State Water Board.

### **C. Sampling Requirements for all LUP Project Types**

LUPs are also subject to sampling and analysis requirements for visible pollutants (i.e., sedimentation/siltation, turbidity) and for non-visible pollutants.

Sampling for visible pollutants is required for Type 2 & 3 LUPs.

Non-visible pollutant monitoring is required for pollutants associated with construction sites and activities that (1) are not visually detectable in storm water discharges, and (2) are known or should be known to occur on the construction site, and (3) could cause or contribute to an exceedance of water quality objectives in the receiving waters. Sample collection for non-visible pollutants must only be required (1) during a storm event when pollutants associated with construction activities may be discharged with storm water runoff due to a spill, or in the event there was a breach, malfunction, failure, and/or leak of any BMP, and (2) when the discharger has failed to adequately clean the area of material and pollutants. Failure to implement appropriate BMPs will trigger the same sampling requirements as those required for a breach, malfunction and/or leak, or when the discharger has failed to implement appropriate BMPs prior to the next storm event.

Additional monitoring parameters may be required by the Regional Water Boards.

It is not anticipated that many LUPs will be required to collect samples for pollutants not visually detected in runoff due to the nature and character of the construction site and activities as previously described in this fact sheet. Most LUPs are constructed in urban areas with public access (e.g., existing roadways, road shoulders, parking areas, etc.). This raises a concern regarding the potential contribution of pollutants from vehicle use and/or from normal activities of the public (e.g., vehicle washing, landscape fertilization, pest spraying, etc.) in runoff from the project site. Since the dischargers are not the land owners of the project area and are not able to control the presence of these pollutants in the storm water that runs through their projects, it is not the intent of this General Permit to require dischargers to sample for these pollutants. This General Permit does not require the discharger to sample for these types of pollutants except where the discharger has brought materials onsite that contain these pollutants and when a condition (e.g., breach, failure, etc.) described above occurs.

### 3. Receiving Water Monitoring

In order to ensure that receiving water limitations are met, discharges subject to receiving water monitoring triggers (i.e., Risk Level 3 and LUP Type 3 sites) or numeric effluent limitations (i.e., Risk Level 3 and LUP Type 3 sites utilizing ATS with direct discharges into receiving waters) must also monitor the downstream receiving water(s) for turbidity, SSC, and pH (if applicable) when a receiving water monitoring trigger or NEL is exceeded.

#### a. Bioassessment Monitoring

This General Permit requires a bioassessment of receiving waters for dischargers of Risk Level 3 or LUP Type 3 construction projects equal to or larger than 30 acres with direct discharges into receiving waters. Benthic macroinvertebrate samples will be taken upstream and downstream of the site's discharge point in the receiving water. Bioassessments measure the quality of the stream by analyzing the aquatic life present. Higher levels of appropriate aquatic species tend to indicate a healthy stream; whereas low levels of organisms can indicate stream degradation. Active construction sites have the potential to discharge large amounts of sediment and pollutants into receiving waters. Requiring a bioassessment for large project sites, with the most potential to impact water quality, provides a snapshot of the health of the receiving water prior to initiation of construction activities. This snapshot can be used in comparison to the health of the receiving water after construction has commenced.

Each ecoregion (biologically and geographically related area) in the State has a specific yearly peak time where stream biota is in a stable and abundant state. This time of year is called an Index Period. The bioassessment requirements in this General Permit, requires benthic macroinvertebrate sampling within a sites index period. The State Water Board has developed a map designating index periods for the ecoregions in the State (see State Water Board Website).

This General Permit requires the bioassessment methods to be in accordance with the Surface Water Ambient Monitoring Program (SWAMP) in order to provide data consistency within the state as well as generate useable biological stream data.

**Table 6 - Receiving Water Monitoring Requirements**

|                           | Receiving Water Monitoring Parameters                                                                                                  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Risk Level 1 /LUP Type 1  | not required                                                                                                                           |
| Risk Level 2 / LUP Type 2 | not required                                                                                                                           |
| Risk Level 3 / LUP Type 3 | If Receiving Water Monitoring Trigger exceeded: pH (if applicable), turbidity, and SSC.<br>Bioassessment for sites 30 acres or larger. |

### 4. Reporting Requirements

#### a. NAL Exceedance Report

All Risk Level 3 and LUP Type 3 dischargers must electronically submit all storm event sampling results to the State And Regional Boards, via the electronic data system, no later than 10 days after the conclusion of the storm event.

#### b. Annual Report

All dischargers must prepare and electronically submit an annual report no later than September 1 of each year using the Storm water Multi-Application Reporting and Tracking System (SMARTS). The

Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year, and identification of any compliance activities or corrective actions that were not implemented.

## **5. Record Keeping**

According to 40 C.F.R. Parts 122.21(p) and 122.41(j), the discharger is required to retain paper or electronic copies of all records required by this General Permit for a period of at least three years from the date generated or the date submitted to the State Water Board or Regional Water Boards. A discharger must retain records for a period beyond three years as directed by Regional Water Board.

## **J. Risk Determination**

### **1. Traditional Projects**

#### **a. Overall Risk Determination**

There are two major requirements related to site planning and risk determination in this General Permit. The project's overall risk is broken up into two elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters).

Project Sediment Risk:

Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. The RUSLE equation is as follows:

$$A = (R)(K)(LS)(C)(P)$$

Where: A = the rate of sheet and rill erosion

R = rainfall-runoff erosivity factor

K = soil erodibility factor

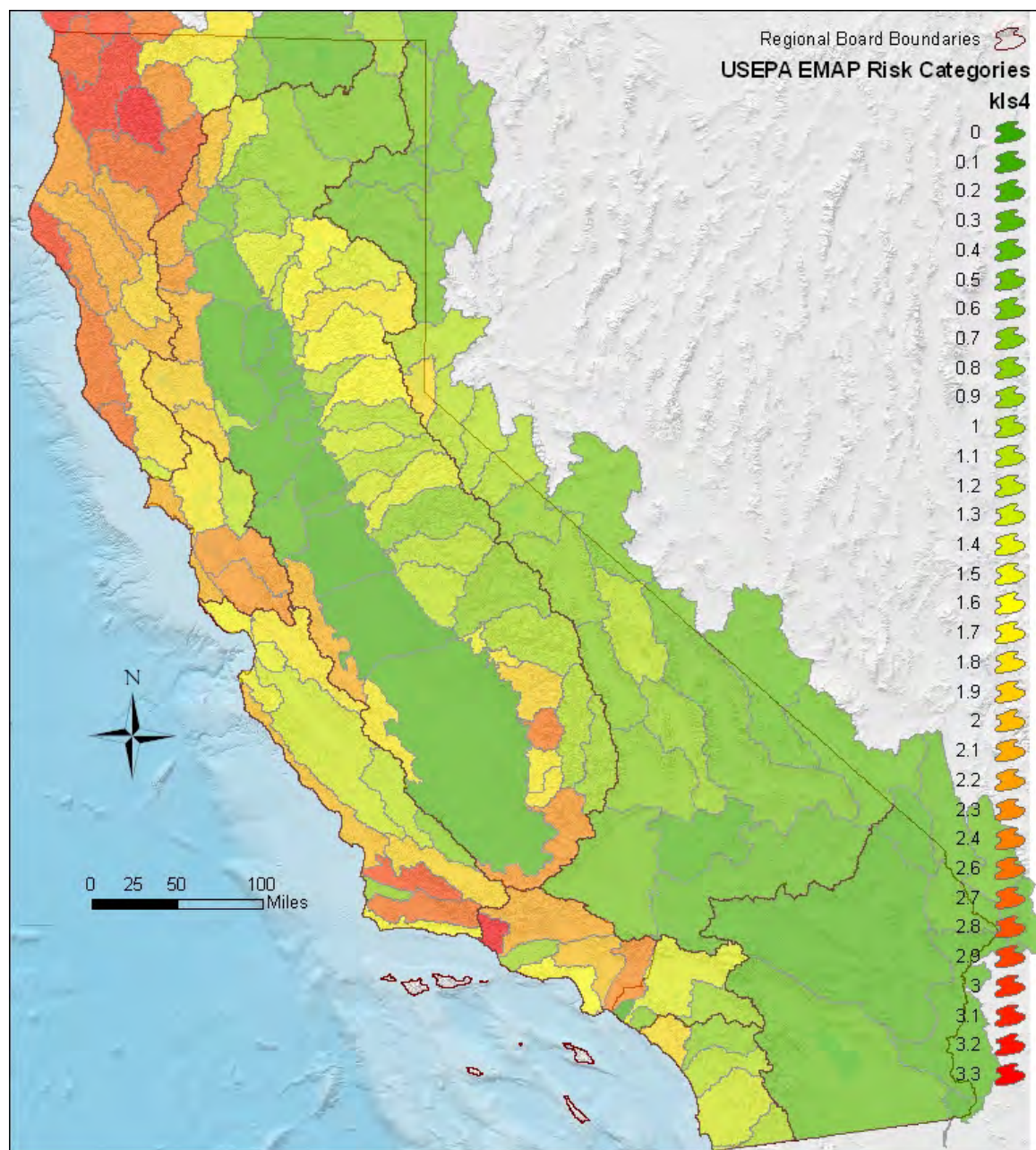
LS = length-slope factor

C = cover factor (erosion controls)

P = management operations and support practices (sediment controls)

The C and P factors are given values of 1.0 to simulate bare ground conditions.

There is a map option and a manual calculation option for determining soil loss. For the map option, the R factor for the project is calculated using the online calculator at <http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm>. The product of K and LS are shown on Figure 1. To determine soil loss in tons per acre, the discharger multiplies the R factor times the value for K times LS from the map.



State Water Resources Control Board, January 15, 2008

**Figure 1 -Statewide Map of K \* LS**

For the manual calculation option, the R factor for the project is calculated using the online calculator at <http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm>. The K and LS factors are determined using Appendix 1.

Soil loss of less than 15 tons/acre is considered **low** sediment risk.  
 Soil loss between 15 and 75 tons/acre is **medium** sediment risk.  
 Soil loss over 75 tons/acre is considered **high** sediment risk.

The soil loss values and risk categories were obtained from mean and standard deviation RKLS values from the USEPA EMAP program. High risk is the mean RKLS value plus two standard deviations. Low risk is the mean RKLS value minus two standard deviations.

#### Receiving Water Risk:

Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either

on the most recent 303d list for waterbodies impaired for sediment;  
has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; **or**  
has the beneficial uses of COLD, SPAWN, and MIGRATORY.

A project that meets at least one of the three criteria has a high receiving water risk. A list of sediment-sensitive waterbodies will be posted on the State Water Board's website. It is anticipated that an interactive map of sediment sensitive water bodies in California will be available in the future.

The Risk Levels have been altered by eliminating the possibility of a Risk Level 4, and expanding the constraints for Risk Levels 1, 2, and 3. Therefore, projects with high receiving water risk and high sediment risk will be considered a Risk Level 3 risk to water quality.

In response to public comments, the Risk Level requirements have also been changed such that Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements, Risk Level 2 projects will be subject to NALs and some additional monitoring requirements, and Risk Level 3 projects will be subject to NALs, and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment.

**Table 7 - Combined Risk Level Matrix**

| Combined Risk Level Matrix |      |               |         |         |
|----------------------------|------|---------------|---------|---------|
|                            |      |               |         |         |
| Receiving Water Risk       |      | Sediment Risk |         |         |
|                            |      | Low           | Medium  | High    |
|                            | Low  | Level 1       | Level 2 |         |
|                            | High | Level 2       |         | Level 3 |

#### b. Effluent Standards

All dischargers are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require storm water discharges associated with construction activity to meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutants and any more stringent controls necessary to meet water quality standards.

Risk Level 2 dischargers that pose a medium risk to water quality are subject to technology-based NALs for pH and turbidity. Risk Level 3 dischargers that pose a high risk to water quality are also subject to technology-based NALs for pH and turbidity.

### **c. Good Housekeeping**

Proper handling and managing of construction materials can help minimize threats to water quality. The discharger must consider good housekeeping measures for: construction materials, waste management, vehicle storage & maintenance, landscape materials, and potential pollutant sources. Examples include; conducting an inventory of products used, implementing proper storage & containment, and properly cleaning all leaks from equipment and vehicles.

### **d. Non-Storm Water Management**

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

### **e. Erosion Control**

The best way to minimize the risk of creating erosion and sedimentation problems during construction is to disturb as little of the land surface as possible by fitting the development to the terrain. When development is tailored to the natural contours of the land, little grading is necessary and, consequently, erosion potential is lower.<sup>14</sup> Other effective erosion control measures include: preserving existing vegetation where feasible, limiting disturbance, and stabilizing and re-vegetating disturbed areas as soon as possible after grading or construction activities. Particular attention must be paid to large, mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded.<sup>12</sup>

Risk Level 3 dischargers pose a higher risk to water quality and are therefore additionally required to ensure that post-construction soil loss is equivalent to or less than the pre-construction levels.

### **f. Sediment Control**

Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only

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<sup>12</sup> U.S. Environmental Protection Agency. 2007. Developing Your Storm Water Pollution Prevention Plan: A Guide for Construction Sites.



examples of what should be considered and should not preclude new or innovative approaches currently available or being developed.

Because Risk Level 2 and 3 dischargers pose a higher risk to water quality, additional requirements for the application of sediment controls are imposed on these projects. This General Permit also authorizes the Regional Water Boards to require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of other erosion or sediment controls are not adequately protecting the receiving waters.

#### **g. Run-on and Runoff Control**

Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a project site. Examples include: installing berms and other temporary run-on and runoff diversions.

Risk Level 1 dischargers with lower risks to impact water quality are not subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required.

#### **h. Inspection, Maintenance and Repair**

All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended.

#### **i. Rain Event Action Plan (REAP)**

A Rain Event Action Plan (REAP) is a written document, specific for each rain event. A REAP should be designed that when implemented it protects all exposed portions of the site within 48 hours of any likely precipitation event forecast of 50% or greater probability.

This General Permit requires Risk Level 2 and 3 dischargers to develop and implement a REAP designed to protect all exposed portions of their sites within 48 hours prior to any likely precipitation event. The REAP requirement is designed to ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures that are intended to reduce the amount of sediment and other pollutants generated from the active site. A REAP must be developed when there is likely a forecast of 50% or greater probability of precipitation in the project area. (The National Oceanic and Atmospheric Administration (NOAA) defines a chance of precipitation as a probability of precipitation of 30% to 50% chance of producing precipitation in the project area.<sup>13</sup> NOAA defines the probability of precipitation (PoP) as the likelihood of occurrence (expressed as a percent) of a measurable amount (0.01 inch or more) of liquid precipitation (or the water equivalent of frozen precipitation) during a specified period of time at any given point in the forecast area.) Forecasts are normally issued for 12-hour time periods. Descriptive terms for uncertainty and aerial coverage are used as follows:

**Table 8 -National Oceanic and Atmospheric Administration (NOAA) Definition of Probability of Precipitation (PoP)**

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<sup>13</sup> <http://www.crh.noaa.gov/lot/severe/wxterms.php>.

| PoP     | Expressions of Uncertainty | Aerial Coverage |
|---------|----------------------------|-----------------|
| 0%      | none used                  | none used       |
| 10%     | none used                  | isolated        |
| 20%     | slight chance              | isolated        |
| 30-50%  | chance                     | scattered       |
| 60-70%  | likely                     | numerous        |
| 80-100% | none used                  | none used       |

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (<http://www.srh.noaa.gov/>).

## 2. Linear Projects

### a. Linear Risk Determination

LUPs vary in complexity and water quality concerns based on the type of project. This General Permit has varying application requirements based on the project's risk to water quality. Factors that lead to the characterization of the project include location, sediment risk, and receiving water risk.

Based on the location and complexity of a project area or project section area, LUPs are separated into project types. As described below, LUPs have been categorized into three project types.

#### i. *Type 1 LUPs*

Type 1 LUPs are those construction projects where:

- (1) 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day, or
- (2) greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

Areas disturbed during construction will be returned to pre-construction conditions or equivalent protection established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization Best Management Practices (BMPs) will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

Type 1 LUPs typically do not have a high potential to impact storm water quality because (1) these construction activities are not typically conducted during a rain event, (2) these projects are normally constructed over a short period of time<sup>14</sup>, minimizing the duration that pollutants could potentially be exposed to rainfall; and (3) disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.

Type 1 LUPs are determined during the risk assessment found in Attachment A.1 to be 1) low sediment risk and low receiving water risk; 2) low sediment risk and medium receiving water risk; and 3) medium sediment risk and low receiving water risk.

This General Permit requires the discharger to ensure a SWPPP is developed for these construction activities that is specific to project type, location and characteristics.

**ii. Type 2 LUPs:**

Type 2 projects are determined to have a combination of High, Medium, and Low project sediment risk along with High, Medium, and Low receiving water risk. Like Type 1 projects, Type 2 projects are typically constructed over a short period of time. However, these projects have a higher potential to impact water quality because they:

- (1) typically occur outside the more urban/developed areas;
- (2) have larger areas of soil disturbance that are not closed or restored at the end of the day;
- (3) may have onsite stockpiles of soil, spoil and other materials;
- (4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and
- (5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location and characteristics.

**iii. Type 3 LUPs:**

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<sup>14</sup> Short period of time refers to a project duration of weeks to months, but typically less than one year in duration.

Type 3 projects are determined to have a combination of High and Medium project sediment risk along with High and Medium receiving water risk. Similar to Type 2 projects, Type 3 projects have a higher potential to impact water quality because they:

- (1) typically occur outside of the more urban/developed areas;
- (2) have larger areas of soil disturbance that are not closed or restored at the end of the day;
- (3) may have onsite stockpiles of soil, spoil and other materials;
- (4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and
- (5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location, and characteristics.

#### **b. Linear Effluent Standards**

All LUPs are subject to the narrative effluent limitations specified in the General Permit.

Type 2 and Type 3 projects are subject to technology-based NALs for pH and turbidity.

#### **c. Linear Good Housekeeping**

Improper use and handling of construction materials could potentially cause a threat to water quality. In order to ensure proper site management of these construction materials, all LUP dischargers must comply with a minimum set of Good Housekeeping measures specified in Attachment A of this General Permit.

#### **d. Linear Non-Storm Water Management**

In order to ensure control of all non-storm water discharges during construction, all LUP dischargers must comply with the Non-Storm Water Management measures specified in Attachment A of this General Permit.

#### **e. Linear Erosion Control**

This General Permit requires all LUP dischargers to implement effective wind erosion control measures, and soil cover for inactive areas. Type 3 LUPs posing a higher risk to water quality are additionally required to ensure the post-construction soil loss is equivalent to or less than the pre-construction levels.

#### **f. Linear Sediment Control**

In order to ensure control and containment of all sediment discharges, all LUP dischargers must comply with the general Sediment Control measures specified in Attachment A or this General Permit. Additional requirements for sediment controls are imposed on Type 2 & 3 LUPs due to their higher risk to water quality.

#### **g. Linear Run-on and Runoff Control**

Discharges originating outside of a project's perimeter and flowing onto the property can adversely affect the quantity and quality of discharges originating from a project site. In order to ensure proper management of run-on and runoff, all LUPs must comply with the run-on and runoff control measures specified in Attachment A of this General Permit. Due to the lower risk of impacting water quality, Type 1 LUPs are not required to implement run-on and runoff controls unless deemed necessary by the discharger.

#### **h. Linear Inspection, Maintenance and Repair**

Proper inspection, maintenance, and repair activities are important to ensure the effectiveness of on-site measures to control water quality. In order to ensure that inspection, maintenance, and repair activities are adequately performed, the all LUP dischargers are required to comply with the Inspection, Maintenance, and Repair requirements specified in Attachment A of this General Permit.

### **K. ATS<sup>15</sup> Requirements**

There are instances on construction sites where traditional erosion and sediment controls do not effectively control accelerated erosion. Under such circumstances, or under circumstances where storm water discharges leaving the site may cause or contribute to an exceedance of a water quality standard, the use of an Active Treatment System (ATS) may be necessary. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.<sup>16</sup>

Although treatment systems have been in use in some form since the mid-1990s, the ATS industry in California is relatively young, and detailed regulatory standards have not yet been developed. Many developers are using these systems to treat storm water discharges from their construction sites. The new ATS requirements set forth in this General Permit are based on those in place for small wastewater treatment systems, ATS regulations from the Central Valley Regional Water Quality Control Board (September 2005 memorandum "2005/2006 Rainy Season – Monitoring Requirements for Storm Water Treatment Systems that Utilize Chemical Additives to Enhance Sedimentation"), the Construction Storm Water Program at the State of Washington's Department of Ecology, as well as recent advances in technology and knowledge of coagulant performance and aquatic safety.

The effective design of an ATS requires a detailed survey and analysis of site conditions. With proper planning, ATS performance can provide exceptional water quality discharge and prevent significant impacts to surface water quality, even under extreme environmental conditions.

These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). The State Water Board is concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition

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<sup>15</sup> An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation in order to reduce turbidity caused by fine suspended sediment.

<sup>16</sup> Pitt, R., S. Clark, and D. Lake. 2006. Construction Site Erosion and Sediment Controls: Planning, Design, and Performance. DEStech Publications. Lancaster, PA. 370pp.

to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern.<sup>17</sup> For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation.<sup>18</sup> Due to the potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, this General Permit establishes residual polymer monitoring and toxicity testing requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.

The primary treatment process in an ATS is coagulation/flocculation. ATS's operate on the principle that the added coagulant is bound to suspended sediment, forming floc, which is gravitationally settled in tanks or a basin, or removed by sand filters. A typical installation utilizes an injection pump upstream from the clarifier tank, basin, or sand filters, which is electronically metered to both flow rate and suspended solids level of the influent, assuring a constant dose. The coagulant mixes and reacts with the influent, forming a dense floc. The floc may be removed by gravitational setting in a clarifier tank or basin, or by filtration. Water from the clarifier tank, basin, or sand filters may be routed through cartridge(s) and/or bag filters for final polishing. Vendor-specific systems use various methods of dose control, sediment/floc removal, filtration, etc., that are detailed in project-specific documentation. The particular coagulant/flocculant to be used for a given project is determined based on the water chemistry of the site because the coagulants are specific in their reactions with various types of sediments. Appropriate selection of dosage must be carefully matched to the characteristics of each site.

ATS's are operated in two differing modes, either Batch or Flow-Through. Batch treatment can be defined as Pump-Treat-Hold-Test-Release. In Batch treatment, water is held in a basin or tank, and is not discharged until treatment is complete. Batch treatment involves holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full. In Flow-Through treatment, water is pumped into the ATS directly from the runoff collection system or storm water holding pond, where it is treated and filtered as it flows through the system, and is then directly discharged. "Flow-Through Treatment" is also referred to as "Continuous Treatment."

## **1. Effluent Standards**

This General Permit establishes NELs for discharges from construction sites that utilize an ATS. These systems lend themselves to NELs for turbidity and pH because of their known reliable treatment. Advanced systems have been in use in some form since the mid-1990s. An ATS is considered reliable, can consistently produce a discharge of less than 10 NTU, and has been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels.<sup>19</sup>

This General Permit contains "compliance storm event" exceptions from the technology-based NELs for ATS discharges. The rationale is that technology-based requirements are developed assuming a certain design storm. In the case of ATS the industry-standard design storm is 10-year, 24-hour (as stated in

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<sup>17</sup> Romøen, K., B. Thu, and Ø. Evensen. 2002. Immersion delivery of plasmid DNA II. A study of the potentials of a chitosan based delivery system in rainbow trout (*Oncorhynchus mykiss*) fry. *Journal of Controlled Release* **85**: 215-225.

<sup>18</sup> Bullock, G., V. Blazer, S. Tsukuda, and S. Summerfelt. 2000. Toxicity of acidified chitosan for cultured rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* **185**:273-280.

<sup>19</sup> Currier, B., G. Minton, R. Pitt, L. Roesner, K. Schiff, M. Stenstrom, E. Strassler, and E. Strecker. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.

Attachment F of this General Permit), so the compliance storm event has been established as the 10-year 24-hour event as well to provide consistency.

## 2. Training

Operator training is critical to the safe and efficient operation and maintenance of the ATS, and to ensure that all State Water Board monitoring and sampling requirements are met. The General Permit requires that all ATS operators have training specific to using ATS's liquid coagulants.

## L. Post-Construction Requirements

Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment.

Construction activity can lead to impairment of beneficial uses in two main ways. First, during the actual construction process, storm water discharges can negatively affect the chemical, biological, and physical properties of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment, however pH and other non-visible pollutants are also of great concern. Second, after most construction activities are completed at a construction site, the finished project may result in significant modification of the site's response to precipitation. New development and redevelopment projects have almost always resulted in permanent post-construction water quality impacts because more precipitation ends up as runoff and less precipitation is intercepted, evapotranspired, and infiltrated.

General Permit 99-08-DWQ required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. An effective storm water management strategy must address the full suite of storm events (water quality, channel protection, overbank flood protection, extreme flood protection) (Figure 2).

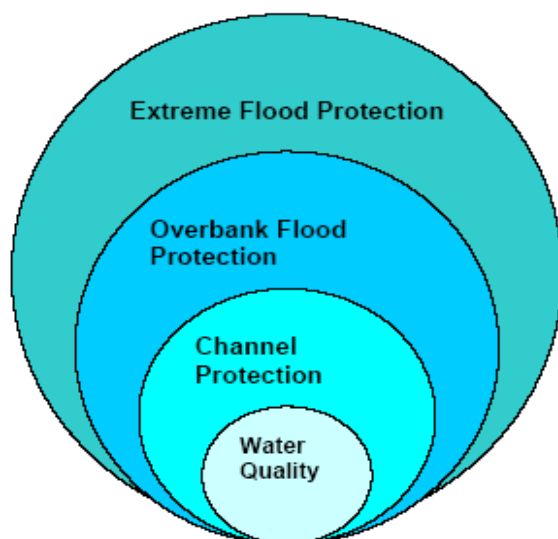


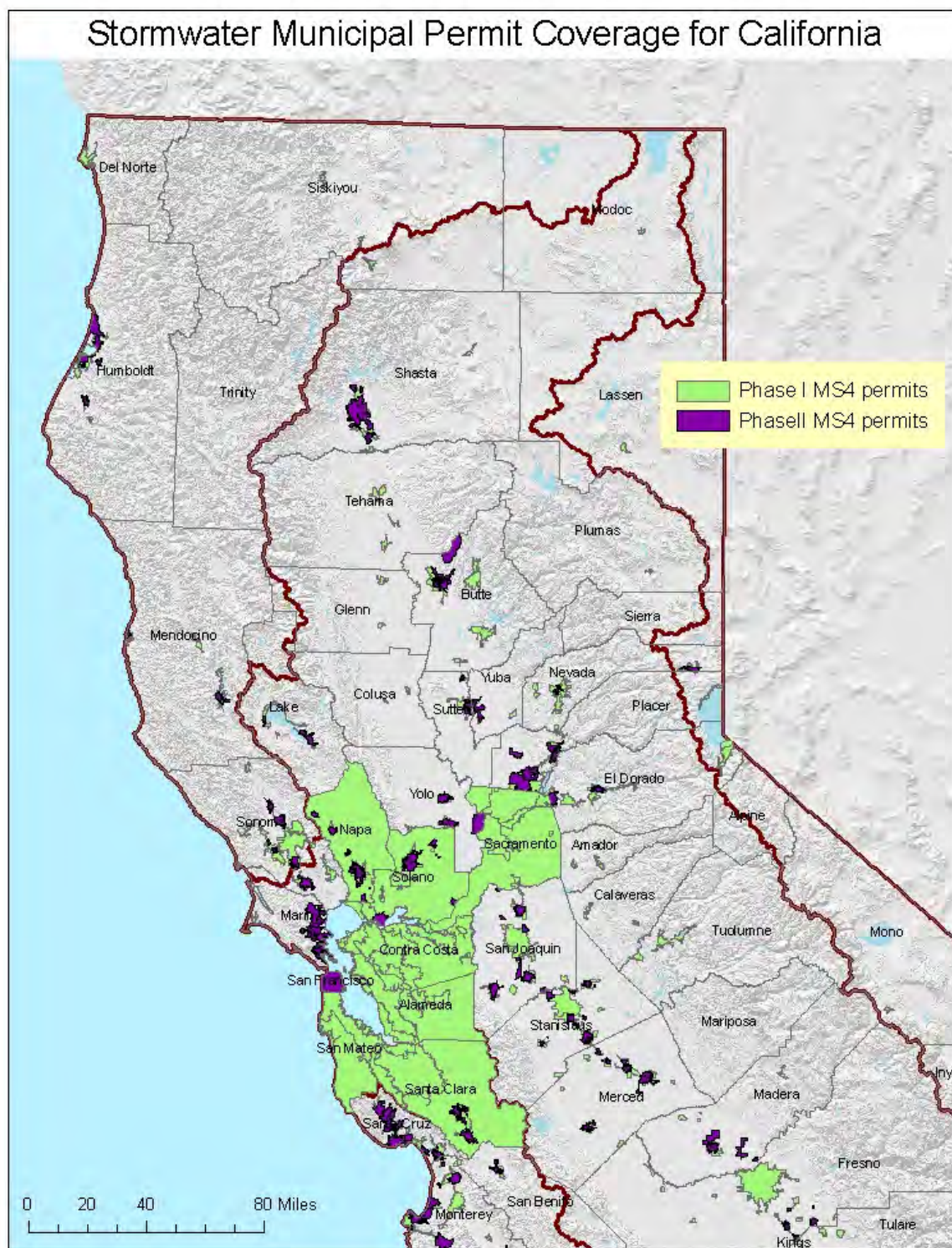
Figure 2 - Suite of Storm Events

The post-construction storm water performance standards in this General Permit specifically address water quality and channel protection events. Overbank flood protection and extreme flood protection events are traditionally dealt with in local drainage and flood protection ordinances. However, measures in this General Permit to address water quality and channel protection also reduce overbank and extreme flooding impacts. This General Permit aims to match post-construction runoff to pre-construction runoff for the 85<sup>th</sup> percentile storm event, which not only reduces the risk of impact to the receiving water's channel morphology but also provides some protection of water quality.

This General Permit clarifies that its runoff reduction requirements only apply to projects that lie outside of jurisdictions covered by a Standard Urban Storm water Management Plan (SUSMP) (or other more protective) post-construction requirements in either Phase I or Phase II permits.

Figures 3 and 4, below, show the General Permit enrollees (to Order 99-08-DWQ, as of March 10, 2008) overlaid upon a map with SUSMP (or more protective) areas in blue and purple. Areas without blue or purple indicate where the General Permit's runoff reduction requirements would actually apply.





**Figure 3 - Northern CA (2009) Counties / Cities With SUSMP-Plus Coverage**



## Stormwater Municipal Permit Coverage for California

**Figure 4 - Southern CA (2009) Counties / Cities With SUSMP-Plus Coverage**



#### Water Quality:

This General Permit requires dischargers to replicate the pre-project runoff water balance (defined as the amount of rainfall that ends up as runoff) for the smallest storms up to the 85<sup>th</sup> percentile storm event, or the smallest storm event that generates runoff, whichever is larger. Contemporary storm water management generally routes these flows directly to the drainage system, increasing pollutant loads and potentially causing adverse effects on receiving waters. These smaller water quality events happen much more frequently than larger events and generate much higher pollutant loads on an annual basis. There are other adverse hydrological impacts that result from not designing according to the site's pre-construction water balance. In Maryland, Klein<sup>20</sup> noted that baseflow decreases as the extent of urbanization increases. Ferguson and Suckling<sup>21</sup> noted a similar relation in watersheds in Georgia. On Long Island, Spinello and Simmons<sup>22</sup> noted substantial decreases in base flow in intensely urbanized watersheds.

The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapotranspiration and infiltration through non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). Employing these measures close to the source of runoff generation is the easiest and most cost-effective way to comply with the pre-construction water balance standard. Using low-tech runoff reduction techniques close to the source is consistent with a number of recommendations in the literature.<sup>23</sup> In many cases, BMPs implemented close to the source of runoff generation cost less than end-of the pipe measures.<sup>24</sup> Dischargers are given the option of using Appendix 2 to calculate the required runoff volume or a watershed process-based, continuous simulation model such as the EPA's Storm Water Management Model (SWMM) or Hydrologic Simulation Program Fortran (HSPF). Such methods used by the discharger will be reviewed by the Regional Water Board upon NOT application.

#### Channel Protection:

In order to address channel protection, a basic understanding of fluvial geomorphic concepts is necessary. A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge (1.5 to 2 year recurrence interval). The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels.<sup>25</sup> Lane (1955 as cited in Rosgen 1996<sup>26</sup>) showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope in

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<sup>20</sup> Klein 1979 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

<sup>21</sup> Ferguson and Suckling 1990 as cited Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

<sup>22</sup> Center for Watershed Protection (CWP). 2000. The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers, and estuaries. Ellicott City, MD. 741 pp.

<sup>23</sup> Bay Area Storm Water Management Agencies Association (BASMAA). 1997. Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality Protection. Palo Alto, CA; McCuen, R.H. 2003 Smart Growth: hydrologic perspective. Journal of Professional Issues in Engineering Education and Practice. Vol (129), pp.151-154;

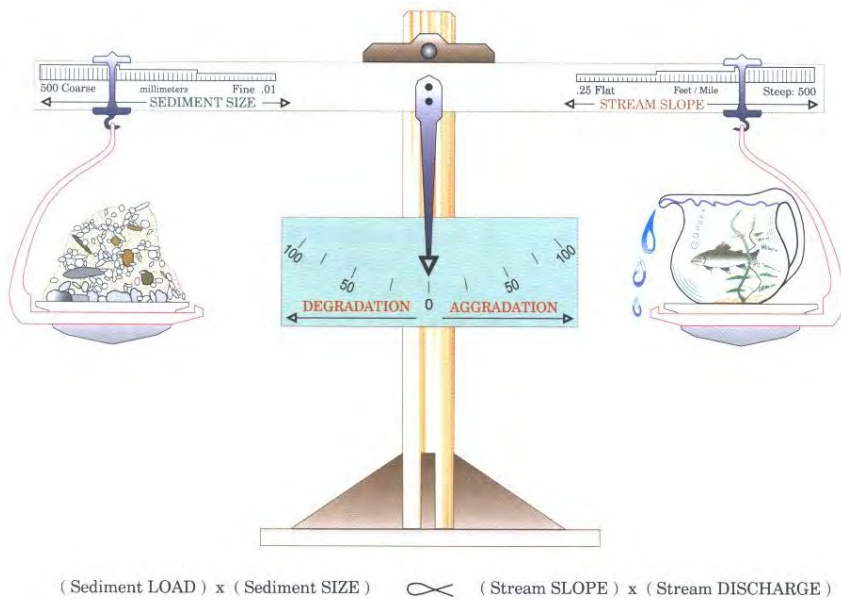
Moglen, G.E. and S. Kim. 2007. Impervious imperviousness-are threshold based policies a good idea? Journal of the American Planning Association, Vol 73 No. 2. pp 161-171.

<sup>24</sup> Delaware Department of natural Resources (DDNR). 2004. Green technology: The Delaware urban Runoff Management Approach. Dover, DE. 117 pp.

<sup>25</sup> Dunne, T and L.B. Leopold. 1978. Water in Environmental Planning. San Francisco W.H. Freeman and Company

<sup>26</sup> Rosgen. D.L. 1996. Applied River Morphology. Pagosa Springs. Wildland Hydrology

Figure 5. A change in any one of these variables sets up a series of mutual adjustments in the companion variables with a resulting direct change in the physical characteristics of the stream channel.



**Figure 5 - Schematic of the Lane Relationship**

**After Lane (1955) as cited in Rosgen (1996)**

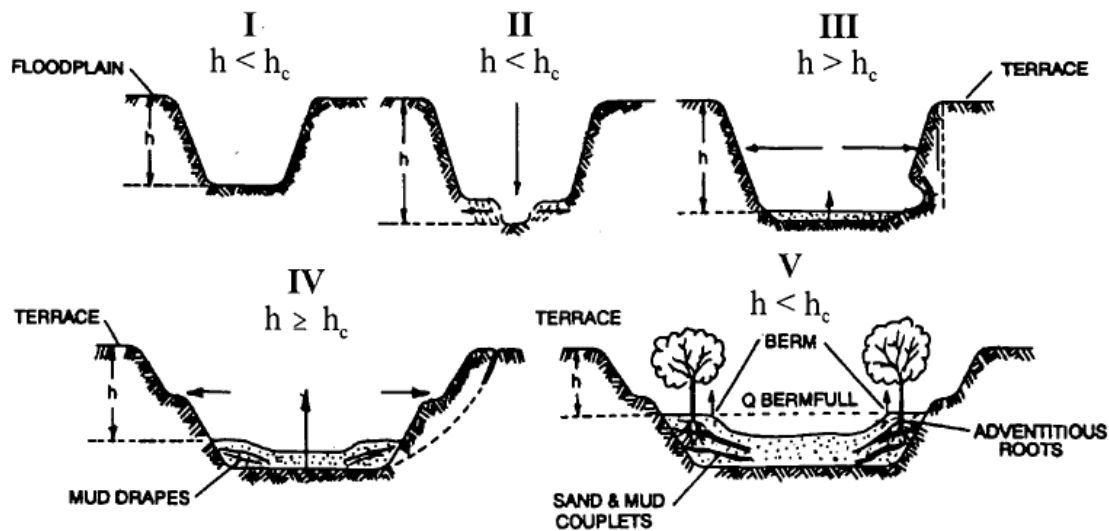
Stream slope multiplied by stream discharge (the right side of the scale) is essentially an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (sediment load and sediment size represented on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels.<sup>27</sup> Most of this sediment is delivered to stream channels during large, episodic rain events.<sup>28</sup> This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et. al (1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 6).

<sup>27</sup> Goldman S.J., K. Jackson, and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw Hill. San Francisco.

<sup>28</sup> Wolman 1967 as cited in Paul, M.P. and J.L. Meyer. 2001. Streams in the Urban Landscape. *Annu. Rev.Ecol. Syst.* 32: 333-365.



**Figure 6 - Channel Changes Associated with Urbanization**

After Incised Channel Evolution Sequence in Schumm et. al 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges.<sup>29</sup> Increased drainage density (miles of stream length per square mile of watershed) also negatively impacts receiving stream channels.<sup>30</sup> Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often "sediment starved" and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or  $d_{50}$ ) decrease during urbanization.<sup>31</sup> This means

<sup>29</sup> Booth, D. B. and C. R. Jackson. 1997. Urbanization of Aquatic Systems: Degradation Thresholds, Storm Water Detection, and the Limits of Mitigation. *Journal of the American Water Resources Association* Vol. 33, No.5, pp. 1077-1089.

<sup>30</sup> May, C.W. 1998. Cumulative effects of urbanization on small streams in the Puget Sound Lowland ecoregion. Conference proceedings from Puget Sound Research '98 held March 12, 13 1998 in Seattle, WA;

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Hydromodification Management Plan Literature Review. 80 pp.

<sup>31</sup> Finkenbine, J.K., D.S. Atwater, and D.S. Mavinic. 2000. Stream health after urbanization. *J. Am. Water Resour. Assoc.* 36:1149-60;

that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant (provided they are non-cohesive).

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power<sup>32</sup> and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel. After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening.<sup>33</sup> At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution. Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies

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Pizzuto, J.E. W.S. Hession, and M. McBride. 2000. Comparing gravel-bed rivers in paired urban and rural catchments of southeastern Pennsylvania. *Geology* 28:79-82.

<sup>32</sup> Hammer 1973 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp;

Booth, D.B. 1990. Stream Channel Incision Following Drainage Basin Urbanization. *Water Resour. Bull.* 26:407-417.

<sup>33</sup> Trimble, S.W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed. *Science*: Vol. 278 (21), pp. 1442-1444.

must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein and Zaleski 2005).<sup>34</sup>

Traditional structural water quality BMPs (e.g. detention basins and other devices used to store volumes of runoff) unless they are highly engineered to provide adequate flow duration control, do not adequately protect receiving waters from accelerated channel bed and bank erosion, do not address post-development increases in runoff volume, and do not mitigate the decline in benthic macroinvertebrate communities in the receiving waters<sup>35</sup> suggest that structural BMPs are not as effective in protecting aquatic communities as a continuous riparian buffer of native vegetation. This is supported by the findings of Zucker and White<sup>36</sup>, where instream biological metrics were correlated with the extent of forested buffers.

This General Permit requires dischargers to maintain pre-development drainage densities and times of concentration in order to protect channels and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

There are a number of other approaches for modeling fluvial systems, including statistical and physical models and simpler stream power models.<sup>37</sup> The use of these models in California is described in Stein and Zaleski (2005).<sup>38</sup> Rather than prescribe a specific one-size-fits-all modeling method in this permit, the State Water Board intends to develop a stream power and channel evolution model-based framework to assess channels and develop a hierarchy of suitable analysis methods and management strategies. In time, this framework may become a State Water Board water quality control policy.

#### Permit Linkage to Overbank and Extreme Flood Protection

Site design BMPs (e.g. rooftop and impervious disconnection, vegetated swales, setbacks and buffers) filter and settle out pollutants and provide for more infiltration than is possible for traditional centralized structural BMPs placed at the lowest point in a site. They provide source control for runoff and lead to a reduction in pollutant loads. When implemented, they also help reduce the magnitude and volume of larger, less frequent storm events (e.g., 10-yr, 24-hour storm and larger), thereby reducing the need for expensive flood control infrastructure. Nonstructural BMPs can also be a landscape amenity, instead of a large isolated structure requiring substantial area for ancillary access, buffering, screening and maintenance facilities.<sup>25</sup> The multiple benefits of using non-structural benefits will be critically important as the state's population increases and imposes strains upon our existing water resources.

Maintaining predevelopment drainage densities and times of concentration will help reduce post-development peak flows and volumes in areas not covered under a municipal permit. The most effective way to preserve drainage areas and maximize time of concentration is to implement landform grading,

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<sup>34</sup> Stein, E.S. and S. Zaleski. 2005. Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

<sup>35</sup> Horner, R.R. 2006. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (LID) for the San Diego Region. Available at: [http://www.projectcleanwater.org/pdf/permit/case-study\\_lid.pdf](http://www.projectcleanwater.org/pdf/permit/case-study_lid.pdf).

<sup>36</sup> Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.

<sup>37</sup> Finlayson, D.P. and D.R. Montgomery. 2003. Modeling large-scale fluvial erosion in geographic information systems. *Geomorphology* (53), pp. 147-164.

<sup>38</sup> Stein, E.S. and S. Zaleski. 2005. Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

incorporate site design BMPs and implement distributed structural BMPs (e.g., bioretention cells, rain gardens, rain cisterns).

## **M. Storm Water Pollution Prevention Plans**

USEPA's Construction General Permit requires that qualified personnel conduct inspections. USEPA defines qualified personnel as "a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity."<sup>39</sup> USEPA also suggests that qualified personnel prepare SWPPPs and points to numerous states that require certified professionals to be on construction sites at all times. States that currently have certification programs are Washington, Georgia, Florida, Delaware, Maryland, and New Jersey. The Permit 99-08-DWQ did not require that qualified personnel prepare SWPPPs or conduct inspections. However, to ensure that water quality is being protected, this General Permit requires that all SWPPPs be written, amended, and certified by a Qualified SWPPP Developer. A Qualified SWPPP Developer must possess one of the eight certifications and or registrations specified in this General Permit and effective two years after the adoption date of this General Permit, must have attended a State Water Board-sponsored or approved Qualified SWPPP Developer training course. Table 9 provides an overview of the criteria used in determining qualified certification titles for a QSD and QSP.

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39 US Environmental Protection Agency. Stormwater Pollution Prevention Plans for Construction Activities. <<http://cfpub.epa.gov/npdes/stormwater/swppp.cfm>> and <[http://www.epa.gov/npdes/pubs/sw\\_swppp\\_guide.pdf](http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf)>.



Table 9 - Qualified SWPPP Developer/ Qualified SWPPP Practitioner Certification Criteria

| Certification/ Title                                            | Registered By                                             | QSD/QSP | Certification Criteria                                                                                        |
|-----------------------------------------------------------------|-----------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------|
| Professional Civil Engineer                                     | California                                                | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites                            |
| Professional Geologist or Engineering Geologist                 | California                                                | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites                            |
| Landscape Architect                                             | California                                                | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites                            |
| Professional Hydrologist                                        | American Institute of Hydrology                           | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites                            |
| Certified Professional in Erosion and Sediment Control™ (CPESC) | Enviro Cert International Inc.                            | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites<br>5. Continuing Education |
| Certified Inspector of Sediment and Erosion Control™ (CISEC)    | Certified Inspector of Sediment and Erosion Control, Inc. | QSP     | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites<br>5. Continuing Education |
| Certified Erosion, Sediment and Storm Water Inspector™ (CESSWI) | Enviro Cert International Inc.                            | QSP     | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites<br>5. Continuing Education |
| Certified Professional in Storm Water Quality™ (CPSWQ)          | Enviro Cert International Inc.                            | Both    | 1. Approval Process<br>2. Code of Ethics<br>3. Accountability<br>4. Pre-requisites<br>5. Continuing Education |

The previous versions of the General Permit required development and implementation of a SWPPP as the primary compliance mechanism. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The SWPPP must include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

This General Permit shifts some of the measures that were covered by this general requirement to specific permit requirements, each individually enforceable as a permit term. This General Permit emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities. These specific requirements also improve both the clarity and the enforceability of the General Permit so that the dischargers understand, and the public can determine whether the discharges are in compliance with, permit requirements.

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the General Permit. For LUPs the discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. Once construction activities are complete, until stabilization is achieved, the SWPPP shall be available from the SWPPP contact listed in the PRDs

A SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs needed to address all possible generated pollutants

## **N. Regional Water Board Authorities**

Because this General Permit will be issued to thousands of construction sites across the State, the Regional Water Boards retain discretionary authority over certain issues that may arise from the discharges in their respective regions. This General Permit does not grant the Regional Water Boards any authority they do not otherwise have; rather, it merely emphasizes that the Regional Water Boards can take specific actions related to this General Permit. For example, the Regional Water Boards will be enforcing this General Permit and may need to adjust some requirements for a discharger based on the discharger's compliance history.



Linda S. Adams  
Secretary for  
Environmental Protection

# State Water Resources Control Board

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455  
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100  
Fax (916) 341-5463 • <http://www.waterboards.ca.gov>



Arnold Schwarzenegger  
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
GENERAL PERMIT FOR  
STORM WATER DISCHARGES  
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE  
ACTIVITIES

ORDER NO. 2009-0009-DWQ  
NPDES NO. **CAS000002**

|                                                                       |                          |
|-----------------------------------------------------------------------|--------------------------|
| This Order was adopted by the State Water Resources Control Board on: | <b>September 2, 2009</b> |
| This Order shall become effective on:                                 | <b>July 1, 2010</b>      |
| This Order shall expire on:                                           | <b>September 2, 2014</b> |

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend  
Clerk to the Board



Linda S. Adams  
Secretary for  
Environmental Protection

# State Water Resources Control Board

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455  
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Arnold Schwarzenegger  
Governor

### NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

**ORDER NO. 2010-0014-DWQ**

**NPDES NO. CAS000002**

|                                                                                                              |                          |
|--------------------------------------------------------------------------------------------------------------|--------------------------|
| Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:                           | <b>September 2, 2009</b> |
| Order No. 2009-0009-DWQ became effective on:                                                                 | <b>July 1, 2010</b>      |
| Order No. 2009-0009-DWQ shall expire on:                                                                     | <b>September 2, 2014</b> |
| This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on: | <b>November 16, 2010</b> |
| This Order shall become effective on:                                                                        | <b>February 14, 2011</b> |

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in ~~red-strikeout~~ text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010**.

AYE: Chairman Charles R. Hoppin  
Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

*Jeanine Townsend*

Jeanine Townsend  
Clerk to the Board



EDMUND G. BROWN JR.  
GOVERNOR



MATTHEW RODRIGUEZ  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

## State Water Resources Control Board

### NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ  
NPDES NO. **CAS000002**

|                                                                                                                                          |                          |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:                                                       | <b>September 2, 2009</b> |
| Order No. 2009-0009-DWQ became effective on:                                                                                             | <b>July 1, 2010</b>      |
| Order No. 2010-0014-DWQ became effective on:                                                                                             | <b>February 14, 2011</b> |
| Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ shall expire on:                                                                     | <b>September 2, 2014</b> |
| This Order, which amends Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, was adopted by the State Water Resources Control Board on: | <b>July 17, 2012</b>     |
| This Order No. 2012-0006-DWQ shall become effective on:                                                                                  | <b>July 17, 2012</b>     |

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in ~~red-strikeout~~ text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE: Chairman Charles R. Hoppin  
Vice Chair Frances Spivy-Weber  
Board Member Tam M. Doduc  
Board Member Steven Moore  
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend  
Clerk to the Board

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Appendix 3 – Bioassessment Monitoring Guidelines  
Appendix 4 – Adopted/Implemented Sediment TMDLs  
Appendix 5 – Glossary  
Appendix 6 – Acronyms  
Appendix 7 – State and Regional Water Resources Control Board Contacts

**STATE WATER RESOURCES CONTROL BOARD  
ORDER NO. 2009-0009-DWQ  
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
GENERAL PERMIT NO. CAS000002**

**WASTE DISCHARGE REQUIREMENTS  
FOR  
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH  
CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES**

**I. FINDINGS**

**A. General Findings**

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.
2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.
4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.
5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.
6. Pursuant to 40 C.F.R. § 131.12 and State Water Board [Resolution No. 68-16](#),<sup>1</sup> which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.
7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.
8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.
9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

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<sup>1</sup> Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.



10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.
11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.
12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.
13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.
14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.
15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.
16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.
17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

## **B. Activities Covered Under the General Permit**

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.
19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.
21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.
22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.<sup>2</sup>
23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

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<sup>2</sup> Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

**C. Activities Not Covered Under the General Permit**

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.
25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.
26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.
27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.
28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
29. Construction activity covered by an individual NPDES Permit for storm water discharges.
30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 ("R" in the Revised Universal Soil Loss Equation).
31. Landfill construction activity that is subject to the Industrial General Permit.
32. Construction activity that discharges to Combined Sewer Systems.
33. Conveyances that discharge storm water runoff combined with municipal sewage.
34. Discharges of storm water identified in CWA § 402(l)(2), 33 U.S.C. § 1342(l)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

#### **D. Obtaining and Modifying General Permit Coverage**

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.
37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.
38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and [No. 2003-0007-DWQ](#). For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

#### **E. Prohibitions**

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)<sup>3</sup>. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.
42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.
43. This General Permit prohibits the discharge of any debris<sup>4</sup> from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

## **F. Training**

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.
45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

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<sup>3</sup> BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

<sup>4</sup> Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

## **G. Determining and Reducing Risk**

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.
47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.
48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.
49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.
50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS<sup>5</sup>) can prevent or reduce the release of fine particles from construction sites.

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<sup>5</sup> An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

## **H. Effluent Standards**

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, "The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities," dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel's suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

### **Determining Compliance with Numeric Limitations**

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.
54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

#### **I. Receiving Water Limitations**

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

#### **J. Sampling, Monitoring, Reporting and Record Keeping**

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.
57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.
58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.
59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.
60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.
61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.
62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.



- 63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.
- 64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.
- 65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.
- 66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

#### **K. Active Treatment System (ATS) Requirements**

- 67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.
- 68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.
- 69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.
- 70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

#### **L. Post-Construction Requirements**

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board [Resolution No. 2005-0006](#), "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and [2008-0030](#), "Requiring Sustainable Water Resources Management." The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This "runoff reduction" approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.
73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

#### **M. Storm Water Pollution Prevention Plan Requirements**

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.
75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

#### **N. Regional Water Board Authorities**

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

**IT IS HEREBY ORDERED** that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)<sup>6</sup>:

## **II. CONDITIONS FOR PERMIT COVERAGE**

### **A. Linear Underground/Overhead Projects (LUPs)**

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.
2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.
3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

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<sup>6</sup> These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

## **B. Obtaining Permit Coverage Traditional Construction Sites**

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.
2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.
3. PRDs shall consist of:
  - a. Notice of Intent (NOI)
  - b. Risk Assessment (Section VIII)
  - c. Site Map
  - d. Storm Water Pollution Prevention Plan (Section XIV)
  - e. Annual Fee
  - f. Signed Certification Statement

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.
  - a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.
  - b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.
6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.
7. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the

rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

### **C. Revising Permit Coverage for Change of Acreage or New Ownership**

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.
2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:
  - a. A revised NOI indicating the new project size;
  - b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.
  - c. SWPPP revisions, as appropriate; and
  - d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.
  - e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved “Final Stabilization” as defined in Section II.D.
4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit’s requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP’s approved signatory, must submit PRDs in accordance with this General Permit’s requirements.

#### **D. Conditions for Termination of Coverage**

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:
  - a. For purposes of “final stabilization,” the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;
  - b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;
  - c. Final stabilization has been reached;
  - d. Construction materials and wastes have been disposed of properly;
  - e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;
  - f. Post-construction storm water management measures have been installed and a long-term maintenance plan<sup>7</sup> has been established; and
  - g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

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<sup>7</sup> For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.



2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.
3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:
  - a. "70% final cover method," no computational proof required

**OR:**

- b. "RUSLE or RUSLE2 method," computational proof required

**OR:**

- c. "Custom method", the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.

### III. DISCHARGE PROHIBITIONS

- A.** Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.
- B.** All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.
- C.** Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

  - 1. The discharge does not cause or contribute to a violation of any water quality standard;
  - 2. The discharge does not violate any other provision of this General Permit;
  - 3. The discharge is not prohibited by the applicable Basin Plan;
  - 4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
  - 5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
  - 6. The discharge is monitored and meets the applicable NALs; and
  - 7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

- D.** Debris resulting from construction activities are prohibited from being discharged from construction sites.
- E.** When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

## **IV. SPECIAL PROVISIONS**

### **A. Duty to Comply**

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.
2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

### **B. General Permit Actions**

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.
2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

### **C. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

### **D. Duty to Mitigate**

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

**E. Proper Operation and Maintenance**

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

**F. Property Rights**

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

**G. Duty to Maintain Records and Provide Information**

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.
2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

**H. Inspection and Entry**

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

#### **I. Electronic Signature and Certification Requirements**

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.
2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.
3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

#### **J. Certification**

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**K. Anticipated Noncompliance**

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

**L. Bypass**

Bypass<sup>8</sup> is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;<sup>9</sup>
2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;
3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or
4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

**M. Upset**

1. A discharger that wishes to establish the affirmative defense of an upset<sup>10</sup> in an action brought for noncompliance shall demonstrate,

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<sup>8</sup> The intentional diversion of waste streams from any portion of a treatment facility

<sup>9</sup> Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

<sup>10</sup> An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

- a. An upset occurred and that the discharger can identify the cause(s) of the upset
  - b. The treatment facility was being properly operated by the time of the upset
  - c. The discharger submitted notice of the upset as required; and
  - d. The discharger complied with any remedial measures required
2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.
  3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

#### **N. Penalties for Falsification of Reports**

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

#### **O. Oil and Hazardous Substance Liability**

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

#### **P. Severability**

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

#### **Q. Reopener Clause**



This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

#### **R. Penalties for Violations of Permit Conditions**

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500<sup>11</sup> per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

#### **S. Transfers**

This General Permit is not transferable.

#### **T. Continuation of Expired Permit**

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

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<sup>11</sup> May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

## V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

### A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

**Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units**

| Parameter | Test Method                                                      | Discharge Type | Min. Detection Limit | Units    | Numeric Action Level               |
|-----------|------------------------------------------------------------------|----------------|----------------------|----------|------------------------------------|
| pH        | Field test with calibrated portable instrument                   | Risk Level 2   | 0.2                  | pH units | lower NAL = 6.5<br>upper NAL = 8.5 |
|           |                                                                  | Risk Level 3   |                      |          | lower NAL = 6.5<br>upper NAL = 8.5 |
| Turbidity | EPA 0180.1 and/or field test with calibrated portable instrument | Risk Level 2   | 1                    | NTU      | 250 NTU                            |
|           |                                                                  | Risk Level 3   |                      |          | 250 NTU                            |

### B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.
3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.
4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:
  - a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

**AND/OR:**

- b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

**C. Receiving Water Monitoring Triggers**

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge<sup>12</sup> fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

2. Risk Level 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.
3. Risk Level 3 dischargers with direct discharges to surface waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif>

<http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif>

Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

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<sup>12</sup> A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

## **VI.RECEIVING WATER LIMITATIONS**

- A.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.
- B.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.
- C.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).
- D.** Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

## VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

### A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

### B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
  - a. A California registered professional civil engineer;
  - b. A California registered professional geologist or engineering geologist;
  - c. A California registered landscape architect;
  - d. A professional hydrologist registered through the American Institute of Hydrology;
  - e. A Certified Professional in Erosion and Sediment Control (CPESC)<sup>TM</sup> registered through Enviro Cert International, Inc.;
  - f. A Certified Professional in Storm Water Quality (CPSWQ)<sup>TM</sup> registered through Enviro Cert International, Inc.; or
  - g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.
3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:
  - a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or
  - b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.
5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.
6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

## VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,<sup>13</sup> the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

## **IX. RISK LEVEL 1 REQUIREMENTS**

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

## **X. RISK LEVEL 2 REQUIREMENTS**

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

## **XI. RISK LEVEL 3 REQUIREMENTS**

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

## **XII. ACTIVE TREATMENT SYSTEMS (ATS)**

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

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<sup>13</sup> Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres <http://cain.ice.ucdavis.edu/calwater/calwfaq.html>, <http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175> .



### **XIII. POST-CONSTRUCTION STANDARDS**

- A.** All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.
1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.
  2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.
  3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85<sup>th</sup> percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.
  4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream<sup>14</sup> or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

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<sup>14</sup> A first order stream is defined as a stream with no tributaries.

- B.** All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

#### **XIV. SWPPP REQUIREMENTS**

- A.** The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:
1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
  2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
  3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;
  4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
  5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.
- B.** To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.
- C.** The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

## **XV. REGIONAL WATER BOARD AUTHORITIES**

- A.** In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.
- B.** Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.
- C.** Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.
- D.** Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.
- E.** Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

## **XVI. ANNUAL REPORTING REQUIREMENTS**

- A.** All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.
- B.** The discharger shall certify each Annual Report in accordance with the Special Provisions.
- C.** The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.
- D.** The discharger shall include storm water monitoring information in the Annual Report consisting of:
  - 1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;
  - 2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");
  - 3. a summary of all corrective actions taken during the compliance year;
  - 4. identification of any compliance activities or corrective actions that were not implemented;
  - 5. a summary of all violations of the General Permit;
  - 6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;
  - 7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and
  - 8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.
- E.** The discharger shall provide training information in the Annual Report consisting of:
  - 1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

**ATTACHMENT A**  
**Linear Underground/ Overhead Requirements**

|                                                                        |    |
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| A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS ....             | 1  |
| B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs) .....           | 3  |
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All Linear Underground/Overhead project dischargers who submit permit registration documents (PRDs) indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

**A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS**

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.
2. LUP evaluation shall consist of two tasks:

- a. Confirm that the project or project section(s) qualifies as an LUP. The State Water Board website contains a project determination guidance flowchart.  
[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/constructionpermits.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/constructionpermits.shtml)
  - b. Identify which Type(s) (1, 2 or 3 described in Section I below) are applicable to the project or project sections based on project sediment and receiving water risk. (See Attachment A.1)
- 3.** A Legally Responsible Person (LRP) for a Linear Underground/Overhead project is required to obtain CGP coverage under one or more permit registration document (PRD) electronic submittals to the State Water Board's Storm Water Multi-Application and Report Tracking (SMARTs) system. Attachment A.1 contains a flow chart to be used when determining if a linear project qualifies for coverage and to determine LUP Types. Since a LUP may be constructed within both developed and undeveloped locations and portions of LUPs may be constructed by different contractors, LUPs may be broken into logical permit sections. Sections may be determined based on portions of a project conducted by one contractor. Other situations may also occur, such as the time period in which the sections of a project will be constructed (e.g. project phases), for which separate permit coverage is possible. For projects that are broken into separate sections, a description of how each section relates to the overall project and the definition of the boundaries between sections shall be clearly stated.
- 4.** Where construction activities transverse or enter into different Regional Water Board jurisdictions, LRPs shall obtain permit coverage for each Regional Water Board area involved prior to the commencement of construction activities.
- 5. Small Construction Rainfall Erosivity Waiver**

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.



If a small linear construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

## **B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs)**

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted. PRDs shall consist of the following:

### **1. Notice of Intent (NOI)**

Prior to construction activities, the LRP of a proposed linear underground/overhead project shall utilize the processes and methods provided in Attachment A.2, Permit Registration Documents (PRDs) – General Instructions for Linear Underground/Overhead Projects to comply with the Construction General Permit.

### **2. Site Maps**

LRPs submitting PRDs shall include at least 3 maps. The first map will be a zoomed<sup>1</sup> 1000-1500 ft vicinity map that shows the starting point of the project. The second will be a zoomed map of 1000-1500 ft showing the ending location of the project. The third will be a larger view vicinity map, 1000 ft to 2000 ft, displaying the entire project location depending on the project size, and indicating the LUP type (1, 2 or 3) areas within the total project footprint.

### **3. Drawings**

LRPs submitting PRDs shall include a construction drawing(s) or other appropriate drawing(s) or map(s) that shows the locations of storm drain

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<sup>1</sup> An image with a close-up/enhanced detailed view of site features that show minute details such as streets and neighboring structures.

Or: An image with a close-up/enhanced detailed view of the site's surrounding infrastructure.

Or: An image with a close up detailed view of the project and its surroundings.

inlets and waterbodies<sup>2</sup> that may receive discharges from the construction activities and that shows the locations of BMPs to be installed for all those BMPs that can be illustrated on the revisable drawing(s) or map(s). If storm drain inlets, waterbodies, and/or BMPs cannot be adequately shown on the drawing(s) or map(s) they should be described in detail within the SWPPP.

#### **4. Storm Water Pollution Prevention Plan (SWPPP)**

LUP dischargers shall comply with the SWPPP Preparation, Implementation, and Oversight requirements in Section K of this Attachment.

#### **5. Contact information**

LUP dischargers shall include contact information for all contractors (or subcontractors) responsible for each area of an LUP project. This should include the names, telephone numbers, and addresses of contact personnel. Specific areas of responsibility of each contact, and emergency contact numbers should also be included.

6. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

### **C. LINEAR PROJECT TERMINATION OF COVERAGE REQUIREMENTS**

The LRP may terminate coverage of an LUP when construction activities are completed by submitting an electronic notice of termination (NOT) through the State Water Board's SMARTS system. Termination requirements are different depending on the complexity of the LUP. An LUP is considered complete when: (a) there is no potential for construction-related storm water pollution; (b) all elements of the SWPPP have been completed; (c) construction materials and waste have been disposed of properly; (d) the site is in compliance with all local storm water management requirements; and (e) the LRP submits a notice of termination (NOT) and has received approval for termination from the appropriate Regional Water Board office.

#### **1. LUP Stabilization Requirements**

The LUP discharger shall ensure that all disturbed areas of the construction site are stabilized prior to termination of coverage under this General Permit. Final stabilization for the purposes of submitting an NOT

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<sup>2</sup> Includes basin(s) that the MS4 storm sewer systems may drain to for Hydromodification or Hydrological Conditional of Concerns under the MS4 permits.

is satisfied when all soil disturbing activities are completed and one of the following criteria is met:

- a. In disturbed areas that were vegetated prior to construction activities of the LUP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions. Where preconstruction vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: if the preconstruction vegetation covers 50 percent of the ground surface, 70 percent of 50 percent ( $.70 \times .50 = .35$ ) would require 35 percent total uniform surface coverage; or
- b. Where no vegetation is present prior to construction, the site is returned to its original line and grade and/or compacted to achieve stabilization; or
- c. Equivalent stabilization measures have been employed. These measures include, but are not limited to, the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

## **2. LUP Termination of Coverage Requirements**

The LRP shall file an NOT through the State Water Board's SMARTS system. By submitting an NOT, the LRP is certifying that construction activities for an LUP are complete and that the project is in full compliance with requirements of this General Permit and that it is now compliant with soil stabilization requirements where appropriate. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated.

## **3. Revising Coverage for Change of Acreage**

When the LRP of a portion of an LUP construction project changes, or when a phase within a multi-phase project is completed, the LRP may reduce the total acreage covered by this General Permit. In reducing the acreage covered by this General Permit, the LRP shall electronically file revisions to the PRDs that include:

- a. a revised NOI indicating the new project size;
- b. a revised site map showing the acreage of the project completed, acreage currently under construction, acreage sold, transferred or added, and acreage currently stabilized.
- c. SWPPP revisions, as appropriate; and
- d. certification that any new LRPs have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address (if known) of the new LRP.

If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

#### **D. DISCHARGE PROHIBITIONS**

1. LUP dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.
2. LUP dischargers are prohibited from discharging non-storm water that is not otherwise authorized by this General Permit. Non-storm water discharges authorized by this General Permit<sup>3</sup> may include, fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, street cleaning, dewatering,<sup>4</sup> uncontaminated groundwater from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials on site. These authorized non-storm water discharges:

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<sup>3</sup> Dischargers must identify all authorized non-storm water discharges in the LUP's SWPPP and identify BMPs that will be implemented to either eliminate or reduce pollutants in non-storm water discharges. Regional Water Boards may direct the discharger to discontinue discharging such non-storm water discharges if determined that such discharges discharge significant pollutants or threaten water quality.

<sup>4</sup>Dewatering activities may be prohibited or need coverage under a separate permit issued by the Regional Water Boards. Dischargers shall check with the appropriate Regional Water Boards for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

- a. Shall not cause or contribute to a violation of any water quality standard;
- b. Shall not violate any other provision of this General Permit;
- c. Shall not violate any applicable Basin Plan;
- d. Shall comply with BMPs as described in the SWPPP;
- e. Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
- f. Shall be monitored and meets the applicable NALs; and
- g. Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by this General Permit to determine the need for a separate NPDES permit.

Additionally, some LUP dischargers may be required to obtain a separate permit if the applicable Regional Water Board has adopted a General Permit for dewatering discharges. Wherever feasible, alternatives, that do not result in the discharge of non-storm water, shall be implemented in accordance with this Attachment's Section K.2 - SWPPP Implementation Schedule.

- 3. LUP dischargers shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated<sup>5</sup> are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to an NPDES permit.

When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LUP discharger shall have those soils sampled and tested to ensure that proper handling and public safety measures are

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<sup>5</sup> Contaminated soil contains pollutants in concentrations that exceed the appropriate thresholds that various regulatory agencies set for those substances. Preliminary testing of potentially contaminated soils will be based on odor, soil discoloration, or prior history of the site's chemical use and storage and other similar factors. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The legally responsible person will notify the appropriate local, State, or federal agency(ies) when contaminated soil is found at a construction site, and will notify the Regional Water Board by submitting an NOT at the completion of the project.

implemented. The LUP discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

4. Discharging any pollutant-laden water that will cause or contribute to an exceedance of the applicable Regional Water Board's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain is prohibited.
5. Debris<sup>6</sup> resulting from construction activities are prohibited from being discharged from construction project sites.

## **E. SPECIAL PROVISIONS**

### **1. Duty to Comply**

- a. The LUP discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.
- b. The LUP discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

### **2. General Permit Actions**

- a. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

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<sup>6</sup> Litter, rubble, discarded refuse, and remains of something destroyed.

- b. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

### **3. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for an LUP discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

### **4. Duty to Mitigate**

The LUP discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

### **5. Proper Operation and Maintenance**

The LUP discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of the Storm Water Pollution Prevention Plan (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

### **6. Property Rights**

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

### **7. Duty to Maintain Records and Provide Information**

- a. The LUP discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be kept at the construction site or in a crew

member's vehicle until construction is completed, and shall be made available upon request.

- b. The LUP discharger shall furnish the Regional Water Board, State Water Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The LUP discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

## **8. Inspection and Entry**

The LUP discharger shall allow the Regional Water Board, State Water Board, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;
- b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
- c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
- d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

## **9. Electronic Signature and Certification Requirements**

- a. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.
- b. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or



together with any reports, information or applications to be signed by an Approved Signatory.

- c. All SWPPP revisions, annual reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, USEPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

## **10. Certification**

Any person signing documents under Section E.9 above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

## **11. Anticipated Noncompliance**

The LUP discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

## **12. Penalties for Falsification of Reports**

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

## **13. Oil and Hazardous Substance Liability**

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the LUP discharger is or may be subject to under Section 311 of the CWA.

#### **14. Severability**

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

#### **15. Reopener Clause**

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

#### **16. Penalties for Violations of Permit Conditions**

- a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500<sup>7</sup> per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
- b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

#### **17. Transfers**

This General Permit is not transferable. A new LRP of an ongoing construction activity must submit PRDs in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An LRP who is a property owner with active General Permit coverage who sells a fraction or all the land shall inform the new property owner(s) of the requirements of this General Permit.

#### **18. Continuation of Expired Permit**

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those

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<sup>7</sup> May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act

dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

## **F. EFFLUENT STANDARDS & RECEIVING WATER MONITORING**

### **1. Narrative Effluent Limitations**

- a. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges regulated by this General Permit do not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
- b. LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of structural or non-structural controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

**Table 1. Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units**

| <b>Parameter</b> | <b>Test Method</b>                                               | <b>Discharge Type</b> | <b>Min. Detection Limit</b> | <b>Units</b> | <b>Numeric Action Level</b>        |
|------------------|------------------------------------------------------------------|-----------------------|-----------------------------|--------------|------------------------------------|
| pH               | Field test with calibrated portable instrument                   | LUP Type 2            | 0.2                         | pH units     | lower NAL = 6.5<br>upper NAL = 8.5 |
|                  |                                                                  | LUP Type 3            |                             |              | lower NAL = 6.5<br>upper NAL = 8.5 |
| Turbidity        | EPA 0180.1 and/or field test with calibrated portable instrument | LUP Type 2            | 1                           | NTU          | 250 NTU                            |
|                  |                                                                  | LUP Type 3            |                             |              | 250 NTU                            |

## 2. Numeric Action Levels (NALs)

- a. For LUP Type 2 and 3 dischargers, the lower storm event daily average NAL for pH is 6.5 pH units and the upper storm event daily average NAL for pH is 8.5 pH units. The LUP discharger shall take actions as described below if the storm event daily average discharge is outside of this range of pH values.
- b. For LUP Type 2 and 3 dischargers, the storm event daily average NAL for turbidity is 250 NTU. The discharger shall take actions as described below if the storm event daily average discharge is outside of this range of turbidity values.
- c. Whenever daily average analytical effluent monitoring results indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the LUP discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.
- d. The site evaluation will be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:
  - i. Are related to the construction activities and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

### AND/OR:

- ii. Are related to the run-on associated with the construction site location and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) decide what corrective action(s) were taken or will be taken, including a description of the schedule for completion.

## 3. Receiving Water Monitoring Triggers

- a. The receiving water monitoring triggers for LUP Type 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge<sup>8</sup> fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.
- b. LUP Type 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this General Permit.
- c. LUP Type 3 dischargers with direct discharges to surface waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:  
  
<http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif>  
<http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif>  
  
 Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.
- d. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

## **G. RECEIVING WATER LIMITATIONS**

1. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.
2. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.
3. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or

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<sup>8</sup> A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

## H. TRAINING QUALIFICATIONS

### 1. General

All persons responsible for implementing requirements of this General Permit shall be appropriately trained. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Persons responsible for preparing, amending and certifying SWPPPs shall comply with the requirements in this Section H.

### 2. SWPPP Certification Requirements

- a. **Qualified SWPPP Developer:** The LUP discharger shall ensure that all SWPPPs be written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
  - i A California registered professional civil engineer;
  - ii A California registered professional geologist or engineering geologist;
  - iii A California registered landscape architect;
  - iv A professional hydrologist registered through the American Institute of Hydrology;
  - v A certified professional in erosion and sediment control (CPESC)™ registered through Enviro Cert International, Inc;
  - vi A certified professional in storm water quality (CPSWQ)™ registered through Enviro Cert International, Inc.; or
  - vii A certified professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

- b. The LUP discharger shall ensure that the SWPPP is written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage.
- c. The LUP discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.
- d. **Qualified SWPPP Practitioner:** The LUP discharger shall ensure that all elements of any SWPPP for each project will be implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis, and for ensuring full compliance with the permit and implementation of all elements of the SWPPP. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:
  - i. A certified erosion, sediment and storm water inspector registered through Certified Professional in Erosion and Sediment Control, Inc.; or
  - ii. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

- e. The LUP discharger shall ensure that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner, and who is ultimately responsible for implementation of the SWPPP. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.
- f. The LUP discharger shall ensure that the SWPPP and each amendment be signed by the Qualified SWPPP Developer. The LUP discharger shall include a listing of the date of initial preparation and the dates of each amendment in the SWPPP.



## I. TYPES OF LINEAR PROJECTS

This attachment establishes three types (Type 1, 2 & 3) of complexity for areas within an LUP or project section based on threat to water quality. Project area Types are determined through Attachment A.1.

The Type 1 requirements below establish the baseline requirements for all LUPs subject to this General Permit. Additional requirements for Type 2 and Type 3 LUPs are labeled.

### 1. Type 1 LUPs:

LUP dischargers with areas of a LUP designated as Type 1 shall comply with the requirements in this Attachment. Type 1 LUPs are:

- a. Those construction areas where 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day; or
- b. Where greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:
  - i. Areas disturbed during construction will be returned to preconstruction conditions or equivalent protection is established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and
  - ii. Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization BMPs will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.
- c. Where the risk determination is as follows:
  - i. Low sediment risk, low receiving water risk, or
  - ii. Low sediment risk, medium receiving water risk, or
  - iii. Medium sediment risk, low receiving water risk

**2. Type 2 LUPs:**

Type 2 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 2 LUPs have the specified combination of risk:

- d. High sediment risk, low receiving water risk, or
- e. Medium sediment risk, medium receiving water risk, or
- f. Low sediment risk, high receiving water risk

Receiving water risk is either considered “Low” for those areas of the project that are not in close proximity to a sensitive receiving watershed, “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, and “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C of this General Permit.

**3. Type 3 LUPs:**

Type 3 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 3 LUPs have the specified combination of risk:

- a. High sediment risk, high receiving water risk, or
- b. High sediment risk, medium receiving water risk, or
- c. Medium sediment risk, high receiving water risk

Receiving water risk is either considered “Medium” for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, or “High” where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C.

**J. LUP TYPE-SPECIFIC REQUIREMENTS****1. Effluent Standards**

- a. Narrative – LUP dischargers shall comply with the narrative effluent standards below.

- i Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
  - ii LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
- b. Numeric – LUP Type 1 dischargers are not subject to a numeric effluent standard
  - c. Numeric –LUP Type 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.
  - d. Numeric – LUP Type 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

## **2. Good Site Management "Housekeeping"**

- a. LUP dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:
  - i Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - ii Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).
  - iii Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
  - iv Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).

- v Implement BMPs to control the off-site tracking of loose construction and landscape materials.
- b. LUP dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
  - i Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
  - ii Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
  - iii Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
  - iv Cover waste disposal containers at the end of every business day and during a rain event.
  - v Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
  - vi Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
  - vii Implement procedures that effectively address hazardous and non-hazardous spills.
  - viii Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
    - (1) Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and
    - (2) Appropriate spill response personnel are assigned and trained.
  - ix Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

- c. LUP dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
  - i Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.
  - ii Implement appropriate BMPs whenever equipment or vehicles are fueled, maintained or stored.
  - iii Clean leaks immediately and disposing of leaked materials properly.
- d. LUP dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
  - i Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
  - ii Contain fertilizers and other landscape materials when they are not actively being used.
  - iii Discontinue the application of any erodible landscape material at least 2 days before a forecasted rain event<sup>9</sup> or during periods of precipitation.
  - iv Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
  - v Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.
- e. LUP dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, LUP dischargers shall do the following:

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<sup>9</sup> 50% or greater chance of producing precipitation.

- i Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
  - ii Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
  - iii Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
  - iv Ensure retention of sampling, visual observation, and inspection records.
  - v Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
- f. LUP dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

### **3. Non-Storm Water Management**

- a. LUP dischargers shall implement measures to control all non-storm water discharges during construction.
- b. LUP dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
- c. LUP dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

### **4. Erosion Control**

- a. LUP dischargers shall implement effective wind erosion control.
- b. LUP dischargers shall provide effective soil cover for inactive<sup>10</sup> areas and all finished slopes, and utility backfill.

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<sup>10</sup> Areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days

- c. LUP dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

## 5. Sediment Controls

- a. LUP dischargers shall establish and maintain effective perimeter controls as needed, and implement effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
- b. On sites where sediment basins are to be used, LUP dischargers shall, at minimum, design sediment basins according to the guidance provided in CASQA's Construction BMP Handbook.
- c. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths<sup>11</sup> in accordance with Table 2 below.

**Table 2 – Critical Slope/Sheet Flow Length Combinations**

| <b>Slope Percentage</b> | <b>Sheet flow length not to exceed</b> |
|-------------------------|----------------------------------------|
| 0-25%                   | 20 feet                                |
| 25-50%                  | 15 feet                                |
| Over 50%                | 10 feet                                |

- d. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.
- e. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
- f. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall inspect all immediate access roads. At a minimum daily and prior to any rain event, the discharger shall remove any

<sup>11</sup> Sheet flow length is the length that shallow, low velocity flow travels across a site.

sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

- g. **Additional LUP Type 3 Requirement:** The Regional Water Board may require LUP Type 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

## 6. Run-on and Run-off Controls

- a. LUP dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this Attachment.
- b. Run-on and runoff controls are not required for Type 1 LUPs unless the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires such controls.

## 7. Inspection, Maintenance and Repair

- a. All inspection, maintenance repair and sampling activities at the discharger's LUP location shall be performed or supervised by a QSP representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
- b. LUP dischargers shall conduct visual inspections and observations daily during working hours (not recorded). At least once each 24-hour period during extended storm events, **LUP Type 2 & 3 dischargers** shall conduct visual inspections to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.
- c. Upon identifying failures or other shortcomings, as directed by the QSP, LUP dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
- d. For each pre- and post-rain event inspection required, LUP dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format that includes the information described below.



- e. The LUP discharger shall ensure that the checklist remains on-site or with the SWPPP. At a minimum, an inspection checklist should include:
  - i Inspection date and date the inspection report was written.
  - ii Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
  - iii Site information, including stage of construction, activities completed, and approximate area of the site exposed.
  - iv A description of any BMPs evaluated and any deficiencies noted.
  - v If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
  - vi Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
  - vii Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
  - viii Photographs taken during the inspection, if any.
  - ix Inspector's name, title, and signature.

**K. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS****1. Objectives**

SWPPPs for all LUPs shall be developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

- a. All pollutants and their sources, including sources of sediment, associated with construction activities associated with LUP activity are controlled;
- b. All non-storm water discharges are identified and either eliminated, controlled, or treated;
- c. BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from LUPs during construction; and
- d. Stabilization BMPs installed to reduce or eliminate pollutants after construction is completed are effective and maintained.

**2. SWPPP Implementation Schedule**

- a. LUPs for which PRDs have been submitted to the State Water Board shall develop a site/project location SWPPP prior to the start of land-disturbing activity in accordance with this Section and shall implement the SWPPP concurrently with commencement of soil-disturbing activities.
- b. For an ongoing LUP involving a change in the LRP, the new LRP shall review the existing SWPPP and amend it, if necessary, or develop a new SWPPP within 15 calendar days to conform to the requirements set forth in this General Permit.

**3. Availability**

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

**L. REGIONAL WATER BOARD AUTHORITIES**

1. Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing monitoring and sampling and analysis reports, conducting compliance inspections, gathering site information by any medium including sampling, photo and video documentation, and taking enforcement actions.
2. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.
3. Regional Water Boards may issue separate permits for discharges of storm water associated with construction activity to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a Regional Water Board, dischargers subject to those permits shall no longer be regulated by this General Permit.
4. Regional Water Boards may direct the discharger to reevaluate the LUP Type(s) for the project (or elements/areas of the project) and impose the appropriate level of requirements.
5. Regional Water Boards may terminate coverage under this General Permit for dischargers who negligently or with willful intent incorrectly determine or report their LUP Type (e.g., they determine themselves to be a LUP Type 1 when they are actually a Type 2).
6. Regional Water Boards may review PRDs and reject or accept applications for permit coverage or may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.
7. Regional Water Boards may impose additional requirements on dischargers to satisfy TMDL implementation requirements or to satisfy provisions in their Basin Plans.
8. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.
9. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

- 10.** Based on an LUP's threat to water quality and complexity, the Regional Water Board may determine on a case-by-case basis that an LUP, or a portion of an LUP, is not eligible for the linear project requirements contained in this Attachment, and require that the discharger comply with all standard requirements in this General Permit.
- 11.** The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

## M. MONITORING AND REPORTING REQUIREMENTS

**Table 3. LUP Summary of Monitoring Requirements**

| LUP Type | Visual Inspections |                 |                 |            | Sample Collection     |                 |                               |
|----------|--------------------|-----------------|-----------------|------------|-----------------------|-----------------|-------------------------------|
|          | Daily Site BMP     | Pre-storm Event | Daily Storm BMP | Post Storm | Storm Water Discharge | Receiving Water | Non-Visible (when applicable) |
|          |                    | Baseline        |                 |            |                       |                 |                               |
| 1        | X                  |                 |                 |            |                       |                 | X                             |
| 2        | X                  | X               | X               | X          | X                     |                 | X                             |
| 3        | X                  | X               | X               | X          | X                     | X               | X                             |

### 1. Objectives

LUP dischargers shall prepare a monitoring and reporting program (M&RP) prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The M&RP must be a part of the SWPPP, included as an appendix or separate SWPPP chapter.

### 2. M&RP Implementation Schedule

- a. LUP dischargers shall implement the requirements of this Section at the time of commencement of construction activity. LUP dischargers are responsible for implementing these requirements until construction activity is complete and the site is stabilized.
- b. LUP dischargers shall revise the M&RP when:
  - i. Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements and intent of this General Permit.
  - ii. The Regional Water Board requires the discharger to revise its M&RP based on its review of the document. Revisions may include, but not be limited to, conducting additional site inspections, submitting reports, and certifications. Revisions shall be submitted via postal mail or electronic e-mail.

- iii The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

### **3. LUP Type 1 Monitoring and Reporting Requirements**

#### **a. LUP Type 1 Inspection Requirements**

- i LUP Type 1 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.
- ii LUP Type 1 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.
- iii LUP Type 1 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.
- iv LUP Type 1 dischargers shall conduct daily visual inspections to verify that:
  - (1) Appropriate BMPs for storm water and non-storm water are being implemented in areas where active construction is occurring (including staging areas);
  - (2) Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day;
  - (3) Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.
- v Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures

are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

- vi Inspection programs are required for LUP Type 1 projects where temporary and permanent stabilization BMPs are installed and are to be monitored after active construction is completed. Inspection activities shall continue until adequate permanent stabilization is established and, in areas where re-vegetation is chosen, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

b. LUP Type 1 Monitoring Requirements for Non-Visible Pollutants

LUP Type 1 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

- i Sampling and analysis for non-visible pollutants is only required where the LUP Type 1 discharger believes pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.
  - (1) Visual observations made during the monitoring program described above will help the LUP Type 1 discharger determine when to collect samples.
  - (2) The LUP Type 1 discharger is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.
- ii LUP Type 1 dischargers shall collect samples down-gradient from all discharge locations where the visual observations were made triggering the monitoring, and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.
- iii If sampling for non-visible pollutant parameters is required, LUP Type 1 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

- iv LUP Type 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
  - v LUP Type 1 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample<sup>12</sup>) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.
  - vi LUP Type 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).
  - vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 1 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification.
  - viii LUP Type 1 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.
- c. LUP Type 1 Visual Observation Exceptions
- i LUP Type 1 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. The Type 1 LUP discharger is not required to physically collect samples or conduct visual observation (inspections) under the following conditions:
    - (1) During dangerous weather conditions such as flooding and electrical storms;
    - (2) Outside of scheduled site business hours.
    - (3) When access to the site is unsafe due to storm events.

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<sup>12</sup> Sample collected at a location unaffected by construction activities.



- ii If the LUP Type 1 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

d. Particle Size Analysis for Risk Justification

LUP Type 1 dischargers utilizing justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

#### **4. LUP Type 2 & 3 Monitoring and Reporting Requirements**

a. LUP Type 2 & 3 Inspection Requirements

- i LUP Type 2 & 3 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.
- ii LUP Type 2 & 3 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.
- iii LUP Type 2 & 3 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.
- iv LUP Type 2 & 3 dischargers shall conduct daily visual inspections to verify that appropriate BMPs for storm water and non-storm water are being implemented and in place in areas where active construction is occurring (including staging areas).
- v LUP Type 2 & 3 dischargers shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that BMPs have functioned adequately. During

extended storm events, inspections shall be required during normal working hours for each 24-hour period.

- vi Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).
- vii LUP Type 2 & 3 dischargers shall implement a monitoring program for inspecting projects that require temporary and permanent stabilization BMPs after active construction is complete. Inspections shall ensure that the BMPs are adequate and maintained. Inspection activities shall continue until adequate permanent stabilization is established and, in vegetated areas, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.
- viii If possible, LUP Type 2 & 3 dischargers shall install a rain gauge on-site at an accessible and secure location with readings made during all storm event inspections. When readings are unavailable, data from the closest rain gauge with publically available data may be used.
- ix LUP Type 2 & 3 dischargers shall Include and maintain a log of the inspections conducted in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection.

b. LUP Type 2 & 3 Storm Water Effluent Monitoring Requirements

**Table 4. LUP Type 2 & 3 Effluent Monitoring Requirements**

| <b>LUP Type</b> | <b>Frequency</b>                                                                                                                            | <b>Effluent Monitoring</b>                                          |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>2</b>        | Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction. | Turbidity, pH, and non-visible pollutant parameters (if applicable) |
| <b>3</b>        | Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction. | turbidity, pH, and non-visible pollutant parameters (if applicable) |

- i LUP Type 2 & 3 dischargers shall collect storm water grab samples from sampling locations characterizing discharges associated with activity from the LUP active areas of construction. At a minimum, 3 samples shall be collected per day of discharge.

- ii LUP Type 2 & 3 dischargers shall collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.
- iii LUP Type 2 & 3 dischargers shall ensure that storm water grab sample(s) obtained be representative of the flow and characteristics of the discharge.
- iv LUP Type 2 & 3 dischargers shall analyze their effluent samples for:
  - (1) pH and turbidity
  - (2) Any additional parameter for which monitoring is required by the Regional Water Board.

c. LUP Type 2 & 3 Storm Water Effluent Sampling Locations

- i LUP Type 2 & 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire disturbed project or area.
- ii LUP Type 2 & 3 dischargers may monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of NALs.
- iii LUP Type 2 & 3 dischargers shall select analytical test methods from the list provided in Table 5 below.
- iv LUP Type 2 & 3 dischargers shall ensure that all storm water sample collection preservation and handling shall be conducted in accordance with the “Storm Water Sample Collection and Handling Instructions” below.

d. LUP Type 3 Receiving Water Monitoring Requirements

- i In the event that an LUP Type 3 discharger’s effluent exceeds the receiving water monitoring triggers of 500 NTU turbidity or pH range of 6.0-9.0, contained in this General Permit and has a direct discharge to receiving waters, the LUP discharger shall subsequently sample Receiving Waters (RWs) for turbidity, pH (if applicable) and SSC for the duration of coverage under this General Permit. In the event that an LUP Tupe 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall

subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

- ii LUP Type 3 dischargers that meet the project criteria in Appendix 3 of this General Permit and have more than 30 acres of soil disturbance in the project area or project section area designated as Type 3, shall comply with the Bioassessment requirements prior to commencement of construction activity.
- iii LUP Type 3 dischargers shall obtain RW samples in accordance with the requirements of the Receiving Water Sampling Locations section (Section M.4.c. of this Attachment).

e. LUP Type 3 Receiving Water Sampling Locations

- i **Upstream/up-gradient RW samples:** LUP Type 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible to and upstream from the effluent discharge point.
- ii **Downstream/down-gradient RW samples:** LUP Type 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible to and downstream from the effluent discharge point.
- iii If two or more discharge locations discharge to the same receiving water, LUP Type 3 dischargers may sample the receiving water at a single upstream and downstream location.

f. LUP Type 2 & 3 Monitoring Requirements for Non-Visible Pollutants

LUP Type 2 & 3 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

- i Sampling and analysis for non-visible pollutants is only required where LUP Type 2 & 3 dischargers believe pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

- (1) Visual observations made during the monitoring program described above will help LUP Type 2 & 3 dischargers determine when to collect samples.
  - (2) LUP Type 2 & 3 dischargers are not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.
- ii LUP Type 2 & 3 dischargers shall collect samples down-gradient from the discharge locations where the visual observations were made triggering the monitoring and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.
  - iii If sampling for non-visible pollutant parameters is required, LUP Type 2 & 3 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.
  - iv LUP Type 2 & 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
  - v LUP Type 2 & 3 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample<sup>13</sup>) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.
  - vi LUP Type 2 & 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).
  - vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 2 & 3 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed.

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<sup>13</sup> Sample collected at a location unaffected by construction activities

Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 2 & 3 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

g. LUP Type 2 & 3 Visual Observation and Sample Collection Exceptions

i LUP Type 2 & 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. Type 2 & 3 LUP dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

ii If the LUP Type 2 or 3 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

h. LUP Type 2 & 3 Storm Water Sample Collection and Handling Instructions

LUP Type 2 & 3 dischargers shall refer to Table 5 below for test Methods, detection Limits, and reporting Units. During storm water sample collection and handling, the LUP Type 2 & 3 discharger shall:

i Identify the parameters required for testing and the number of storm water discharge points that will be sampled. Request the laboratory to provide the appropriate number of sample containers, types of containers, sample container labels, blank chain of custody forms, and sample preservation instructions.

ii Determine how to ship the samples to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

- iii Use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers could contaminate your samples.
- iv Prevent sample contamination, by not touching, or putting anything into the sample containers before collecting storm water samples.
- v Not overfilling sample containers. Overfilling can change the analytical results.
- vi Tightly screw the cap of each sample container without stripping the threads of the cap.
- vii Complete and attach a label to each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.
- viii Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into the shipping container. Samples should be kept as close to 4° C (39° F) as possible until arriving at the laboratory. Do not freeze samples.
- ix Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.
- x Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.
- xi Designate and train personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.
- xii Refer to the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP) for more

information on sampling collection and analysis. See  
[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/)<sup>14</sup>

**Table 5. Test Methods, Detection Limits, Reporting Units and Applicable NALs**

| Parameter            | Test Method                                                           | Discharge Type                                           | Min. Detection Limit | Reporting Units | Numeric Action Levels      | (LUP Type 3) Receiving Water Monitoring Trigger |
|----------------------|-----------------------------------------------------------------------|----------------------------------------------------------|----------------------|-----------------|----------------------------|-------------------------------------------------|
| <b>pH</b>            | Field test with calibrated portable instrument                        | Type 2 & 3                                               | 0.2                  | pH units        | Lower = 6.5<br>upper = 8.5 | Lower = 6.0<br>upper = 9.0                      |
| <b>Turbidity</b>     | EPA 0180.1 and/or field test with calibrated portable instrument      | Type 2 & 3                                               | 1                    | NTU             | 250 NTU                    | 500 NTU                                         |
| <b>SSC</b>           | ASTM Method D 3977-97 <sup>15</sup>                                   | Type 3 if Receiving Water Monitoring Trigger is exceeded | 5                    | Mg/L            | N/A                        | N/A                                             |
| <b>Bioassessment</b> | (STE) Level I of (SAFIT), <sup>16</sup> fixed-count of 600 org/sample | Type 3 LUPs > 30 acres                                   | N/A                  | N/A             | N/A                        | N/A                                             |

i. LUP Type 2 & 3 Monitoring Methods

- i The LUP Type 2 or 3 discharger's project M&RP shall include a description of the following items:

- (1) Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

<sup>14</sup> Additional information regarding SWAMP's QAPrP can be found at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/).

<sup>15</sup> ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394

<sup>16</sup> The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: [http://www.swrcb.ca.gov/swamp/docs/safit/ste\\_list.pdf](http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf). When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.



- (2) Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program a copy of the Chain of Custody form used when handling and shipping samples.
- (3) Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section M.4.f above.
- ii LUP Type 2 & 3 dischargers shall ensure that all sampling and sample preservation be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses shall be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). The LUP discharger shall conduct its own field analysis of pH and may conduct its own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.
- j. LUP Type 2 & 3 Analytical Methods

LUP Type 2 & 3 dischargers shall refer to Table 5 above for test Methods, detection Limits, and reporting Units.

- i **pH:** LUP Type 2 & 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or pH test kit. The LUP discharger shall record pH monitoring results on paper and retain these records in accordance with Section M.4.o, below.
- ii **Turbidity:** LUP Type 2 & 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results shall

be recorded in the site log book in Nephelometric Turbidity Units (NTU).

- iii **Suspended sediment concentration (SSC):** LUP Type 3 dischargers exceeding the turbidity Receiving Water Monitoring Trigger, shall perform SSC analysis using ASTM Method D3977-97.
- iv **Bioassessment:** LUP Type 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

k. Watershed Monitoring Option

If an LUP Type 2 or 3 discharger is part of a qualified regional watershed-based monitoring program the LUP Type 2 or 3 discharger may be eligible for relief from the monitoring requirements in this Attachment. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program if it determines that the watershed-based monitoring program will provide information to determine each discharger's compliance with the requirements of this General Permit.

l. Particle Size Analysis for Risk Justification

LUP Type 2 & 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

m. NAL Exceedance Report

- i In the event that any effluent sample exceeds an applicable NAL, the Regional Water Boards may require LUP Type 2 & 3 dischargers to submit NAL Exceedance Reports.
- ii LUP Type 2 & 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.
- iii LUP Type 2 & 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the exceedance report is filed.
- iv LUP Type 2 & 3 dischargers shall include in the NAL Exceedance Report:

- (1) the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”); and
- (2) the date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
- (3) Description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

n. Monitoring Records

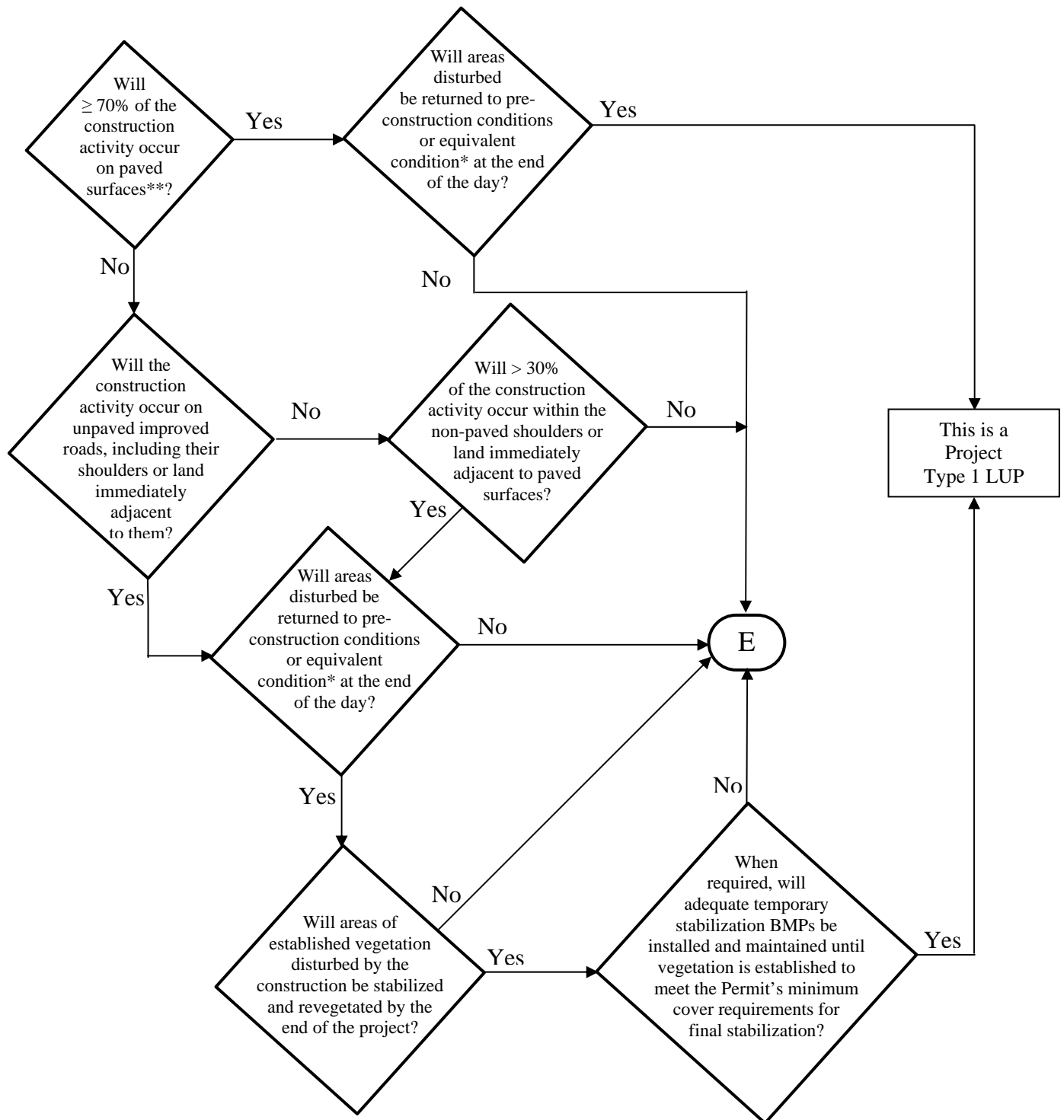
LUP Type 2 & 3 dischargers shall ensure that records of all storm water monitoring information and copies of all reports (including Annual Reports) required by this General Permit be retained for a period of at least three years. LUP Type 2 & 3 dischargers may retain records off-site and make them available upon request. These records shall include:

- i The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge);
- ii The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;
- iii The date and approximate time of analyses;
- iv The individual(s) who performed the analyses;
- v A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and all chain of custody forms;
- vi Quality assurance/quality control records and results;
- vii Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Section M.4.a above);
- viii Visual observation and sample collection exception records (see Section M.4.g above); and

- ix The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

## ATTACHMENT A.1

### LUP Project Area or Project Section Area Type Determination

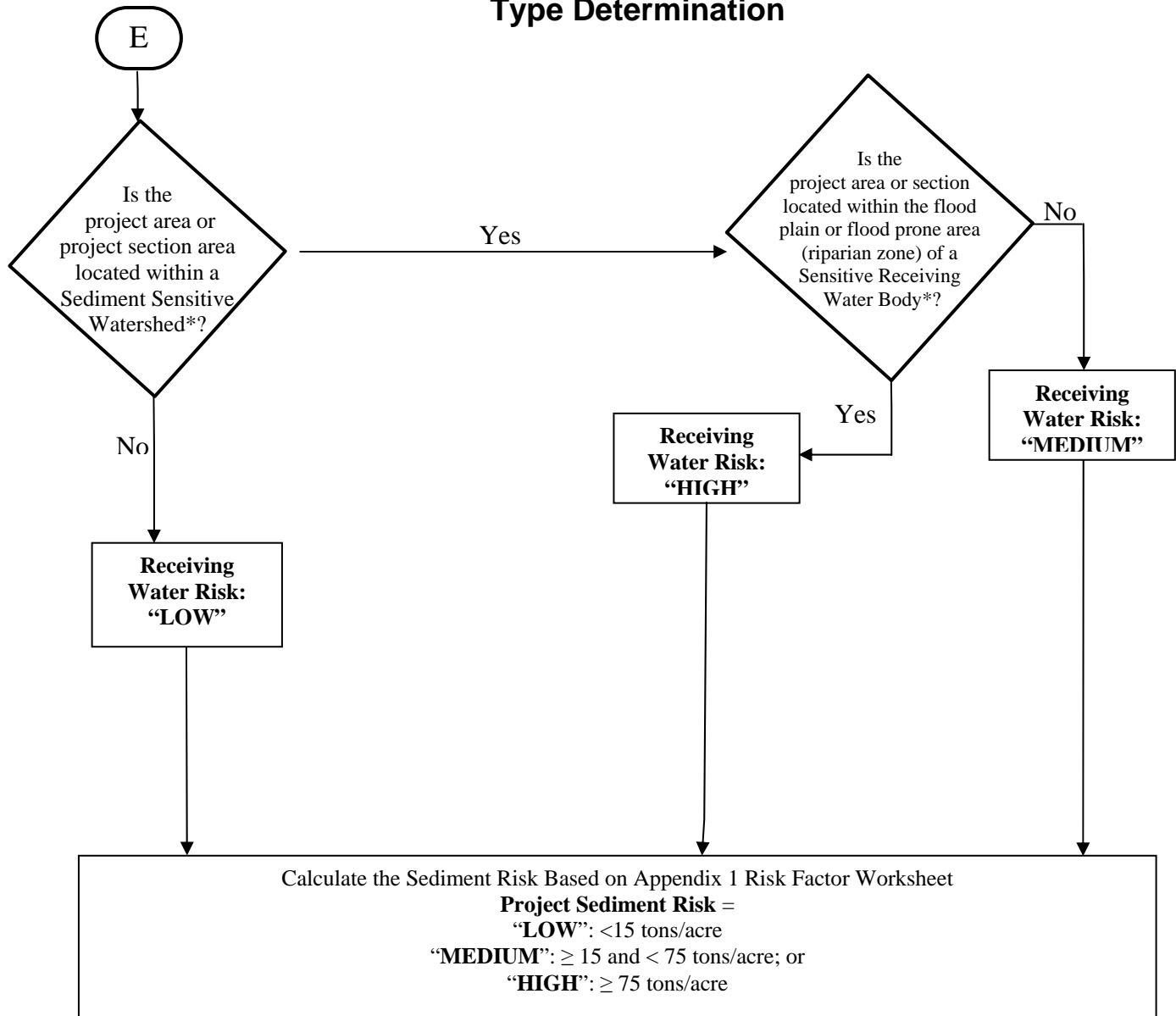


\*See Definition of Terms

\*\* Or: "Will < 30% of the soil disturbance occur on unpaved surfaces?"

## ATTACHMENT A.1

### LUP Project Area or Project Section Area Type Determination



\* See Definition of Terms

| <b><u>PROJECT SEDIMENT RISK</u></b>    |            |               |             |
|----------------------------------------|------------|---------------|-------------|
| <b><u>RECEIVING<br/>WATER RISK</u></b> | <b>LOW</b> | <b>MEDIUM</b> | <b>HIGH</b> |
|                                        | Type 1     | Type 1        | Type 2      |
|                                        | Type 1     | Type 2        | Type 3      |
| <b>HIGH</b>                            | Type 2     | Type 3        | Type 3      |

## ATTACHMENT A.1

### Definition of Terms

1. **Equivalent Condition** – Means disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.
2. **Linear Construction Activity** – Linear construction activity consists of underground/ overhead facilities that typically include, but are not limited to, any conveyance, pipe or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/ tower pad and cable/ wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/ borrow locations.
3. **Sediment Sensitive Receiving Water Body** – Defined as a water body segment that is listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or is designated with beneficial uses of SPAWN, MIGRATORY, and COLD.
4. **Sediment Sensitive Watershed** – Defined as a watershed draining into a receiving water body listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or a water body designated with beneficial uses of SPAWN, MIGRATORY, and COLD.

**ATTACHMENT A.2  
PERMIT REGISTRATION DOCUMENTS (PRDs)  
GENERAL INSTRUCTIONS FOR LINEAR UNDERGROUND/OVERHEAD PROJECTS TO  
COMPLY WITH THE CONSTRUCTION GENERAL PERMIT**

**GENERAL INSTRUCTIONS**

**Who Must Submit**

This permit is effective on July 1, 2010.

The Legally Responsible Person (LRP) for construction activities associated with linear underground/overhead project (LUP) must electronically apply for coverage under this General Permit on or after July 1, 2010. If it is determined that the LUP construction activities require an NPDES permit, the Legally Responsible Person<sup>1</sup> (LRP) shall submit PRDs for this General Permit in accordance with the following:

*LUPs associated with Private or Municipal Development Projects*

1. For LUPs associated with pre-development and pre-redevelopment construction activities:

The LRP must obtain coverage<sup>2</sup> under this General Permit for its pre-development and pre-redevelopment construction activities where the total disturbed land area of these construction activities is greater than 1 acre.

2. For LUPs associated with new development and redevelopment construction projects:

The LRP must obtain coverage under this General Permit for LUP construction activities associated with new development and redevelopment projects where the total disturbed land area of the LUP is greater than 1 acre. Coverage under this permit is not required where the same LUP construction activities are covered by another NPDES permit.

*LUPs not associated with private or municipal new development or redevelopment projects:*

The LRP must obtain coverage under this General Permit on or after July 1, 2010 for its LUP construction activities where the total disturbed land area is greater than 1 acre.

**PRD Submittal Requirements**

Prior to the start of construction activities a LRP must submit PRDs and fees to the State Water Board for each LUP.

*New and Ongoing LUPs*

Dischargers of new LUPs that commence construction activities after the adoption date of this General Permit shall file PRDs prior to the commencement of construction and implement the SWPPP upon the start of construction.

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<sup>1</sup> person possessing the title of the land on which the construction activities will occur for the regulated site

<sup>2</sup> obtain coverage means filing PRDs for the project.



## **PERMIT REGISTRATION DOCUMENTS (PRDs) GENERAL INSTRUCTIONS (CONTINUED)**

Dischargers of ongoing LUPs that are currently covered under State Water Board Order No. 2003-0007 (Small LUP General Permit) shall electronically file Permit Registration Documents no later than July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 2003-0007-DWQ will be terminated. All existing dischargers shall be exempt from the risk determination requirements in Attachment A. All existing dischargers are therefore subject to LUP Type 1 requirements regardless of their project's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the risk determination requirements in Attachment A.

### Where to Apply

The Permit Registration Documents (PRDs) can be found at [www.waterboards.ca.gov/water\\_issues/programs/stormwater/](http://www.waterboards.ca.gov/water_issues/programs/stormwater/)

### Fees

The annual fee for storm water permits are established through the State of California Code of Regulations.

### When Permit Coverage Commences

To obtain coverage under the General Permit, the LRP must include the complete PRDs and the annual fee. All PRDs deemed incomplete will be rejected with an explanation as to what is required to complete submittal. Upon receipt of complete PRDs and associated fee, each discharger will be sent a waste discharger's identification (WDID) number.

### **Projects and Activities Not Defined As Construction Activity**

1. LUP construction activity does not include routine maintenance projects to maintain original line and grade, hydraulic capacity, or original purpose of the facility. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:
  - Maintain the original purpose of the facility, or hydraulic capacity.
  - Update existing lines<sup>3</sup> and facilities to comply with applicable codes, standards and regulations regardless if such projects result in increased capacity.
  - Repairing leaks.

Routine maintenance does not include construction of new<sup>4</sup> lines or facilities resulting from compliance with applicable codes, standards and regulations.

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<sup>3</sup> Update existing lines includes replacing existing lines with new materials or pipes.

<sup>4</sup> New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

## PERMIT REGISTRATION DOCUMENTS (PRDs) GENERAL INSTRUCTIONS (CONTINUED)

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must acquire new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

2. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).
3. Tie-ins conducted immediately adjacent to “energized” or “pressurized” facilities by the discharger are not considered small construction activities where all other LUP construction activities associated with the tie-in are covered by a NOI and SWPPP of a third party or municipal agency.

### **Calculating Land Disturbance Areas of LUPs**

The total land area disturbed for LUPs is the sum of the:

- Surface areas of trenches, laterals and ancillary facilities, plus
- Area of the base of stockpiles on unpaved surfaces, plus
- Surface area of the borrow area, plus
- Areas of paved surfaces constructed for the project, plus
- Areas of new roads constructed or areas of major reconstruction to existing roads (e.g. improvements to two-track surfaces or road widening) for the sole purpose of accessing construction activities or as part of the final project, plus
- Equipment and material storage, staging, and preparation areas (laydown areas) not on paved surfaces, plus
- Soil areas outside the surface area of trenches, laterals and ancillary facilities that will be graded, and/or disturbed by the use of construction equipment, vehicles and machinery during construction activities.

### *Stockpiling Areas*

Stockpiling areas, borrow areas and the removal of soils from a construction site may or may not be included when calculating the area of disturbed soil for a site depending on the following conditions:

- For stockpiling of soils onsite or immediately adjacent to a LUP site and the stockpile is not on a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation.
- The surface area of borrow areas that are onsite or immediately adjacent to a project site are to be included in the disturbed area calculation.
- For soil that is hauled offsite to a location owned or operated by the discharger that is not a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

**PERMIT REGISTRATION DOCUMENTS (PRDs)  
GENERAL INSTRUCTIONS (CONTINUED)**

- For soil that is brought to the project from an off-site location owned or operated by the discharger the surface area of the borrow pit is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.
- Trench spoils on a paved surface that are either returned to the trench or excavation or hauled away from the project daily for disposal or reuse will not be included in the disturbed area calculation.

If you have any questions concerning submittal of PRDs, please call the State Water Board at (866) 563-3107.

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**ATTACHMENT B  
PERMIT REGISTRATION DOCUMENTS (PRDs) TO COMPLY WITH THE TERMS  
OF THE GENERAL PERMIT TO DISCHARGE STORM WATER  
ASSOCIATED WITH CONSTRUCTION ACTIVITY**

**GENERAL INSTRUCTIONS**

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- A.** All Linear Construction Projects shall comply with the PRD requirements in Attachment A.2 of this Order.

**B. Who Must Submit**

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Storm Water Permit (General Permit). Any construction activity that is a part of a larger common plan of development or sale must also be permitted, regardless of size. (For example, if 0.5 acre of a 20-acre subdivision is disturbed by the construction activities of discharger A and the remaining 19.5 acres is to be developed by discharger B, discharger A must obtain a General Storm Water Permit for the 0.5 acre project).

Other discharges from construction activities that are covered under this General Permit can be found in the General Permit Section II.B.

It is the LRP's responsibility to obtain coverage under this General Permit by electronically submitting complete PRDs (Permit Registration Documents).

In all cases, the proper procedures for submitting the PRDs must be completed before construction can commence.

**C. Construction Activity Not Covered By This General Permit**

Discharges from construction that are not covered under this General Permit can be found in the General Permit Sections II.A & B..

**D. Annual Fees and Fee Calculation**

Annual fees are calculated based upon the total area of land to be disturbed not the total size of the acreage owned. However, the calculation includes all acres to be disturbed during the duration of the project. For example, if 10 acres are scheduled to be disturbed the first year and 10 in each subsequent year for 5 years, the annual fees would be based upon 50 acres of disturbance. The State Water Board will evaluate adding acreage to an existing Permit Waste Discharge Identification (WDID) number on a case-by-case basis. In general, any acreage to be considered must be contiguous to the permitted land area and the existing

SWPPP must be appropriate for the construction activity and topography of the acreage under consideration. As acreage is built out and stabilized or sold, the Change of Information (COI) form enables the applicant to remove those acres from inclusion in the annual fee calculation. Checks should be made payable to: State Water Board.

The Annual fees are established through regulations adopted by the State Water Board. The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI, based on the total acreage to be disturbed during the life of the project. Annual fees are subject to change by regulation.

Dischargers that apply for and satisfy the Small Construction Erosivity Wavier requirements shall pay a fee of \$200.00 plus an applicable surcharge, see the General Permit Section II.B.7.

#### **E. When to Apply**

LRP's proposing to conduct construction activities subject to this General Permit must submit their PRDs prior to the commencement of construction activity.

#### **F. Requirements for Completing Permit Registration Documents (PRDs)**

All dischargers required to comply with this General Permit shall electronically submit the required PRDs for their type of construction as defined below.

#### **G. Standard PRD Requirements (All Dischargers)**

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee
6. Certification

#### **H. Additional PRD Requirements Related to Construction Type**

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
  - a. Post-Construction Water Balance Calculator (Appendix 2).
2. Dischargers who are proposing to implement ATS shall submit:
  - a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.

- b. Certification proof that design done by a professional in accordance with Attachment F.
- 3. Dischargers who are proposing an alternate Risk Justification:
  - a. Particle Size Analysis.

#### **I. Exceptions to Standard PRD Requirements**

Construction sites with an R value less than 5 as determined in the Risk Assessment are not required to submit a SWPPP.

#### **J. Description of PRDs**

- 1. Notice of Intent (NOI)
- 2. Site Map(s) Includes:
  - a. The project's surrounding area (vicinity)
  - b. Site layout
  - c. Construction site boundaries
  - d. Drainage areas
  - e. Discharge locations
  - f. Sampling locations
  - g. Areas of soil disturbance (temporary or permanent)
  - h. Active areas of soil disturbance (cut or fill)
  - i. Locations of all runoff BMPs
  - j. Locations of all erosion control BMPs
  - k. Locations of all sediment control BMPs
  - l. ATS location (if applicable)
  - m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
  - n. Locations of all post-construction BMPs
  - o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices
- 3. **SWPPPs**  
A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.
- 4. **Risk Assessment**  
All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1.
  - a. The Standard Risk Assessment includes utilization of the following:
    - i. Receiving water Risk Assessment interactive map

- ii. EPA Rainfall Erosivity Factor Calculator Website
  - iii. Sediment Risk interactive map
  - iv. Sediment sensitive water bodies list
- b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator
5. **Post-Construction Water Balance Calculator**  
All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.
6. **ATS Design Document and Certification**  
All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (See Attachment F).

To obtain coverage under the General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

Questions?

If you have any questions on completing the PRDs please email [stormwater@waterboards.ca.gov](mailto:stormwater@waterboards.ca.gov) or call (866) 563-3107.



## **ATTACHMENT C RISK LEVEL 1 REQUIREMENTS**

### **A. Effluent Standards**

*[These requirements are the same as those in the General Permit order.]*

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:
  - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
  - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

### **B. Good Site Management "Housekeeping"**

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:
  - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
  - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
  - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
  - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
  - d. Cover waste disposal containers at the end of every business day and during a rain event.
  - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
  - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
  - g. Implement procedures that effectively address hazardous and non-hazardous spills.
  - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
    - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

- ii. Appropriate spill response personnel are assigned and trained.
  - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
- a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
  - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
  - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
- a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
  - b. Contain fertilizers and other landscape materials when they are not actively being used.
  - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
  - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
  - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
  - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
  - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
  - d. Ensure retention of sampling, visual observation, and inspection records.
  - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

### **C. Non-Storm Water Management**

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

**D. Erosion Control**

1. Risk Level 1 dischargers shall implement effective wind erosion control.
2. Risk Level 1 dischargers shall provide effective soil cover for inactive<sup>1</sup> areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

**E. Sediment Controls**

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

**F. Run-on and Runoff Controls**

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

**G. Inspection, Maintenance and Repair**

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

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<sup>1</sup> Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
  - a. Inspection date and date the inspection report was written.
  - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
  - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
  - d. A description of any BMPs evaluated and any deficiencies noted.
  - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
  - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
  - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
  - h. Photographs taken during the inspection, if any.
  - i. Inspector's name, title, and signature.

**H. Rain Event Action Plan**

Not required for Risk Level 1 dischargers.

## I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

| Risk Level | Visual Inspections                  |                 |      |                 |            | Sample Collection     |                 |
|------------|-------------------------------------|-----------------|------|-----------------|------------|-----------------------|-----------------|
|            | Quarterly Non-storm Water Discharge | Pre-storm Event |      | Daily Storm BMP | Post Storm | Storm Water Discharge | Receiving Water |
|            |                                     | Baseline        | REAP |                 |            |                       |                 |
| 1          | X                                   | X               |      | X               | X          |                       |                 |

### 1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

### 2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions;



- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
- c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
- d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

**3. Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

- a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
- b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
- c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.
- d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
- e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):
  - i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
  - ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

- iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

#### **4. Risk Level 1 – Visual Observation Exemptions**

- a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:
  - i. During dangerous weather conditions such as flooding and electrical storms.
  - ii. Outside of scheduled site business hours.
- b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

#### **5. Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

#### **6. Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

- i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
- ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
- iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

**7. Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

- a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

- f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.<sup>2</sup>
- h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

#### **8. Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

#### **9. Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.

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<sup>2</sup> For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).
- i. Visual observation and sample collection exception records (see Section I.4 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

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## **ATTACHMENT D RISK LEVEL 2 REQUIREMENTS**

### **A. Effluent Standards**

*[These requirements are the same as those in the General Permit order.]*

1. Narrative – Risk Level 2 dischargers shall comply with the narrative effluent standards listed below:
  - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
  - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk level 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

### **B. Good Site Management "Housekeeping"**

1. Risk Level 2 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 2 dischargers shall implement the following good housekeeping measures:
  - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
  - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 2 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
  - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
  - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
  - d. Cover waste disposal containers at the end of every business day and during a rain event.
  - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
  - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
  - g. Implement procedures that effectively address hazardous and non-hazardous spills.
  - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require:
    - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.



- ii. Appropriate spill response personnel are assigned and trained.
  - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 2 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
- a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
  - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
  - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 2 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
- a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
  - b. Contain all fertilizers and other landscape materials when they are not actively being used.
  - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
  - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
  - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 2 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 2 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
  - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
  - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
  - d. Ensure retention of sampling, visual observation, and inspection records.
  - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 2 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.
  7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

### C. Non-Storm Water Management

1. Risk Level 2 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 2 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 2 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

#### **D. Erosion Control**

1. Risk Level 2 dischargers shall implement effective wind erosion control.
2. Risk Level 2 dischargers shall provide effective soil cover for inactive<sup>1</sup> areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 2 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

#### **E. Sediment Controls**

1. Risk Level 2 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 2 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.
3. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active<sup>2</sup> construction.
4. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths<sup>3</sup> in accordance with Table 1.

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<sup>1</sup> Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

<sup>2</sup> Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage.

<sup>3</sup> Sheet flow length is the length that shallow, low velocity flow travels across a site.

**Table 1 - Critical Slope/Sheet Flow Length Combinations**

| <b>Slope Percentage</b> | <b>Sheet flow length not to exceed</b> |
|-------------------------|----------------------------------------|
| 0-25%                   | 20 feet                                |
| 25-50%                  | 15 feet                                |
| Over 50%                | 10 feet                                |

5. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.
6. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

#### **F. Run-on and Run-off Controls**

Risk Level 2 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

#### **G. Inspection, Maintenance and Repair**

1. Risk Level 2 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).
2. Risk Level 2 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 2 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 2 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 2 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
  - a. Inspection date and date the inspection report was written.
  - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
  - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
  - d. A description of any BMPs evaluated and any deficiencies noted.
  - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
  - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
  - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
  - h. Photographs taken during the inspection, if any.
  - i. Inspector's name, title, and signature.

#### **H. Rain Event Action Plan**

1. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any

likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

2. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).
3. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:
  - a. Site Address
  - b. Calculated Risk Level (2 or 3)
  - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number
  - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
  - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
4. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP include in the REAP, at a minimum, the following project phase information:
  - a. Activities associated with each construction phase
  - b. Trades active on the construction site during each construction phase
  - c. Trade contractor information
  - d. Suggested actions for each project phase
5. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:
  - a. Site Address
  - b. Calculated Risk Level (2 or 3)
  - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number

- d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
  - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
  - f. Trades active on site during Inactive Construction
  - g. Trade contractor information
  - h. Suggested actions for inactive construction sites
6. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.
7. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

## I. Risk Level 2 Monitoring and Reporting Requirements

**Table 2- Summary of Monitoring Requirements**

| Risk Level | Visual Inspections                  |                 |          |                 |            | Sample Collection     |                 |
|------------|-------------------------------------|-----------------|----------|-----------------|------------|-----------------------|-----------------|
|            | Quarterly Non-storm Water Discharge | Pre-storm Event |          | Daily Storm BMP | Post Storm | Storm Water Discharge | Receiving Water |
|            |                                     | Baseline        | REAP     |                 |            |                       |                 |
| <b>2</b>   | <b>X</b>                            | <b>X</b>        | <b>X</b> | <b>X</b>        | <b>X</b>   | <b>X</b>              |                 |

### 1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

### 2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs).



- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.
- c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.
- d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

### **3. Risk Level 2 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

- a. Risk Level 2 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
- b. Risk Level 2 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
- c. Risk Level 2 dischargers shall conduct visual observations (inspections) during business hours only.
- d. Risk Level 2 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
- e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 2 dischargers shall visually observe (inspect):
  - i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
  - ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

- iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in c.i and c.iii above, Risk Level 2 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 2 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 2 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

#### **4. Risk Level 2 – Water Quality Sampling and Analysis**

- a. Risk Level 2 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.
- b. At minimum, Risk Level 2 dischargers shall collect 3 samples per day of the qualifying event.
- c. Risk Level 2 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

#### **Storm Water Effluent Monitoring Requirements**

- d. Risk Level 2 dischargers shall analyze their effluent samples for:
  - i. pH and turbidity.
  - ii. Any additional parameters for which monitoring is required by the Regional Water Board.

## 5. Risk Level 2 – Storm Water Discharge Water Quality Sampling Locations

### Effluent Sampling Locations

- a. Risk Level 2 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.
- b. Risk Level 2 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.
- c. Risk Level 2 dischargers shall ensure that storm water discharge collected and observed represent<sup>4</sup> the effluent in each drainage area based on visual observation of the water and upstream conditions.
- d. Risk Level 2 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.
- e. Risk Level 2 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
- f. Risk Level 2 dischargers shall select analytical test methods from the list provided in Table 3 below.
- g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 “Storm Water Sample Collection and Handling Instructions” below.

## 6. Risk Level 2 – Visual Observation and Sample Collection Exemptions

- a. Risk Level 2 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 2 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

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<sup>4</sup> For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment-laden water even if most water flowing through the fence is clear.

- i. During dangerous weather conditions such as flooding and electrical storms.
    - ii. Outside of scheduled site business hours.
  - b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 2 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.
- 7. Risk Level 2 – Storm Water Sample Collection and Handling Instructions**
- a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
  - b. Risk Level 2 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.
  - c. Risk Level 2 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).<sup>5</sup>
- 8. Risk Level 2 – Monitoring Methods**
- a. Risk Level 2 dischargers shall include a description of the following items in the CSMP:
    - i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.
    - ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program

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<sup>5</sup> Additional information regarding SWAMP's QAPrP can be found at [http://www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/).  
 QAPrP: [http://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/qapp/swamp\\_qapp\\_master090108a.pdf](http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf).

an example Chain of Custody form used when handling and shipping samples.

- iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.
- b. Risk Level 2 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 2 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services. Risk Level 2 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

## 9. Risk Level 2 – Analytical Methods

- a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
- b. **pH:** Risk Level 2 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 2 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.
- c. **Turbidity:** Risk Level 2 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

## 10. Risk Level 2 - Non-Storm Water Discharge Monitoring Requirements

## a. Visual Monitoring Requirements:

- i. Risk Level 2 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
- ii. Risk Level 2 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
- iii. Risk Level 2 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 2 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

## b. Effluent Sampling Locations:

- i. Risk Level 2 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.
- ii. Risk Level 2 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.
- iii. Risk Level 2 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

**11. Risk Level 2 – Non-Visible Pollutant Monitoring Requirements**

- a. Risk Level 2 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual

inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

- b. Risk Level 2 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 2 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 2 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 2 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 2 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).
- f. Risk Level 2 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 2 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.<sup>6</sup>
- h. Risk Level 2 dischargers shall keep all field /or analytical data in the SWPPP document.

## **12. Risk Level 2 – Watershed Monitoring Option**

Risk Level 2 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

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<sup>6</sup> For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

**13. Risk Level 2 – Particle Size Analysis for Project Risk Justification**

Risk Level 2 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

**14. Risk Level 2 – Records**

Risk Level 2 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 2 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.
- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.
- f. Rain gauge readings from site inspections;
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).
- i. Visual observation and sample collection exception records (see Section I.6 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.



**15. Risk Level 2 – NAL Exceedance Report**

- a. In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.
- b. Risk Level 2 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.
- c. Risk Level 2 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.
- d. Risk Level 2 dischargers shall include in the NAL Exceedance Report:
  - i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit").
  - ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
  - iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

**Table 3 – Risk Level 2 Test Methods, Detection Limits, Reporting Units and Applicable NALs/NELs**

| Parameter | Test Method / Protocol                                           | Discharge Type                         | Min. Detection Limit | Reporting Units | Numeric Action Level               |
|-----------|------------------------------------------------------------------|----------------------------------------|----------------------|-----------------|------------------------------------|
| pH        | Field test with calibrated portable instrument                   | Risk Level 2 Discharges                | 0.2                  | pH units        | lower NAL = 6.5<br>upper NAL = 8.5 |
| Turbidity | EPA 0180.1 and/or field test with calibrated portable instrument | Risk Level 2 Discharges other than ATS | 1                    | NTU             | 250 NTU                            |
|           |                                                                  | For ATS discharges                     | 1                    | NTU             | N/A                                |

## **ATTACHMENT E RISK LEVEL 3 REQUIREMENTS**

### **A. Effluent Standards**

*[These requirements are the same as those in the General Permit order.]*

1. Narrative – Risk Level 3 dischargers shall comply with the narrative effluent standards listed below:
  - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
  - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric –Risk Level 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

### **B. Good Site Management "Housekeeping"**

1. Risk Level 3 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 3 dischargers shall implement the following good housekeeping measures:
  - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
  - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 3 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
  - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
  - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
  - d. Cover waste disposal containers at the end of every business day and during a rain event.
  - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
  - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
  - g. Implement procedures that effectively address hazardous and non-hazardous spills.
  - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
    - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

- ii. Appropriate spill response personnel are assigned and trained.
  - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 3 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
- a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
  - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
  - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 3 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
- a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
  - b. Contain fertilizers and other landscape materials when they are not actively being used.
  - c. Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
  - d. Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
  - e. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 3 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 3 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
  - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
  - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
  - d. Ensure retention of sampling, visual observation, and inspection records.
  - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 3 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.
  7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

### C. Non-Storm Water Management

1. Risk Level 3 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 3 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 3 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

#### **D. Erosion Control**

1. Risk Level 3 dischargers shall implement effective wind erosion control.
2. Risk Level 3 dischargers shall provide effective soil cover for inactive<sup>1</sup> areas and all finished slopes, open space, utility backfill, and completed lots.
3. Dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

#### **E. Sediment Controls**

1. Risk Level 3 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 3 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.
3. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active<sup>2</sup> construction.
4. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths<sup>3</sup> in accordance with Table 1.

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<sup>1</sup> Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

<sup>2</sup> Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage

<sup>3</sup> Sheet flow length is the length that shallow, low velocity flow travels across a site.

**Table 1 - Critical Slope/Sheet Flow Length Combinations**

| <b>Slope Percentage</b> | <b>Sheet flow length not to exceed</b> |
|-------------------------|----------------------------------------|
| 0-25%                   | 20 feet                                |
| 25-50%                  | 15 feet                                |
| Over 50%                | 10 feet                                |

5. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.
6. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).
8. **Additional Risk Level 3 Requirement:** The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

#### **F. Run-on and Run-off Controls**

Risk Level 3 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

#### **G. Inspection, Maintenance and Repair**

1. Risk Level 3 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).



2. Risk Level 3 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.
3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 3 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 3 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 3 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
  - a. Inspection date and date the inspection report was written.
  - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
  - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
  - d. A description of any BMPs evaluated and any deficiencies noted.
  - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
  - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
  - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
  - h. Photographs taken during the inspection, if any.

- i. Inspector's name, title, and signature.

## H. Rain Event Action Plan

1. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).
2. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).
3. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:
  - a. Site Address.
  - b. Calculated Risk Level (2 or 3).
  - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
  - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
  - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
4. **Additional Risk Level 3 Requirement:** The QSP shall include in the REAP, at a minimum, the following project phase information:
  - a. Activities associated with each construction phase.
  - b. Trades active on the construction site during each construction phase.
  - c. Trade contractor information.
  - d. Suggested actions for each project phase.
5. **Additional Risk Level 3 Requirement:** The QSP shall develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

- a. Site Address.
  - b. Calculated Risk Level (2 or 3).
  - c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
  - d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
  - e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
  - f. Trades active on site during Inactive Construction.
  - g. Trade contractor information.
  - h. Suggested actions for inactive construction sites.
6. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.
7. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

## I. Risk Level 3 Monitoring and Reporting Requirements

**Table 2- Summary of Monitoring Requirements**

| Risk Level | Visual Inspections                  |                 |          |                 |            | Sample Collection     |                      |
|------------|-------------------------------------|-----------------|----------|-----------------|------------|-----------------------|----------------------|
|            | Quarterly Non-storm Water Discharge | Pre-storm Event |          | Daily Storm BMP | Post Storm | Storm Water Discharge | Receiving Water      |
|            |                                     | Baseline        | REAP     |                 |            |                       |                      |
| <b>3</b>   | <b>X</b>                            | <b>X</b>        | <b>X</b> | <b>X</b>        | <b>X</b>   | <b>X</b>              | <b>X<sup>4</sup></b> |

### 1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Program in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

### 2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

<sup>4</sup> When receiving water monitoring trigger is exceeded

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of this General Permit.
- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.
- c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.
- d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

**3. Risk Level 3 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

- a. Risk Level 3 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
- b. Risk Level 3 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
- c. Risk Level 3 dischargers shall conduct visual observations (inspections) during business hours only.
- d. Risk Level 3 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
- e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 3 dischargers shall visually observe (inspect):
  - i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

- ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.
- iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in c.i. and c.iii above, Risk Level 3 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 3 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 3 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

#### **4. Risk Level 3 – Water Quality Sampling and Analysis**

- a. Risk Level 3 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.
- b. At minimum, Risk Level 3 dischargers shall collect 3 samples per day of the qualifying event.
- c. Risk Level 3 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

#### **Storm Water Effluent Monitoring Requirements**

- d. Risk Level 3 dischargers shall analyze their effluent samples for:
  - i. pH and turbidity.

- ii. Any additional parameters for which monitoring is required by the Regional Water Board.
- e. Risk 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event.

#### Receiving Water Monitoring Requirements

- f. In the event that a Risk Level 3 discharger's effluent exceeds the daily average receiving water monitoring trigger of 500 NTU turbidity or the daily average pH range 6.0-9.0 contained in this General Permit and has a direct discharge into receiving waters, the Risk Level 3 discharger shall subsequently sample receiving waters (RWs) for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit. If a Risk Level 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.
- g. Risk Level 3 dischargers disturbing 30 acres or more of the landscape and with direct discharges into receiving waters shall conduct or participate in benthic macroinvertebrate bioassessment of RWs prior to commencement of construction activity (See Appendix 3).
- h. Risk Level 3 dischargers shall obtain RW samples in accordance with the Receiving Water sampling location section (Section I.5), below.

#### **5. Risk Level 3 – Storm Water Discharge Water Quality Sampling Locations**

##### Effluent Sampling Locations

- a. Risk Level 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.
- b. Risk Level 3 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

- c. Risk Level 3 dischargers shall ensure that storm water discharge collected and observed represent<sup>5</sup> the effluent in each drainage area based on visual observation of the water and upstream conditions.
- d. Risk Level 3 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.
- e. Risk Level 3 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
- f. Risk Level 3 dischargers shall select analytical test methods from the list provided in Table 3 below.
- g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 "Storm Water Sample Collection and Handling Instructions" below.

#### Receiving Water Sampling Locations

- h. **Upstream/up-gradient RW samples:** Risk Level 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible and upstream from the effluent discharge point.
- i. **Downstream/down-gradient RW samples:** Risk Level 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible and downstream from the effluent discharge point.
- j. If two or more discharge locations discharge to the same receiving water, Risk Level 3 dischargers may sample the receiving water at a single upstream and downstream location.

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<sup>5</sup> For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment-laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment laden water even if most water flowing through the fence is clear.



**6. Risk Level 3 – Visual Observation and Sample Collection Exemptions**

- a. Risk Level 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 3 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:
  - i. During dangerous weather conditions such as flooding and electrical storms.
  - ii. Outside of scheduled site business hours.
- b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 3 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

**7. Risk Level 3 – Storm Water Sample Collection and Handling Instructions**

- a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.
- b. Risk Level 3 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.
- c. Risk Level 3 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).<sup>6</sup>

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<sup>6</sup> Additional information regarding SWAMP's QAPrP can be found at [http://www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/).

QAPrP: [http://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/qapp/swamp\\_qapp\\_master090108a.pdf](http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf)

**8. Risk Level 3 – Monitoring Methods**

- a. Risk Level 3 dischargers shall include a description of the following items in the CSMP:
  - i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.
  - ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program an example Chain of Custody form used when handling and shipping samples.
  - iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.
- b. Risk Level 3 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 3 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). Risk Level 3 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

**9. Risk Level 3 – Analytical Methods**

- a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

- b. **pH:** Risk Level 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 3 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.
- c. **Turbidity:** Risk Level 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).
- d. **Suspended sediment concentration (SSC):** Risk Level 3 dischargers that exceed the turbidity Receiving Water Monitoring Trigger shall perform SSC analysis using ASTM Method D3977-97.
- e. **Bioassessment:** Risk Level 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

#### 10. Risk Level 3 - Non-Storm Water Discharge Monitoring Requirements

- a. Visual Monitoring Requirements:
  - i. Risk Level 3 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
  - ii. Risk Level 3 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
  - iii. Risk Level 3 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 3 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to

reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

- i. Risk Level 3 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.
- ii. Risk Level 3 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.
- iii. Risk Level 3 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

**11. Risk Level 3 – Non-Visible Pollutant Monitoring Requirements**

- a. Risk Level 3 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 3 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 3 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 3 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 3 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).
- f. Risk Level 3 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

- g. Risk Level 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.<sup>7</sup>
- h. Risk Level 3 dischargers shall keep all field /or analytical data in the SWPPP document.

#### **12. Risk Level 3 – Watershed Monitoring Option**

Risk Level 3 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

#### **13. Risk Level 3 – Particle Size Analysis for Project Risk Justification**

Risk Level 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

#### **14. Risk Level 3 – Records**

Risk Level 3 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 3 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.

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<sup>7</sup> For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- d. The individual(s) who performed the analyses.
- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).
- i. Visual observation and sample collection exception records (see Section I.6 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

#### **15. Risk Level 3 – NAL Exceedance Report**

- a. Risk Level 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.
- b. Risk Level 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity In this General Permit.
- c. Risk Level 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.
- d. Risk Level 3 dischargers shall include in the NAL Exceedance Report:
  - i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

- ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
- iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

#### 16. Risk Level 3 – Bioassessment

- a. Risk Level 3 dischargers with a total project-related ground disturbance exceeding 30 acres shall:
  - i. Conduct bioassessment monitoring, as described in Appendix 3.
  - ii. Include the collection and reporting of specified in stream biological data and physical habitat.
  - iii. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).<sup>8</sup>
- b. Risk Level 3 dischargers qualifying for bioassessment, where construction commences out of an index period for the site location shall:
  - i. Receive Regional Board approval for the sampling exception.
  - ii. Conduct bioassessment monitoring, as described in Appendix 3.
  - iii. Include the collection and reporting of specified instream biological data and physical habitat.
  - iv. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).

OR

- v. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.

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<sup>8</sup> [http://www.waterboards.ca.gov/water\\_issues/programs/swamp/](http://www.waterboards.ca.gov/water_issues/programs/swamp/).

- vi. Send a copy of the check to the Regional Water Board office for the site's region.
- vii. Invest **\$7,500.00 X The number of samples required** into the SWAMP program as compensation (upon regional board approval).



**Table 3 – Risk Level 3 Test Methods, Detection Limits, Reporting Units and Applicable NALs**

| Parameter     | Test Method / Protocol                                                | Discharge Type                                                | Min. Detection Limit | Reporting Units | Numeric Action Level               | Numeric Effluent Limitation                                         | Receiving Water Monitoring Trigger                                  |
|---------------|-----------------------------------------------------------------------|---------------------------------------------------------------|----------------------|-----------------|------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
| pH            | Field test with calibrated portable instrument                        | Risk Level 3 Discharges                                       | 0.2                  | pH units        | lower NAL = 6.5<br>upper NAL = 8.5 | N/A                                                                 | lower limit = 6.0<br>upper limit = 9.0                              |
| Turbidity     | EPA 0180.1 and/or field test with calibrated portable instrument      | Risk Level 3 Discharges other than ATS                        | 1                    | NTU             | 250 NTU                            | N/A                                                                 | 500 NTU                                                             |
|               |                                                                       | For ATS discharges                                            | 1                    | NTU             | N/A                                | 10 NTU for Daily Weighted Average &<br>20 NTU for Any Single Sample | 10 NTU for Daily Weighted Average &<br>20 NTU for Any Single Sample |
| SSC           | ASTM Method D 3977-97 <sup>9</sup>                                    | Risk Level 3 (if Receiving Water Monitoring Trigger exceeded) | 5                    | mg/L            | N/A                                | N/A                                                                 | N/A                                                                 |
| Bioassessment | (STE) Level I of (SAFIT), <sup>10</sup> fixed-count of 600 org/sample | Risk Level 3 projects > 30 acres                              | N/A                  | N/A             | N/A                                | N/A                                                                 | N/A                                                                 |

<sup>9</sup> ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394.

<sup>10</sup> The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: [http://www.swrcb.ca.gov/swamp/docs/safit/ste\\_list.pdf](http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf). When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.



## ATTACHMENT F: Active Treatment System (ATS) Requirements

**Table 1 – Numeric Effluent Limitations, Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units**

| Parameter | Test Method                                                        | Discharge Type     | Min. Detection Limit | Units | Numeric Action Level | Numeric Effluent Limitation                                           |
|-----------|--------------------------------------------------------------------|--------------------|----------------------|-------|----------------------|-----------------------------------------------------------------------|
| Turbidity | EPA 0180.1 and/or field test with a calibrated portable instrument | For ATS discharges | 1                    | NTU   | N/A                  | 10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample |

- A.** Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this Attachment.
- B.** The discharger shall maintain a paper copy of each ATS specification onsite in compliance with the record retention requirements in the Special Provisions of this General Permit.

### **C. ATS Design, Operation and Submittals**

1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.
2. The discharger shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc<sup>1</sup> during floc pumping or related operations.
3. The discharger shall design outlets to dissipate energy from concentrated flows.
4. The discharger shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction storm

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<sup>1</sup> Floc is defined as a clump of solids formed by the chemical action in ATS systems.

water experience or who is a licensed contractors specifically holding a California Class A Contractors license.<sup>2</sup>

5. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:
  - a. ATS Operation and Maintenance Manual for All Equipment.
  - b. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC).
  - c. ATS Health and Safety Plan.
  - d. ATS Spill Prevention Plan.
6. The ATS shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

#### **D. Treatment – Chemical Coagulation/Flocculation**

1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).
2. The discharger shall conduct, at minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for their ATS.
3. Single field jar tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.

#### **E. Residual Chemical and Toxicity Requirements**

1. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold

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<sup>2</sup> Business and Professions Code Division 3, Chapter 9, Article 4, Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. [<http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp>].

concentration<sup>3</sup> (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.

2. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.
3. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.
4. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment<sup>4</sup> mode.
5. A discharger planning to operate in Batch Treatment mode shall perform toxicity testing in accordance with the following:
  - a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge<sup>5</sup>. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.<sup>6</sup>
  - b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.
  - c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.
  - d. The discharger shall electronically report all acute toxicity testing.

<sup>3</sup> The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

<sup>4</sup> Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.

<sup>5</sup> This requirement only requires that the test be initiated prior to discharge.

<sup>6</sup> [http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT\\_Desc.pdf](http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf).

**F. Filtration**

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.
2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

**G. Residuals Management**

1. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.
2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

**H. ATS Instrumentation**

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.
2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:
  - a. Influent Turbidity
  - b. Effluent Turbidity
  - c. Influent pH
  - d. Effluent pH
  - e. Residual Chemical
  - f. Effluent Flow rate
  - g. Effluent Flow volume
3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.

4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.
5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.
6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.
7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC plan.
8. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.
9. The instrumentation system shall include a method for controlling coagulant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

#### **I. ATS Effluent Discharge**

1. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.
2. NELs for discharges from an ATS:
  - a. Turbidity of all ATS discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.
  - b. Residual Chemical shall be < 10% of MATC<sup>7</sup> for the most sensitive species of the chemical used.

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<sup>7</sup> The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

3. If an analytical effluent sampling result exceeds the turbidity NEL (as listed in Table 1), the discharger is in violation of this General Permit and shall electronically file the results in violation within 24-hours of obtaining the results.
4. If ATS effluent is authorized to discharge into a sanitary sewer system, the discharger shall comply with any pre-treatment requirements applicable for that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.
5. Compliance Storm Event:

Discharges of storm water from ATS shall comply with applicable NELs (above) unless the storm event causing the discharges is determined after the fact to be equal to or larger than the Compliance Storm Event (expressed in inches of rainfall). The Compliance Storm Event for ATS discharges is the 10 year, 24 hour storm, as determined using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca10y24.gif>  
<http://www.wrcc.dri.edu/pcpnfreq/sca10y24.gif>

This exemption is dependent on the submission of rain gauge data verifying the storm event is equal to or larger than the Compliance Storm.

## **J. Operation and Maintenance Plan**

1. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.<sup>8</sup>
2. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.
3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems, and other equipment.

## **K. Sampling and Reporting Quality Assurance/ Quality Check (QA/QC) Plan**

4. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:
  - a. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.

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<sup>8</sup> The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.



- b. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.
- c. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

#### **L. Personnel Training**

- 1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.
- 2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.
- 3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:
  - a. Coagulation Basics –Chemistry and physical processes
  - b. ATS System Design and Operating Principles
  - c. ATS Control Systems
  - d. Coagulant Selection – Jar testing, dose determination, etc.
  - e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety
  - f. Monitoring, Sampling, and Analysis
  - g. Reporting and Recordkeeping
  - h. Emergency Response

#### **M. Active Treatment System (ATS) Monitoring Requirements**

Any discharger who deploys an ATS on their site shall conduct the following:

- 1. Visual Monitoring
  - a. A designated responsible person shall be on site daily at all times during treatment operations.

- b. Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.
  - i. The log shall include the name and phone number of the person responsible for system operation and monitoring.
  - ii. The log shall include documentation of the responsible person's training.

## 2. Operational and Compliance Monitoring

- a. Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.
- b. Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.
- c. Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.
- d. The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.
- e. Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.
- f. Laboratory duplicates – monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained onsite.
- g. Effluent shall be monitored and recorded for residual chemical/additive levels.
- h. If a residual chemical/additive test does not exist and the ATS is operating in a batch treatment mode of operation refer to the toxicity monitoring requirements below.

## 3. Toxicity Monitoring

A discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:

- a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.<sup>9</sup> All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS)

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<sup>9</sup> This requirement only requires that the test be initiated prior to discharge.

Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.<sup>10</sup>

- b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in “Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012” for Fathead minnow, *Pimephales promelas* or Rainbow trout *Oncorhynchus mykiss* may be used as a substitute for fathead minnow.
- c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.<sup>11</sup>

#### 4. Reporting and Recordkeeping

At a minimum, every 30 days a LRP representing the discharger shall access the State Water Boards Storm Water Multi-Application and Report Tracking system (SMARTS) and electronically upload field data from the ATS. Records must be kept for three years after the project is completed .

#### 5. Non-compliance Reporting

- a. Any indications of toxicity or other violations of water quality objectives shall be reported to the appropriate regulatory agency as required by this General Permit.
- b. Upon any measurements that exceed water quality standards, the system operator shall immediately notify his supervisor or other responsible parties, who shall notify the Regional Water Board.
- c. If any monitoring data exceeds any applicable NEL in this General Permit, the discharger shall electronically submit a NEL Violation Report to the State Water Board within 24 hours after the NEL exceedance has been identified.
  - i. ATS dischargers shall certify each NEL Violation Report in accordance with the Special Provisions for Construction Activity in this General Permit.
  - ii. ATS dischargers shall retain an electronic or paper copy of each NEL Violation Report for a minimum of three years after the date the annual report is filed.
  - iii. ATS dischargers shall include in the NEL Violation Report:

<sup>10</sup> [http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT\\_Desc.pdf](http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf).

<sup>11</sup> <http://www.epa.gov/waterscience/methods/wet/>.

- (1) The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”);
  - (2) The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and
  - (3) A description of the current onsite BMPs, and the proposed corrective actions taken to manage the NEL exceedance.
- iv. Compliance Storm Exemption - In the event that an applicable NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event, ATS dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification.

[illegible]

|    | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | B          | C            |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|
| 1  | <b>Sediment Risk Factor Worksheet</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            | <b>Entry</b> |
| 2  | <b>A) R Factor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |              |
| 3  | Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 4  | <a href="http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm">http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |              |
| 5  | <b>R Factor Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0          |              |
| 6  | <b>B) K Factor (weighted average, by area, for all site soils)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |              |
| 7  | The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted. |            |              |
| 8  | <a href="#">Site-specific K factor guidance</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 9  | <b>K Factor Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0          |              |
| 10 | <b>C) LS Factor (weighted average, by area, for all slopes)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 11 | The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.                                                                                                                                                                                                                                                                                                                                                                                                                           |            |              |
| 12 | <a href="#">LS Table</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |              |
| 13 | <b>LS Factor Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0          |              |
| 14 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 15 | <b>Watershed Erosion Estimate (=R x K x LS) in tons/acre</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0          |              |
| 16 | <b>Site Sediment Risk Factor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Low</b> |              |
| 17 | Low Sediment Risk: < 15 tons/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |              |
| 18 | Medium Sediment Risk: >=15 and <75 tons/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |              |
| 19 | High Sediment Risk: >= 75 tons/acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |              |
| 20 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 21 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 22 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 23 | <b>GIS Map Method:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |              |
| 24 | 1. The R factor for the project is calculated using the online calculator at:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |              |
| 25 | <a href="http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm">http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |              |
| 26 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 27 | 2. The K and LS factors may be obtained by accessing the GIS maps located on the State Water Board FTP website at:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |              |
| 28 | <a href="ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwg/cgp/Risk/">ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwg/cgp/Risk/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |
| 29 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |              |

| Receiving Water (RW) Risk Factor Worksheet                                                                                                                                                                                                                                                                                                                                                                                                                        |  | Entry  | Score |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------|-------|
| A. Watershed Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | yes/no |       |
| A.1. Does the disturbed area discharge (either directly or indirectly) to a <b>303(d)-listed waterbody impaired by sediment</b> (For help with impaired waterbodies please visit the link below) or has a <b>USEPA approved TMDL implementation plan for sediment</b> ?<br><a href="http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml">http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml</a><br><b>OR</b> |  | no     | Low   |
| A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)<br><a href="http://www.waterboards.ca.gov/waterboards_map.shtml">http://www.waterboards.ca.gov/waterboards_map.shtml</a>                                                                                                                                                    |  |        |       |
| <a href="#">Region 1 Basin Plan</a><br><a href="#">Region 2 Basin Plan</a><br><a href="#">Region 3 Basin Plan</a><br><a href="#">Region 4 Basin Plan</a><br><a href="#">Region 5 Basin Plan</a><br><a href="#">Region 6 Basin Plan</a><br><a href="#">Region 7 Basin Plan</a><br><a href="#">Region 8 Basin Plan</a><br><a href="#">Region 9 Basin Plan</a>                                                                                                       |  |        |       |

| Combined Risk Level Matrix  |                      |         |         |
|-----------------------------|----------------------|---------|---------|
| <u>Receiving Water Risk</u> | <u>Sediment Risk</u> |         |         |
|                             | Low                  | Medium  | High    |
|                             | Low                  | Level 1 | Level 2 |
| High                        | Level 2              |         | Level 3 |

Project Sediment Risk: **Low**

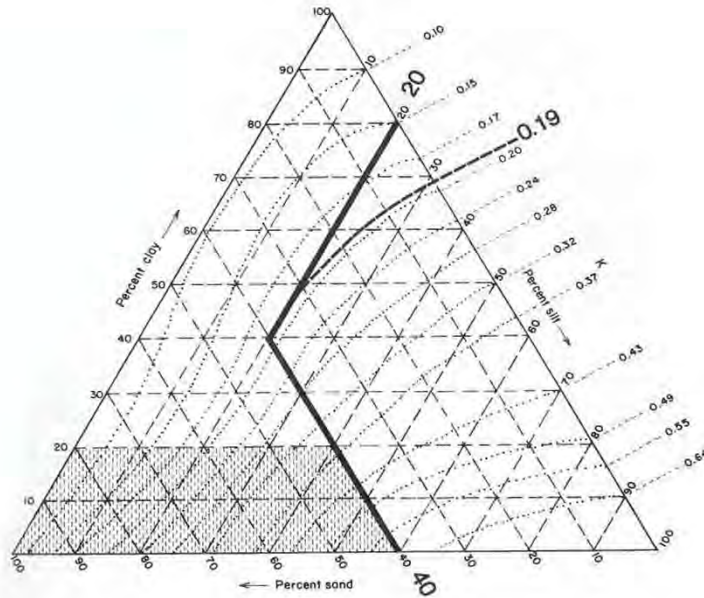
Project RW Risk: **Low**

Project Combined Risk: **Level 1**



### Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.



Erickson triangular nomograph used to estimate soil erodibility (K) factor.

The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

| Sheet<br>Flow<br>Length<br>(ft) | Average Watershed Slope (%) |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |
|---------------------------------|-----------------------------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                 | 0.2                         | 0.5  | 1.0  | 2.0  | 3.0  | 4.0  | 5.0  | 6.0  | 8.0  | 10.0 | 12.0 | 14.0  | 16.0  | 20.0  | 25.0  | 30.0  | 40.0  | 50.0  | 60.0  |
| <3                              | 0.05                        | 0.07 | 0.09 | 0.13 | 0.17 | 0.20 | 0.23 | 0.26 | 0.32 | 0.35 | 0.36 | 0.38  | 0.39  | 0.41  | 0.45  | 0.48  | 0.53  | 0.58  | 0.63  |
| 6                               | 0.05                        | 0.07 | 0.09 | 0.13 | 0.17 | 0.20 | 0.23 | 0.26 | 0.32 | 0.37 | 0.41 | 0.45  | 0.49  | 0.56  | 0.64  | 0.72  | 0.85  | 0.97  | 1.07  |
| 9                               | 0.05                        | 0.07 | 0.09 | 0.13 | 0.17 | 0.20 | 0.23 | 0.26 | 0.32 | 0.38 | 0.45 | 0.51  | 0.56  | 0.67  | 0.80  | 0.91  | 1.13  | 1.31  | 1.47  |
| 12                              | 0.05                        | 0.07 | 0.09 | 0.13 | 0.17 | 0.20 | 0.23 | 0.26 | 0.32 | 0.39 | 0.47 | 0.55  | 0.62  | 0.76  | 0.93  | 1.08  | 1.37  | 1.62  | 1.84  |
| 15                              | 0.05                        | 0.07 | 0.09 | 0.13 | 0.17 | 0.20 | 0.23 | 0.26 | 0.32 | 0.40 | 0.49 | 0.58  | 0.67  | 0.84  | 1.04  | 1.24  | 1.59  | 1.91  | 2.19  |
| 25                              | 0.05                        | 0.07 | 0.10 | 0.16 | 0.21 | 0.26 | 0.31 | 0.36 | 0.45 | 0.57 | 0.71 | 0.85  | 0.98  | 1.24  | 1.56  | 1.86  | 2.41  | 2.91  | 3.36  |
| 50                              | 0.05                        | 0.08 | 0.13 | 0.21 | 0.30 | 0.38 | 0.46 | 0.54 | 0.70 | 0.91 | 1.15 | 1.40  | 1.64  | 2.10  | 2.67  | 3.22  | 4.24  | 5.16  | 5.97  |
| 75                              | 0.05                        | 0.08 | 0.14 | 0.25 | 0.36 | 0.47 | 0.58 | 0.69 | 0.91 | 1.20 | 1.54 | 1.87  | 2.21  | 2.86  | 3.67  | 4.44  | 5.89  | 7.20  | 8.37  |
| 100                             | 0.05                        | 0.09 | 0.15 | 0.28 | 0.41 | 0.55 | 0.68 | 0.82 | 1.10 | 1.46 | 1.88 | 2.31  | 2.73  | 3.57  | 4.59  | 5.58  | 7.44  | 9.13  | 10.63 |
| 150                             | 0.05                        | 0.09 | 0.17 | 0.33 | 0.50 | 0.68 | 0.86 | 1.05 | 1.43 | 1.92 | 2.51 | 3.09  | 3.68  | 4.85  | 6.30  | 7.70  | 10.35 | 12.75 | 14.89 |
| 200                             | 0.06                        | 0.10 | 0.18 | 0.37 | 0.57 | 0.79 | 1.02 | 1.25 | 1.72 | 2.34 | 3.07 | 3.81  | 4.56  | 6.04  | 7.88  | 9.67  | 13.07 | 16.16 | 18.92 |
| 250                             | 0.06                        | 0.10 | 0.19 | 0.40 | 0.64 | 0.89 | 1.16 | 1.43 | 1.99 | 2.72 | 3.60 | 4.48  | 5.37  | 7.16  | 9.38  | 11.55 | 15.67 | 19.42 | 22.78 |
| 300                             | 0.06                        | 0.10 | 0.20 | 0.43 | 0.69 | 0.98 | 1.28 | 1.60 | 2.24 | 3.09 | 4.09 | 5.11  | 6.15  | 8.23  | 10.81 | 13.35 | 18.17 | 22.57 | 26.51 |
| 400                             | 0.06                        | 0.11 | 0.22 | 0.48 | 0.80 | 1.14 | 1.51 | 1.90 | 2.70 | 3.75 | 5.01 | 6.30  | 7.60  | 10.24 | 13.53 | 16.77 | 22.95 | 28.60 | 33.67 |
| 600                             | 0.06                        | 0.12 | 0.24 | 0.56 | 0.96 | 1.42 | 1.91 | 2.43 | 3.52 | 4.95 | 6.67 | 8.45  | 10.26 | 13.94 | 18.57 | 23.14 | 31.89 | 39.95 | 47.18 |
| 800                             | 0.06                        | 0.12 | 0.26 | 0.63 | 1.10 | 1.65 | 2.25 | 2.89 | 4.24 | 6.03 | 8.17 | 10.40 | 12.69 | 17.35 | 23.24 | 29.07 | 40.29 | 50.63 | 59.93 |
| 1000                            | 0.06                        | 0.13 | 0.27 | 0.69 | 1.23 | 1.86 | 2.55 | 3.30 | 4.91 | 7.02 | 9.57 | 12.23 | 14.96 | 20.57 | 27.66 | 34.71 | 48.29 | 60.84 | 72.15 |

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

## APPENDIX 2: Post-Construction Water Balance Performance Standard Spreadsheet

The discharger shall submit with their Notice of Intent (NOI) the following information to demonstrate compliance with the New and Re-Development Water Balance Performance Standard.

### **Map Instructions**

The discharger must submit a small-scale topographic map of the site to show the existing contour elevations, pre- and post-construction drainage divides, and the total length of stream in each watershed area. Recommended scales include 1 in. = 20 ft., 1 in. = 30 ft., 1 in. = 40 ft., or 1 in. = 50 ft. The suggested contour interval is usually 1 to 5 feet, depending upon the slope of the terrain. The contour interval may be increased on steep slopes. Other contour intervals and scales may be appropriate given the magnitude of land disturbance.

### **Spreadsheet Instructions**

The intent of the spreadsheet is to help dischargers calculate the project-related increase in runoff volume and select impervious area and runoff reduction credits to reduce the project-related increase in runoff volume to pre-project levels.

The discharger has the option of using the spreadsheet (**Appendix 2.1**) or a more sophisticated, watershed process-based model (e.g. Storm Water Management Model, Hydrological Simulation Program Fortran) to determine the project-related increase in runoff volume.

***In Appendix 4.1, you must complete the worksheet for each land use/soil type combination for each project sub-watershed.***

**Steps 1 through 9 pertain specifically to the Runoff Volume Calculator:**

Step 1: Enter the county where the project is located in cell H3.

Step 2: Enter the soil type in cell H6.

Step 3: Enter the existing pervious (dominant) land use type in cell H7.

Step 4: Enter the proposed pervious (dominant) land use type in cell H8.

Step 5: Enter the total project site area in cell H11 or J11.

Step 6: Enter the sub-watershed area in cell H12 or J12.

- Step 7: Enter the existing rooftop area in cell H17 or J17, the existing non-rooftop impervious area in cell H18 or J18, the proposed rooftop area in cell H19 or J19, and the proposed non-rooftop impervious area in cell H20 or J20
- Step 8: Work through each of the impervious area reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.
- Step 9: Work through each of the impervious volume reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

#### **Non-structural Practices Available for Crediting**

- ***Porous Pavement***
- ***Tree Planting***
- ***Downspout Disconnection***
- ***Impervious Area Disconnection***
- ***Green Roof***
- ***Stream Buffer***
- ***Vegetated Swales***
- ***Rain Barrels and Cisterns***
- ***Landscaping Soil Quality***

| A  | B                                                                                                                                                          | C | D        | E                                                                                                 | F                                                                                         | G                                                                                                                                                                                                                                                                       | H                                                                | I                                                                                   | J                   | K     | L                | M | N |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------|-------|------------------|---|---|
| 1  | Post-Construction Water Balance Calculator                                                                                                                 |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 2  |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 3  | User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you. |   |          | (Step 1a) If you know the 85th percentile storm event for your location enter it in the box below |                                                                                           | (Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left. |                                                                  | SACRAMENTO                                                                          |                     |       |                  |   |   |
| 4  |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           | (Step 1c) If you would like a more precise value select the location closest to your site. If you do not recognize any of these locations, leave this drop-down menu at location. The average value for the County will be used.                                        |                                                                  | SACRAMENTO FAA ARPT                                                                 |                     |       |                  |   |   |
| 5  | Project Information                                                                                                                                        |   |          | Runoff Calculations                                                                               |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 6  | Project Name:                                                                                                                                              |   | Optional |                                                                                                   | (Step 2) Indicate the Soil Type (dropdown menu to right):                                 |                                                                                                                                                                                                                                                                         | Group C Soils                                                    | Low infiltration. Sandy clay loam. Infiltration rate 0.05 to 0.15 inch/hr when wet. |                     |       |                  |   |   |
| 7  | Waste Discharge Identification (WDID):                                                                                                                     |   | Optional |                                                                                                   | (Step 3) Indicate the existing dominant non-built land Use Type (dropdown menu to right): |                                                                                                                                                                                                                                                                         | Wood & Grass: <50% ground cover                                  |                                                                                     |                     |       |                  |   |   |
| 8  | Date:                                                                                                                                                      |   | Optional |                                                                                                   | (Step 4) Indicate the proposed dominant non-built land Use Type (dropdown menu to right): |                                                                                                                                                                                                                                                                         | Lawn, Grass, or Pasture covering more than 75% of the open space |                                                                                     |                     |       |                  |   |   |
| 9  | Sub Drainage Area Name (from map):                                                                                                                         |   | Optional |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Complete Either                                                  |                                                                                     |                     |       |                  |   |   |
| 10 | Runoff Curve Numbers                                                                                                                                       |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Sq Ft                                                            |                                                                                     | Acres               | Acres |                  |   |   |
| 11 | Existing Pervious Runoff Curve Number                                                                                                                      |   | 82       |                                                                                                   | (Step 5) Total Project Site Area:                                                         |                                                                                                                                                                                                                                                                         |                                                                  | 5.00                                                                                | 5.00                |       |                  |   |   |
| 12 | Proposed Development Pervious Runoff Curve Number                                                                                                          |   | 74       |                                                                                                   | (Step 6) Sub-watershed Area:                                                              |                                                                                                                                                                                                                                                                         |                                                                  | 5.00                                                                                | 5.00                |       |                  |   |   |
| 13 | Design Storm                                                                                                                                               |   |          |                                                                                                   | Percent of total project :                                                                |                                                                                                                                                                                                                                                                         | 100%                                                             |                                                                                     |                     |       |                  |   |   |
| 14 | Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area.                                 |   | 0.62     |                                                                                                   | in                                                                                        |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 15 | The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^)                                                |   | 0.44     |                                                                                                   | In                                                                                        |                                                                                                                                                                                                                                                                         | (Step 7) Sub-watershed Conditions                                |                                                                                     | Complete Either     |       | Calculated Acres |   |   |
| 16 | P used for calculations (in) (the greater of the above two criteria)                                                                                       |   | 0.62     |                                                                                                   | In                                                                                        |                                                                                                                                                                                                                                                                         | Sub-watershed Area (acres)                                       |                                                                                     | Sq Ft               | Acres | 5.00             |   |   |
| 17 | ^Available at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a>                                                                           |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Existing Rooftop Impervious Coverage                             |                                                                                     |                     | 0     | 0.00             |   |   |
| 18 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Existing Non-Rooftop Impervious Coverage                         |                                                                                     |                     | 0     | 0.00             |   |   |
| 19 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Proposed Rooftop Impervious Coverage                             |                                                                                     |                     | 0     | 0.00             |   |   |
| 20 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Proposed Non-Rooftop Impervious Coverage                         |                                                                                     |                     | 0     | 0.00             |   |   |
| 21 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 22 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Credits                                                          |                                                                                     | Acres               |       | Square Feet      |   |   |
| 23 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Porous Pavement</a>                                  |                                                                                     | 0.00                |       | 0                |   |   |
| 24 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Tree Planting</a>                                    |                                                                                     | 0.00                |       | 0                |   |   |
| 25 | Pre-Project Runoff Volume (cu ft)                                                                                                                          |   | 247      |                                                                                                   | Cu.Ft.                                                                                    |                                                                                                                                                                                                                                                                         | <a href="#">Downspout Disconnection</a>                          |                                                                                     | 0.00                |       | 0                |   |   |
| 26 | Project-Related Runoff Volume Increase w/o credits (cu ft)                                                                                                 |   | 0        |                                                                                                   | Cu.Ft.                                                                                    |                                                                                                                                                                                                                                                                         | <a href="#">Impervious Area Disconnection</a>                    |                                                                                     | 0.00                |       | 0                |   |   |
| 27 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Green Roof</a>                                       |                                                                                     | 0.00                |       | 0                |   |   |
| 28 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Stream Buffer</a>                                    |                                                                                     | 0.00                |       | 0                |   |   |
| 29 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Vegetated Swales</a>                                 |                                                                                     | 0.00                |       | 0                |   |   |
| 30 | Project-Related Volume Increase with Credits (cu ft)                                                                                                       |   | 0        |                                                                                                   | Cu.Ft.                                                                                    |                                                                                                                                                                                                                                                                         | Subtotal                                                         |                                                                                     | 0.00                |       | 0                |   |   |
| 31 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Subtotal Runoff Volume Reduction Credit                          |                                                                                     | 0 Cu. Ft.           |       |                  |   |   |
| 32 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 33 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | (Step 9) Impervious Volume Reduction Credits                     |                                                                                     | Volume (cubic feet) |       |                  |   |   |
| 34 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Rain Barrels/Cisterns</a>                            |                                                                                     | 0 Cu. Ft.           |       |                  |   |   |
| 35 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | <a href="#">Soil Quality</a>                                     |                                                                                     | 0 Cu. Ft.           |       |                  |   |   |
| 36 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Subtotal Runoff Volume Reduction                                 |                                                                                     | 0 Cu. Ft.           |       |                  |   |   |
| 37 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         | Total Runoff Volume Reduction Credit                             |                                                                                     | 0 Cu. Ft.           |       |                  |   |   |
| 38 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |
| 39 |                                                                                                                                                            |   |          |                                                                                                   |                                                                                           |                                                                                                                                                                                                                                                                         |                                                                  |                                                                                     |                     |       |                  |   |   |

# **Porous Pavement Credit Worksheet**

Please fill out a porous pavement credit worksheet for each project sub-watershed.

For the *PROPOSED* Development:

| Proposed Porous Pavement                                                                                               | Runoff Reduction* | Fill in either Acres or SqFt |          | Equivalent Acres |
|------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|----------|------------------|
|                                                                                                                        |                   | In SqFt.                     | In Acres |                  |
| Area of <b>Brick without Grout</b> on <u>less than 12 inches</u> of base with at least 20% void space over soil        | 0.45              |                              |          | 0.00             |
| Area of <b>Brick without Grout</b> on <u>more than 12 inches</u> of base with at least 20% void space over soil        | 0.90              |                              |          | 0.00             |
| Area of <b>Cobbles</b> <u>less than 12 inches</u> deep and over soil                                                   | 0.30              |                              |          | 0.00             |
| Area of <b>Cobbles</b> <u>less than 12 inches</u> deep and over soil                                                   | 0.60              |                              |          | 0.00             |
| Area of <b>Reinforced Grass Pavement</b> on <u>less than 12 inches</u> of base with at least 20% void space over soil  | 0.45              |                              |          | 0.00             |
| Area of <b>Reinforced Grass Pavement</b> on <u>at least 12 inches</u> of base with at least 20% void space over soil   | 0.90              |                              |          | 0.00             |
| Area of <b>Porous Gravel Pavement</b> on <u>less than 12 inches</u> of base with at least 20% void space over soil     | 0.38              |                              |          | 0.00             |
| Area of <b>Porous Gravel Pavement</b> on <u>at least 12 inches</u> of base with at least 20% void space over soil      | 0.75              |                              |          | 0.00             |
| Area of <b>Poured Porous Concrete or Asphalt Pavement</b> with <u>less than 4 inches</u> of gravel base (washed stone) | 0.40              |                              |          | 0.00             |
| Area of <b>Poured Porous Concrete or Asphalt Pavement</b> with <u>4 to 8 inches</u> of gravel base (washed stone)      | 0.60              |                              |          | 0.00             |
| Area of <b>Poured Porous Concrete or Asphalt Pavement</b> with <u>8 to 12 inches</u> of gravel base (washed stone)     | 0.80              |                              |          | 0.00             |
| Area of <b>Poured Porous Concrete or Asphalt Pavement</b> with <u>12 or more</u> inches of gravel base (washed stone)  | 1.00              |                              |          | 0.00             |

\*=1-Rv\*\*

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\*\*Using Site Design Techniques to meet Development Standards for Stormwater Quality (BASMAA 2003)

\*\*NCDENR Stormwater BMP Manual (2007)

### Tree Planting Credit Worksheet

Please fill out a tree canopy credit worksheet for each project sub-watershed.

| Tree Canopy Credit Criteria                                                                                                                                                                       | Number of Trees Planted  | Credit (acres) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|
| Number of proposed evergreen trees to be planted (credit = number of trees x 0.005)*                                                                                                              | 0                        | 0.00           |
| Number of proposed deciduous trees to be planted (credit = number of trees x 0.0025)*                                                                                                             |                          | 0.00           |
|                                                                                                                                                                                                   | Square feet Under Canopy |                |
| Square feet under an existing tree canopy, that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is LESS than 12 in diameter. |                          | 0.00           |
| Square feet under an existing tree canopy that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is 12 in diameter or GREATER. |                          | 0.00           |
| Please describe below how the project will ensure that these trees will be maintained.                                                                                                            |                          |                |
|                                                                                                                                                                                                   |                          |                |

0

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\* credit amount based on credits from Stormwater Quality Design Manual for the Sacramento and South Placer Regions

### Downspout Disconnection Credit Worksheet

Please fill out a downspout disconnection credit worksheet for each project subwatershed. If you answer yes to all questions, all rooftop area draining to each downspout will be subtracted from your proposed rooftop impervious coverage.

| Downspout Disconnection Credit Criteria                                                                                                                                                                                |      |       |                                                |                                      |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|------------------------------------------------|--------------------------------------|-------------------------------------|
| Do downspouts and any extensions extend at least six feet from a basement and two feet from a crawl space or concrete slab?                                                                                            |      |       |                                                | <input type="radio"/> Yes            | <input checked="" type="radio"/> No |
| Is the area of rooftop connecting to each disconnected downspout 600 square feet or less?                                                                                                                              |      |       |                                                | <input type="radio"/> Yes            | <input checked="" type="radio"/> No |
| Is the roof runoff from the design storm event fully contained in a raised bed or planter box or does it drain as sheet flow to a landscaped area large enough to contain the roof runoff from the design storm event? |      |       |                                                | <input type="radio"/> Yes            | <input checked="" type="radio"/> No |
|                                                                                                                                                                                                                        |      |       |                                                |                                      |                                     |
| The Stream Buffer and/or Vegetated Swale credits <b>will not</b> be taken in this sub-watershed area?                                                                                                                  |      |       |                                                | <input type="radio"/> Yes            | <input checked="" type="radio"/> No |
|                                                                                                                                                                                                                        |      |       |                                                |                                      |                                     |
| Percentage of existing                                                                                                                                                                                                 | 0.00 | Acres | of rooftop surface has disconnected downspouts |                                      |                                     |
| Percentage of the proposed                                                                                                                                                                                             | 0.00 | Acres | of rooftop surface has disconnected downspouts | 50                                   |                                     |
|                                                                                                                                                                                                                        |      |       |                                                | <a href="#">Return to Calculator</a> |                                     |



### Impervious Area Disconnection Credit Worksheet

Please fill out an impervious area disconnection credit worksheet for each project sub-watershed. If you answer yes to all questions, all non-rooftop impervious surface area will be subtracted from your proposed non-rooftop impervious coverage.

| Non-Rooftop Disconnection Credit Criteria                                                                                                                                                                                                           | Response                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Is the maximum contributing impervious flow path length less than 75 feet or, if equal or greater than 75 feet, is a storage device (e.g. French drain, bioretention area, gravel trench) implemented to achieve the required disconnection length? | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Is the impervious area to any one discharge location less than 5,000 square feet?                                                                                                                                                                   | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| The Stream Buffer credit <b>will not</b> be taken in this sub-watershed area?                                                                                                                                                                       | <input checked="" type="radio"/> Yes <input type="radio"/> No |

|                            |      |                                             |    |
|----------------------------|------|---------------------------------------------|----|
| Percentage of existing     | 0.00 | Acres non-rooftop surface area disconnected |    |
| Percentage of the proposed | 0.00 | Acres non-rooftop surface area disconnected | 70 |

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Green Roof Credit Worksheet

Please fill out a greenroof credit worksheet for each project sub-watershed. If you answer yes to all questions, 70% of the greenroof area will be subtracted from your proposed rooftop impervious coverage.

| Green Roof Credit Criteria                                                                                                                                                      |     |   |                                         | Response                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|-----------------------------------------|---------------------------------------------------------------|
| Is the roof slope less than 15% or does it have a grid to hold the substrate in place until it forms a thick vegetation mat?                                                    |     |   |                                         | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Has a professional engineer assessed the necessary load reserves and designed a roof structure to meet state and local codes?                                                   |     |   |                                         | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Is the irrigation needed for plant establishment and/or to sustain the green roof during extended dry periods, is the source from stored, recycled, reclaimed, or reused water? |     |   |                                         | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Percentage of existing                                                                                                                                                          | 0.0 | 0 | Acres rooftop surface area in greenroof |                                                               |
| Percentage of the proposed                                                                                                                                                      | 0.0 | 0 | Acres rooftop surface area in greenroof |                                                               |
|                                                                                                                                                                                 |     |   |                                         | <a href="#">Return to Calculator</a>                          |

Stream Buffer Credit Worksheet

Please fill out a stream buffer credit worksheet for each project sub-watershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout and/or Impervious Area Disconnection credits.

| Stream Buffer Credit Criteria                                                                                                                                                                |      |       |                                                               | Response                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|---------------------------------------------------------------|---------------------------------------------------------------|
| Does runoff enter the floodprone width* or within 500 feet (whichever is larger) of a stream channel as sheet flow**?                                                                        |      |       |                                                               | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Is the contributing overland slope 5% or less, or if greater than 5%, is a level spreader used?                                                                                              |      |       |                                                               | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Is the buffer area protected from vehicle or other traffic barriers to reduce compaction?                                                                                                    |      |       |                                                               | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Will the stream buffer be maintained in an ungraded and uncompacted condition and will the vegetation be maintained in a natural condition?                                                  |      |       |                                                               | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Percentage of existing                                                                                                                                                                       | 0.00 | Acres | impervious surface area draining into a stream buffer:        |                                                               |
| Percentage of the proposed                                                                                                                                                                   | 0.00 | Acres | impervious surface area that will drain into a stream buffer: |                                                               |
| Please describe below how the project will ensure that the buffer areas will remain in ungraded and uncompacted condition and that the vegetation will be maintained in a natural condition. |      |       |                                                               |                                                               |
|                                                                                                                                                                                              |      |       |                                                               |                                                               |

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\* floodprone width is the width at twice the bankfull depth.  
\*\* the maximum contributing length shall be 75 feet for impervious area

### Vegetated Swale Credit Worksheet

Please fill out a vegetated swale worksheet for each project subwatershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout Disconnection credit.

#### Vegetated Swale Credit Criteria

Have all vegetated swales been designed in accordance with Treatment Control BMP 30 (TC-30 - Vegetated Swale) from the California Stormwater BMP Handbook, New Development and Redevelopment (available at [www.cabmphandbooks.com](http://www.cabmphandbooks.com))?

☐ Yes ☒ No

Is the maximum flow velocity for runoff from the design storm event less than or equal to 1.0 foot per second?

☐ Yes ☒ No

|                            |      |                                                        |  |
|----------------------------|------|--------------------------------------------------------|--|
| Percentage of existing     | 0.00 | Acres of impervious area draining to a vegetated swale |  |
| Percentage of the proposed | 0.00 | Acres of impervious area draining to a vegetated swale |  |

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### Rain Barrel/Cistern Credit Worksheet

Please fill out a rain barrel/cistern worksheet for each project sub-watershed.

| Rain Barrel/Cistern Credit Criteria                              |  | Response |
|------------------------------------------------------------------|--|----------|
| Total number of rain barrel(s)/cisterns                          |  |          |
| Average capacity of rain barrel(s)/cistern(s) (in gallons)       |  |          |
| Total capacity rain barrel(s)/cistern(s) (in cu ft) <sup>1</sup> |  | 0        |

<sup>1</sup> accounts for 10% loss

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Please fill out a soil quality worksheet for each project sub-watershed.

|                                                                                                                                                                                                                                                                            | Response                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Will the landscaped area be lined with an impervious membrane?                                                                                                                                                                                                             |                                                               |
| Will the soils used for landscaping meet the ideal bulk densities listed in Table 1 below? <sup>1</sup>                                                                                                                                                                    | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| If you answered yes to the question above, and you know the area-weighted bulk density within the top 12 inches for soils used for landscaping (in g/cm <sup>3</sup> )*, fill in the cell to the right and skip to cell G11. If not select from the drop-down menu in G10. | 1.3                                                           |
| If you answered yes to the question above, but you do not know the exact bulk density, which of the soil types in the drop down menu to the right best describes the top 12 inches for soils used for landscaping (in g/cm <sup>3</sup> ).                                 | Sandy loams, loams                                            |
| What is the average depth of your landscaped soil media meeting the above criteria (inches)?                                                                                                                                                                               | 12                                                            |
| What is the total area of the landscaped areas meeting the above criteria (in acres)?                                                                                                                                                                                      | 2.97                                                          |

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Table 1

|                                                         |      |
|---------------------------------------------------------|------|
| Sands, loamy sands                                      | <1.6 |
| Sandy loams, loams                                      | <1.4 |
| Sandy clay loams, loams, clay loams                     | <1.4 |
| Silts, silt loams                                       | <1.3 |
| Silt loams, silty clay loams                            | <1.1 |
| Sandy clays, silty clays, some clay loams (35-45% clay) | <1.1 |
| Clays (>45% clay)                                       | <1.1 |

Porosity (%) 50.94%

Mineral grains in many soils are mainly quartz and feldspar, so 2.65 a good average for particle density. To determine percent porosity, use the formula: Porosity (%) = (1-Bulk Density/2.65) X 100

<sup>1</sup> USDA NRCS. "Soil Quality Urban Technical Note No.2-Urban Soil Compaction". March 2000.

[http://soils.usda.gov/sqi/management/files/sq\\_utn\\_2.pdf](http://soils.usda.gov/sqi/management/files/sq_utn_2.pdf)

\* To determine how to calculate density see:

<http://www.globe.gov/tctg/bulkden.pdf?sectionID=94>

## APPENDIX 3

### Bioassessment Monitoring Guidelines

Bioassessment monitoring is required for projects that meet all of the following criteria:

1. The project is rated Risk Level 3 or LUP Type 3
2. The project directly discharges runoff to a freshwater wadeable stream (or streams) that is either: (a) listed by the State Water Board or USEPA as impaired due to sediment, and/or (b) tributary to any downstream water body that is listed for sediment; and/or have the beneficial use SPAWN & COLD & MIGRATORY
3. Total project-related ground disturbance exceeds 30 acres.

For all such projects, the discharger shall conduct bioassessment monitoring, as described in this section, to assess the effect of the project on the biological integrity of receiving waters.

Bioassessment shall include:

1. The collection and reporting of specified instream biological data
2. The collection and reporting of specified instream physical habitat data

#### Bioassessment Exception

If a site qualifies for bioassessment, but construction commences out of an index period for the site location, the discharger shall:

1. Receive Regional Water Board approval for the sampling exception
2. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.
3. Send a copy of the check to the Regional Water Board office for the site's region
4. Invest **7,500.00 X The number of samples required** into the SWAMP program as compensation (upon Regional Water Board approval).
5. Conduct bioassessment monitoring, as described in Appendix 4
6. Include the collection and reporting of specified instream biological data and physical habitat
7. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP)

#### Site Locations and Frequency

Macroinvertebrate samples shall be collected both before ground disturbance is initiated and after the project is completed. The "after" sample(s) shall be collected after at least one winter season resulting in surface runoff has transpired after project-related ground disturbance has ceased. "Before" and "after" samples shall be collected both upstream and downstream of the project's

discharge. Upstream samples should be taken immediately before the sites outfall and downstream samples should be taken immediately after the outfall (when safe to collect the samples). Samples should be collected for each freshwater Wadeable Stream that is listed as impaired due to sediment, or tributary to a water body that is listed for sediment. Habitat assessment data shall be collected concurrently with all required macroinvertebrate samples.

#### Index Period (Timing of Sample Collection)

Macroinvertebrate sampling shall be conducted during the time of year (i.e., the “index period”) most appropriate for bioassessment sampling, depending on ecoregion. This map is posted on the State Water Board’s Website:  
[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml)

#### Field Methods for Macroinvertebrate Collections

In collecting macroinvertebrate samples, the discharger shall use the “Reachwide Benthos (Multi-habitat) Procedure” specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).<sup>1</sup>

#### Physical - Habitat Assessment Methods

The discharger shall conduct, concurrently with all required macroinvertebrate collections, the “Full” suite of physical habitat characterization measurements as specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007), and as summarized in the Surface Water Ambient Monitoring Program’s *Stream Habitat Characterization Form — Full Version*.

#### Laboratory Methods

Macroinvertebrates shall be identified and classified according to the Standard Taxonomic Effort (STE) Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),<sup>2</sup> and using a fixed-count of 600 organisms per sample.

#### Quality Assurance

The discharger or its consultant(s) shall have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan shall include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

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<sup>1</sup> This document is available on the Internet at: [http://www.swrcb.ca.gov/swamp/docs/phab\\_sopr6.pdf](http://www.swrcb.ca.gov/swamp/docs/phab_sopr6.pdf).  
[http://swamp.mpsl.mml.calstate.edu/wp-content/uploads/2009/04/swamp\\_sop\\_bioassessment\\_collection\\_020107.pdf](http://swamp.mpsl.mml.calstate.edu/wp-content/uploads/2009/04/swamp_sop_bioassessment_collection_020107.pdf).

<sup>2</sup> The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: [http://www.swrcb.ca.gov/swamp/docs/safit/ste\\_list.pdf](http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf)  
[http://www.safit.org/Docs/ste\\_list.pdf](http://www.safit.org/Docs/ste_list.pdf). When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board’s SWAMP website.



errors are identified). External QA checks shall be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by State Water Board staff.

#### Sample Preservation and Archiving

The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). The identified organisms shall be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and shall be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms shall be relinquished to the State Water Board upon request by any State Water Board staff.

#### Data Submittal

The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) shall be submitted to the State Water Board in electronic format. The State Water Board's Surface Water Ambient Monitoring Program (SWAMP) is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available shall be submitted using the SWAMP formats. Until those formats are available, the biological data shall be submitted in MS-Excel (or equivalent) format.<sup>3</sup>

The physical/habitat data shall be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.<sup>4</sup>

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<sup>3</sup> Any version of Excel, 2000 or later, may be used.

<sup>4</sup> Available at:

[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/docs/reports/fieldforms\\_fullversion052908.pdf](http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf)

### Invasive Species Prevention

In conducting the required bioassessment monitoring, the discharger and its consultants shall take precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the discharger and its consultants shall follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.<sup>5</sup>

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<sup>5</sup> Instructions for controlling the spread of NZ mudsnails, including decontamination methods, can be found at: <http://www.dfg.ca.gov/invasives/mudsnail/>  
More information on AIS More information on AIS  
[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/ais/](http://www.waterboards.ca.gov/water_issues/programs/swamp/ais/)

### Appendix 4 Non Sediment TMDLs

#### Region 1 Lost River-DIN and CBOD

| Region 1<br>Source: Cal Trans<br>Construction<br>TMDL Completion Date: 12<br>30 2008<br>TMDL Type: River, Lake<br>Watershed Area= 2996 mi <sup>2</sup> | Pollutant Stressors/WLA                                   |                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------|
|                                                                                                                                                        | Dissolved inorganic<br>nitrogen (DIN)<br>(metric tons/yr) | Carbonaceous biochemical oxygen<br>demand (CBOD)<br>(metric tons/yr) |
| Lost River from the Oregon<br>border to Tule Lake                                                                                                      | .1                                                        | .2                                                                   |
| Tule Lake Refuge                                                                                                                                       | .1                                                        | .2                                                                   |
| Lower Klamath Refuge                                                                                                                                   | .1                                                        | .2                                                                   |

#### Region 2 San Francisco Bay-Mercury

| Region 2<br>Source: Non-Urban<br>Stormwater Runoff<br>TMDL Type: Bay | Name                    | Pollutant<br>Stressor/WLA | TMDL<br>Completion Date |
|----------------------------------------------------------------------|-------------------------|---------------------------|-------------------------|
|                                                                      | San<br>Francisco<br>Bay | Mercury 25 kg/year        | 08 09 2006              |

#### Region 4 Ballona Creek-Metals and Selenium

| Region 4<br>Source: NPDES<br>General Construction<br>TMDL Completion<br>Date: 12 22 2005<br>TMDL Type: Creek | Pollutant Stressors/WLA                 |                                         |                                         |                                         |                                         |                                         |                                         |                                         |
|--------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
|                                                                                                              | Copper (Cu)                             |                                         | Lead (Pb)                               |                                         | Selenium (Se)                           |                                         | Zinc (Zn)                               |                                         |
|                                                                                                              | g/day                                   | g/day/acre                              | g/day                                   | g/day/acre                              | g/day                                   | g/day/acre                              | g/day                                   | g/day/acre                              |
| Ballona Creek                                                                                                | 4.94E-07 x<br>Daily storm<br>volume (L) | 2.20E-10 x<br>Daily storm<br>volume (L) | 1.62E-06 x<br>Daily storm<br>volume (L) | 7.20E-10 x<br>Daily storm<br>volume (L) | 1.37E-07 x<br>Daily storm<br>volume (L) | 6.10E-11 x<br>Daily storm<br>volume (L) | 3.27E-06 x<br>Daily storm<br>volume (L) | 1.45E-09 x<br>Daily storm<br>volume (L) |

**General Construction Storm Water Permits:**

Waste load allocations will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

- Dry-weather Implementation Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order No. 99-08 DWQ), or any successor order, are exempt from the dry-weather waste load allocation equal to zero as long as they comply with the provisions of sections C.3 and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be:
  - (1) infeasible to eliminate
  - (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and
  - (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order.
 Unauthorized non-storm water flows are already prohibited by Order No. 99-08 DWQ.
- Wet-weather Implementation Within seven years of the effective date of the TMDL, the construction industry will submit the results of BMP effectiveness studies to determine BMPs that will achieve compliance with the final waste load allocations assigned to construction storm water permittees.
- Regional Board staff will bring the recommended BMPs before the Regional Board for consideration within eight years of the effective date of the TMDL.
- General construction storm water permittees will be considered in compliance with final waste load allocations if they implement these Regional Board approved BMPs. All permittees must implement the approved BMPs within nine years of the effective date of the TMDL. If no effectiveness studies are conducted and no BMPs are approved by the Regional Board within eight years of the effective date of the TMDL, each general construction storm water permit holder will be subject to site-specific BMPs and monitoring requirements to demonstrate compliance with final waste load allocations.

**Region 4 Calleguas Creek-OC Pesticides, PCBs, and Siltation****Interim Requirements**

| <b>Region 4 Calleguas Creek</b><br>Source: Minor NPDES point sources/WDRs<br>TMDL Completion Date: 3 14 2006<br>TMDL Type:Creek | <b>Pollutant Stressor</b> | <b>WLA Daily Max (µg/L)</b> | <b>WLA Monthly Ave (µg/L)</b> |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------|-------------------------------|
|                                                                                                                                 | Chlordane                 | 1.2                         | 0.59                          |
|                                                                                                                                 | 4,4-DDD                   | 1.7                         | 0.84                          |
|                                                                                                                                 | 4,4-DDE                   | 1.2                         | 0.59                          |
|                                                                                                                                 | 4,4-DDT                   | 1.2                         | 0.59                          |
|                                                                                                                                 | Dieldrin                  | 0.28                        | 0.14                          |
|                                                                                                                                 | PCB's                     | 0.34                        | 0.17                          |
|                                                                                                                                 | Toxaphene                 | 0.33                        | 0.16                          |

| Final WLA (ng/g)                                                                                                       |           |         |         |         |          |         |           |
|------------------------------------------------------------------------------------------------------------------------|-----------|---------|---------|---------|----------|---------|-----------|
| <b>Region 4 Calleguas Creek</b><br>Source: Stormwater Permittees<br>TMDL Completion Date: 3 14 2006<br>TMDL Type:Creek | Chlordane | 4,4-DDD | 4,4-DDE | 4,4-DDT | Dieldrin | PCB's   | Toxaphene |
| Mugu Lagoon*                                                                                                           | 3.3       | 2.0     | 2.2     | 0.3     | 4.3      | 180.0   | 360.0     |
| Callegaus Creek                                                                                                        | 3.3       | 2.0     | 1.4     | 0.3     | 0.2      | 120.0   | 0.6       |
| Revolon Slough (SW)*                                                                                                   | 0.9       | 2.0     | 1.4     | 0.3     | 0.1      | 130.0   | 1.0       |
| Arroyo Las posas(SW)*                                                                                                  | 3.3       | 2.0     | 1.4     | 0.3     | 0.2      | 120.0   | 0.6       |
| Arroyo Simi                                                                                                            | 3.3       | 2.0     | 1.4     | 0.3     | 0.2      | 120.0   | 0.6       |
| Conejo Creek                                                                                                           | 3.3       | 2.0     | 1.4     | 0.3     | 0.2      | 120.0   | 0.6       |
| Interim Requirements (ng/g)                                                                                            |           |         |         |         |          |         |           |
| Mugu Lagoon*                                                                                                           | 25.0      | 69.0    | 300.0   | 39.0    | 19.0     | 180.    | 22900.0   |
| Callegaus Creek                                                                                                        | 17.0      | 66.0    | 470.0   | 110.0   | 3.0      | 3800.0  | 260.0     |
| Revolon Slough (SW)*                                                                                                   | 48.0      | 400.0   | 1600.0  | 690.0   | 5.7      | 7600.0  | 790.0     |
| Arroyo Las posas(SW)*                                                                                                  | 3.3       | 290.0   | 950.0   | 670.0   | 1.1      | 25700.0 | 230.0     |
| Arroyo Simi                                                                                                            | 3.3       | 14.0    | 170.0   | 25.0    | 1.1      | 25700.0 | 230.0     |
| Conejo Creek                                                                                                           | 3.4       | 5.3     | 20.0    | 2.0     | 3.0      | 3800.0  | 260.0     |

\*(SW)=Subwatershed

\*Mugu Lagoon includes Duck pond/Agricultural Drain/Mugu/Oxnard Drain #2

Compliance with sediment based WLAs is measured as an instream annual average at the base of each subwatershed where the discharges are located.

#### Region 4 Calleguas Creek-Salts

| Final Dry Weather Pollutant WLA (mg/L)                                                                                           |                                                       |                              |                         |                             |                           |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------|-------------------------|-----------------------------|---------------------------|
| <b>Region 4 Calleguas Creek</b><br>Source Permitted Stormwater Dischargers TMDL<br>Completion Date: 12 2 2008<br>TMDL Type:Creek | <b>Critical<br/>Condition<br/>Flow Rate<br/>(mgd)</b> | <b>Chloride<br/>(lb/day)</b> | <b>TDS<br/>(lb/day)</b> | <b>Sulfate<br/>(lb/day)</b> | <b>Boron<br/>(lb/day)</b> |
| Simi                                                                                                                             | 1.39                                                  | 1738.0                       | 9849.0                  | 2897.0                      | 12.0                      |
| Las Posas                                                                                                                        | 0.13                                                  | 157.0                        | 887.0                   | 261.0                       | N/A                       |
| Conejo                                                                                                                           | 1.26                                                  | 1576.0                       | 8931.0                  | 2627.0                      | N/A                       |

|                                                 |                        |                   |                       |                     |     |
|-------------------------------------------------|------------------------|-------------------|-----------------------|---------------------|-----|
| Camarillo                                       | 0.06                   | 72.0              | 406.0                 | 119.0               | N/A |
| Pleasant Valley (Calleguas)                     | 0.12                   | 150.0             | 850.0                 | 250.0               | N/A |
| Pleasant Valley (Revolon)                       | 0.25                   | 314.0             | 1778.0                | 523.0               | 2.0 |
| <b>Dry Weather Interim Pollutant WLA (mg/L)</b> |                        |                   |                       |                     |     |
|                                                 | <b>Chloride (mg/L)</b> | <b>TDS (mg/L)</b> | <b>Sulfate (mg/L)</b> | <b>Boron (mg/L)</b> |     |
| Simi                                            | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |
| Las Posas                                       | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |
| Conejo                                          | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |
| Camarillo                                       | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |
| Pleasant Valley (Calleguas)                     | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |
| Pleasant Valley (Revolon)                       | 230.0                  | 1720.0            | 1289.0                | 1.3                 |     |

- General Construction permittees are assigned a dry weather wasteload allocation equal to the average dry weather critical condition flow rate multiplied by the numeric target for each constituent. Waste load allocations apply in the receiving water at the base of each subwatershed. Dry weather allocations apply when instream flow rates are below the 86th percentile flow and there has been no measurable precipitation in the previous 24 hours.
- Because wet weather flows transport a large mass of salts at low concentrations, these dischargers meet water quality objectives during wet weather.
- Interim limits are assigned for dry weather discharges from areas covered by NPDES stormwater permits to allow time to implement appropriate actions. The interim limits are assigned as concentration based receiving water limits set to the 95th percentile of the discharger data as a monthly average limit except for chloride. The 95th percentile for chloride was 267 mg/L which is higher than the recommended criteria set forth in the Basin Plan for protection of sensitive beneficial uses including aquatic life. Therefore, the interim limit for chloride for Permitted Stormwater Dischargers is set equal to 230 mg/L to ensure protection of sensitive beneficial uses in the Calleguas Creek watershed.

#### **Region 4 San Gabriel River and Tributaries-Metals and Selenium**

|                                                                                                                                                      |                           |                                |                                |                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------|--------------------------------|-----------------------|
| <b>Region 4 San Gabriel River and Tributaries</b><br>Source: Construction Stormwater Dischargers<br>TMDL Completion Date: 3 2007<br>TMDL Type: Creek | <b>Pollutant Stressor</b> | <b>Wet weather Allocations</b> | <b>Dry Weather Allocations</b> | <b>% of Watershed</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------|--------------------------------|-----------------------|

|                              |                         |                                      |        |      |
|------------------------------|-------------------------|--------------------------------------|--------|------|
| San Gabriel Reach 2          | Lead (Pb)               | 0.7% * 166 µg/l *<br>Daily Storm Vol | N/A    | 0.7% |
| San Gabriel Reach 2          | Lead (Pb)<br>Mass based | 0.8 kg/d                             | N/A    | 0.7% |
| Coyote Creek                 | Copper (Cu)             | 0.285 kg/d                           | 0      | 5.0% |
| Coyote Creek                 | Lead (Pb)               | 1.70 kg/d                            | N/A    | 5.0% |
| Coyote Creek                 | Zinc (Zn)               | 2.4 kg/d                             | N/A    | 5.0% |
| San Jose Creek Reach 1 and 2 | Selenium                | 5 µg/L                               | 5 µg/L | 5.0% |

Wet-weather allocations for lead in San Gabriel River Reach 2. Concentration-based allocations apply to non-stormwater NPDES discharges. Stormwater allocations are expressed as a percent of load duration curve. Mass-based values presented in table are based on a flow of 260 cfs (daily storm volume =  $6.4 \times 10^8$  liters).

There are 1555 acres of water in the entire watershed, 37.4 acres of water in the Reach 1 subwatershed (2.4%), and 269 acres in the Coyote Creek subwatershed (17%).

### **General Construction Storm Water Permits**

Waste load allocations for the general construction storm water permits may be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board. An estimate of direct atmospheric deposition is developed based on the percent area of surface water in the watershed. Approximately 0.4% of the watershed area draining to San Gabriel River Reach 2 is comprised of water and approximately 0.2% of the watershed area draining to Coyote Creek is comprised of water.

### **Region 4 The Harbor Beaches of Ventura County-Bacteria**

The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. Bacteriological objectives are set forth in Chapter 3 of the Basin Plan. The objectives are based on four bacteria indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:

The General NPDES Construction permit is seen as a minor contributor and is given no allocation

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Channel Islands Harbor subwatershed are assigned WLAs of zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, individual NPDES permit, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR will also be subject to a WLA of zero (0) days of allowable exceedances.

#### **Region 4 Resolution No. 03-009 Los Angeles River and Tributaries-Nutrients**

##### **Minor Point Sources**

Waste loads are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia WRP, Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction stormwater, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s)

| <b>Region 4</b><br>Minor Point Sources for<br>NPDES/WDR Permits<br>TMDL Completion Date: 7 10<br>2003<br><br>TMDL Type: River | Pollutant Stressor/WLA                |                    |                                                |                                                |                                            |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------|------------------------------------------------|------------------------------------------------|--------------------------------------------|
|                                                                                                                               | <b>Total Ammonia (NH<sub>3</sub>)</b> |                    | <b>Nitrate-nitrogen<br/>(NO<sub>3</sub>-N)</b> | <b>Nitrite-nitrogen<br/>(NO<sub>2</sub>-N)</b> | <b>NO<sub>3</sub>-N + NO<sub>2</sub>-N</b> |
|                                                                                                                               | 1 Hr Ave<br>mg/l                      | 30 Day Ave<br>mg/l | 30 Day Ave mg/l                                |                                                | 30 Day Ave mg/l                            |
| LA River Above Los Angeles-Glendale WRP (LAG)                                                                                 | 4.7                                   | 1.6                | 8.0                                            | 1.0                                            | 8.0                                        |
| LA River Below LAG                                                                                                            | 8.7                                   | 2.4                | 8.0                                            | 1.0                                            | 8.0                                        |
| Los Angeles Tributaries                                                                                                       | 10.1                                  | 2.3                | 8.0                                            | 1.0                                            | 8.0                                        |

#### **Malibu Creek Attachment A to Resolution No. 2004-019R-Bacteria**

12 13 2004 The WLAs for permittees under the NPDES General Stormwater Construction Permit are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.

#### **Region 4 Marina del Rey Harbor, Mothers' Beach and Back Basins**



**Attachment A to Resolution No. 2003-012-Bacteria**

8 7 2003 As discussed in "Source Analysis", discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the MdR Watershed will also be subject to a WLA of zero days of allowable exceedances.

**Region 4 San Gabriel River and Tributaries-Metals and Selenium**

**Dry Weather Selenium WLA**

A zero WLA is assigned to the industrial and construction stormwater permits during dry weather. Non-storm water discharges are already prohibited or restricted by existing general permits.

| <b>Region 4</b><br>General Construction Permittees<br>TMDL Completion Date: 7 13 2006<br>TMDL Type: River | <b>Total Recoverable Metals (kg/day)</b> |                                   |                                  |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------|----------------------------------|
|                                                                                                           | <b>Copper (Cu)<br/>Kg/day</b>            | <b>Lead (Pb)<br/>Kg/day</b>       | <b>Zinc (Zn)<br/>Kg/day</b>      |
| San Gabriel River Reach 2 and upstream reaches/tributaries                                                | <b>XXXX</b>                              | Daily storm volume x 1.24<br>µg/L | <b>XXXX</b>                      |
| Coyote Creek and Tributaries                                                                              | Daily storm volume x 0.7<br>µg/L         | Daily storm volume x 4.3<br>µg/L  | Daily storm volume x 6.2<br>µg/L |

Each enrollee under the general construction stormwater permit receives a WLA on a per acre basis

| <b>Region 4</b><br>General Construction Permittees TMDL<br>Completion Date: 7 13 2006<br>TMDL Type: River | <b>Total Recoverable Metals (kg/day/acre)</b> |                                   |                                  |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------|
|                                                                                                           | <b>Copper (Cu)<br/>Kg/acre/day</b>            | <b>Lead (Pb)<br/>Kg/acre/day</b>  | <b>Zinc (Zn)<br/>Kg/acre/day</b> |
| San Gabriel River Reach 2 and upstream reaches/tributaries                                                | <b>XXXX</b>                                   | Daily storm volume x 0.56<br>µg/L | <b>XXXX</b>                      |

|                              |                                   |                                   |                                   |
|------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Coyote Creek and Tributaries | Daily storm volume x 0.12<br>µg/L | Daily storm volume x 0.70<br>µg/L | Daily storm volume x 1.01<br>µg/L |
|------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|

For the general industrial and construction storm water permits, the daily storm volume is measured at USGS station 11085000 for discharges to Reach 2 and above and at LACDPW flow gauge station F354-R for discharges to Coyote Creek.

### **General construction storm water permits**

WLAs will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

### **Dry-weather implementation**

Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (NPDES Permit No. CAS000002), or any successor permit, are exempt from the dry-weather WLA equal to zero as long as they comply with the provisions of sections C.3. and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be (1) infeasible to eliminate (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order. Unauthorized non-storm water flows are already prohibited by Permit No. CAS000002.

### **Upon permit issuance, renewal, or re-opener**

Non-storm water flows not authorized by Order No. 99-08 DWQ, or any successor order, shall achieve dry-weather WLAs. WLAs shall be expressed as NPDES water quality-based effluent limitations specified in accordance with federal regulations and state policy on water quality control. Effluent limitations may be expressed as permit conditions, such as the installation, maintenance, and monitoring of Regional Board-approved BMPs.

### **Six years from the effective date of the TMDL**

The construction industry will submit the results of wet-weather BMP effectiveness studies to the Los Angeles Regional Board for consideration. In the event that no effectiveness studies are conducted and no BMPs are approved, permittees shall be subject to site-specific BMPs and monitoring to demonstrate BMP effectiveness.

### **Seven years from the effective date of the TMDL**

The Los Angeles Regional Board will consider results of the wet weather BMP effectiveness studies and consider approval of BMPs.

### **Eight years from the effective date of the TMDL**

All general construction storm water permittees shall implement Regional Board-approved BMPs.

## **Region 8 RESOLUTION NO. R8-2007- 0024**

Total Maximum Daily Loads (TMDLs) for San Diego Creek,  
Upper and Lower Newport Bay, Orange County, California

| <b>Region 8</b><br>NPDES Construction Permit<br>TMDL Completion Date: 1 24 1995<br><br>TMDL Type: River. Cr, Bay | Organochlorine Compounds |      |           |       |            |       |           |      |
|------------------------------------------------------------------------------------------------------------------|--------------------------|------|-----------|-------|------------|-------|-----------|------|
|                                                                                                                  | Total DDT                |      | Chlordane |       | Total PCBs |       | Toxaphene |      |
|                                                                                                                  | g/day                    | g/yr | g/day     | g/yr  | g/day      | g/yr  | g/day     | g/yr |
| San Diego Creek                                                                                                  | .27                      | 99.8 | .18*      | 64.3* | .09*       | 31.5* | .004      | 1.5  |
| Upper Newport Bay                                                                                                | .11                      | 40.3 | .06       | 23.4  | .06        | 23.2  | X         | X    |
| Lower Newport Bay                                                                                                | .04                      | 14.9 | .02       | 8.6   | .17        | 60.7  | X         | X    |

\*Red= Informational WLA only, not for enforcement purposes

### Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by *(the date of OAL approval of this BPA)*. **No later than two months** from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but **no later than (three months of completion of the SWPPP Improvement Program)**. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

### Appendix 4 Sediment TMDLs

Implemented Sediment TMDLs in California. Construction was listed as a source in all fo these TMDLs in relation to road construction. Although construction was mentioned as a source, it was not given a specific allocation amount. The closest allocation amount would be for the road activity management WLA. **Implementation Phase** – Adoption process by the Regional Board, the State Water Resources Control Board, the Office of Administrative Law, and the US Environmental Protection Agency completed and TMDL being implemented.

| A. Region                   | Type | Name         | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres | WLA tons mi <sup>2</sup> yr |
|-----------------------------|------|--------------|--------------------|-------------------|----------------------|-----------------|-----------------------------|
| 1<br>R1.epa.albionfinaltmdl | R    | Albion River | Sedimentation      | Road Construction | 2001                 | 43 acres        | See A (table 6)             |

| B Region                          | Type | Name                                                                    | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres     | WLA tons mi <sup>2</sup> yr |
|-----------------------------------|------|-------------------------------------------------------------------------|--------------------|-------------------|----------------------|---------------------|-----------------------------|
| 1 R1.epa.EelR-middle.mainSed.temp | R    | Middle Main Eel River and Tributaries (from Dos Rios to the South Fork) | Sedimentation      | Road Construction | 2005-2006            | 521 mi <sup>2</sup> | 100                         |

| C Region                       | Type | Name                 | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres | WLA tons mi <sup>2</sup> yr |
|--------------------------------|------|----------------------|--------------------|-------------------|----------------------|-----------------|-----------------------------|
| 1<br>R1.epa.EelRsouth.sed.temp | R    | South Fork Eel River | Sedimentation      | Road Construction | 12 1999              | See chart       | 473                         |

| D Region                 | Type | Name      | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres                        | WLA tons mi <sup>2</sup> yr                               |
|--------------------------|------|-----------|--------------------|-------------------|----------------------|----------------------------------------|-----------------------------------------------------------|
| 1<br>R1.epa.bigfinaltmdl | R    | Big River | Sedimentation      | Road Construction | 12 2001              | 181 mi <sup>2</sup> watershed drainage | TMDL = loading capacity = nonpoint sources + background = |

## APPENDIX 4

|  |  |  |  |  |  |  |                          |
|--|--|--|--|--|--|--|--------------------------|
|  |  |  |  |  |  |  | 393 t mi <sup>2</sup> yr |
|--|--|--|--|--|--|--|--------------------------|

| <b>E Region</b>                            | <b>Type</b> | <b>Name</b>     | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres</b>    | <b>WLA tons mi<sup>2</sup> yr</b> |
|--------------------------------------------|-------------|-----------------|---------------------------|--------------------------|-----------------------------|---------------------------|-----------------------------------|
| 1 R1.epa.EelR-lower.Sed.temp-121807-signed | R           | Lower Eel River | Sedimentation             | Road Construction        | 12 2007                     | 300 square-mile watershed | 898                               |

| <b>F Region</b>                | <b>Type</b> | <b>Name</b>           | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres</b>                      | <b>WLA tons mi<sup>2</sup> yr</b> |
|--------------------------------|-------------|-----------------------|---------------------------|--------------------------|-----------------------------|---------------------------------------------|-----------------------------------|
| 1 R1.epa.EelR-middle.Sed.temp- | R           | Middle Fork Eel River | Sedimentation             | Road Construction        | 12 2003                     | 753 mi <sup>2</sup> (approx. 482,000 acres) | 82                                |

| <b>G Region</b>                                 | <b>Type</b> | <b>Name</b>          | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres Mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|-------------------------------------------------|-------------|----------------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1 R1.epa.EelRnorth-Sed.temp.final-121807-signed | R           | North Fork Eel River | Sedimentation             | Road Construction        | 12 30 2002                  | 289 (180,020 acres)                   | 20                                |

| <b>H Region</b>                  | <b>Type</b> | <b>Name</b>                                                                                   | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres Mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|----------------------------------|-------------|-----------------------------------------------------------------------------------------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1 R1.epa.EelR-upper.mainSed.tem- | R           | Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury) | Sedimentation             | Road Construction        | 12 29 2004                  | 688 (approx. 440,384 acres)           | 14                                |

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| <b>I Region</b>                  | <b>Type</b> | <b>Name</b>   | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres</b>    | <b>WLA tons mi<sup>2</sup> yr</b> |
|----------------------------------|-------------|---------------|---------------------------|--------------------------|-----------------------------|---------------------------|-----------------------------------|
| 1<br>R1.epa.gualalafina<br>ltmdl | R           | Gualala River | Sedimentation             | Road Construction        | Not sure                    | 300<br>(191,145<br>acres) | 7                                 |

| <b>J Region</b>                | <b>Type</b> | <b>Name</b> | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|--------------------------------|-------------|-------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1 R1.epa.Mad-<br>sed.turbidity | R           | Mad River   | Sedimentation             | Road<br>Construction     | 12 21 2007                  | 480                                   | 174                               |

| <b>K Region</b>                  | <b>Type</b> | <b>Name</b>   | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|----------------------------------|-------------|---------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1<br>R1.epa.mattole.se<br>diment | R           | Mattole River | Sedimentation             | Road<br>Construction     | 12 30 2003                  | 296                                   | 27 or<br>520+27 = 547             |

| <b>L Region</b>                  | <b>Type</b> | <b>Name</b>   | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|----------------------------------|-------------|---------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1<br>R1.epa.navarro.se<br>d.temp | R           | Navarro River | Sedimentation             | Road Construction        | Not sure                    | 315 (201,600<br>acres).               | 50                                |

| <b>M Region</b>               | <b>Type</b> | <b>Name</b> | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b>                          |
|-------------------------------|-------------|-------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|------------------------------------------------------------|
| 1<br>R1.epa.noyo.sedi<br>ment | R           | Noyo River  | Sedimentation             | Road<br>Construction     | 12 16 1999                  | 113 (72,323 acres)                    | 68 (three<br>areas<br>measured)<br>Table 16 in<br>the TMDL |

| <b>N Region</b>           | <b>Type</b> | <b>Name</b>   | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|---------------------------|-------------|---------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-----------------------------------|
| 1<br>R1.epa.RedwoodCk.sed | Cr          | Redwood Creek | Sedimentation             | Road Construction        | 12 30 1998                  | 278                                   | 1900<br>Total allocation          |

| <b>O Region</b>         | <b>Type</b> | <b>Name</b>    | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA – Roads tons mi<sup>2</sup> yr</b> |
|-------------------------|-------------|----------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|-------------------------------------------|
| 1<br>R1.epa.tenmile.sed | R           | Ten Mile River | Sedimentation             | Road Construction        | 2000                        | 120                                   | 9                                         |

| <b>P Region</b>         | <b>Type</b> | <b>Name</b>                     | <b>Pollutant Stressor</b> | <b>Potential Sources</b> | <b>TMDL Completion Date</b> | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA management tons mi<sup>2</sup> yr</b> |
|-------------------------|-------------|---------------------------------|---------------------------|--------------------------|-----------------------------|---------------------------------------|----------------------------------------------|
| 1<br>R1.epa.trinity.sed | R           | Trinity River                   | Sedimentation             | Road Construction        | 12 20 2001                  | 2000 of 3000 covered in this TMDL     | See rows below                               |
| 1                       | Cr          | Horse Linto Creek               | Sedimentation             | Road Construction        | 12 20 2001                  | 64                                    | 528                                          |
| 1                       | Cr          | Mill creek and Tish Tang        | Sedimentation             | Road Construction        | 12 20 2001                  | 39                                    | 210                                          |
| 1                       | Cr          | Willow Creek                    | Sedimentation             | Road Construction        | 12 20 2001                  | 43                                    | 94                                           |
| 1                       | Cr          | Campbell Creek and Supply Creek | Sedimentation             | Road Construction        | 12 20 2001                  | 11                                    | 1961                                         |
| 1                       | Cr          | Lower Mainstem and Coon Creek   | Sedimentation             | Road Construction        | 12 20 2001                  | 32                                    | 63                                           |
| 1                       | R           | Reference                       | Sedimentation             | Road                     | 12 20 2001                  | 434                                   | 24                                           |

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|   |          | Subwatershed <sup>1</sup>                    |               | Construction      |            |     |     |
|---|----------|----------------------------------------------|---------------|-------------------|------------|-----|-----|
| 1 | Cr       | Canyon Creek                                 | Sedimentation | Road Construction | 12 20 2001 | 64  | 326 |
| 1 | R        | Upper Tributaries <sup>2</sup>               | Sedimentation | Road Construction | 12 20 2001 | 72  | 67  |
| 1 | R        | Middle Tributaries <sup>3</sup>              | Sedimentation | Road Construction | 12 20 2001 | 54  | 53  |
| 1 | R        | Lower Tributaries <sup>4</sup>               | Sedimentation | Road Construction | 12 20 2001 | 96  | 55  |
| 1 | Cr       | Weaver and Rush Creeks                       | Sedimentation | Road Construction | 12 20 2001 | 72  | 169 |
| 1 | Cr       | Deadwood Creek<br>Hoadley Gulch<br>Poker Bar | Sedimentation | Road Construction | 12 20 2001 | 47  | 68  |
| 1 | L        | Lewiston Lake                                | Sedimentation | Road Construction | 12 20 2001 | 25  | 49  |
| 1 | Cr       | Grassvalley Creek                            | Sedimentation | Road Construction | 12 20 2001 | 37  | 44  |
| 1 | Cr       | Indian Creek                                 | Sedimentation | Road Construction | 12 20 2001 | 34  | 81  |
| 1 | Cr       | Reading and Browns Creek                     | Sedimentation | Road Construction | 12 20 2001 | 104 | 66  |
| 1 | Cr       | Reference Subwatersheds <sup>5</sup>         | Sedimentation | Road Construction | 12 20 2001 | 235 | 281 |
| 1 | L, Cr    | Westside tributaries <sup>6</sup>            | Sedimentation | Road Construction | 12 20 2001 | 93  | 105 |
| 1 | R, Cr, G | Upper trinity <sup>7</sup>                   | Sedimentation | Road Construction | 12 20 2001 | 161 | 690 |
| 1 | R, Cr, G | East Fork Tributaries <sup>8</sup>           | Sedimentation | Road Construction | 12 20 2001 | 115 | 65  |

1

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## APPENDIX 4

|   |      |                                   |               |                   |            |    |    |
|---|------|-----------------------------------|---------------|-------------------|------------|----|----|
| 1 | R, L | Eastside Tributaries <sup>9</sup> | Sedimentation | Road Construction | 12 20 2001 | 89 | 60 |
|---|------|-----------------------------------|---------------|-------------------|------------|----|----|

1 New River, Big French, Manzanita, North Fork, East Fork, North Fork

2 Dutch, Soldier, Oregon gulch, Conner Creek

3 Big Bar, Prairie Creek, Little French Creek

4 Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quimby, Hawkins, Sharber

5 Stuarts Fork, Swift Creek, Coffee Creek

6 Stuart Arm, Stoney Creek, Mule Creek, East Fork, Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek,

7 Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstream, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowslide Gulch, Scorpion Creek

8 East Fork Trinity, Cedar Creek, Squirrel Gulch

9 East Side Tributaries, Trinity Lake

| Q Region                   | Type  | Name                                       | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres mi <sup>2</sup> | WLA tons mi <sup>2</sup> yr |
|----------------------------|-------|--------------------------------------------|--------------------|-------------------|----------------------|---------------------------------|-----------------------------|
| 1<br>R1.epa.trinity.so.sed | R, Cr | South Fork Trinity River and Hayfork Creek | Sedimentation      | Road Construction | 12 1998              | Not given, 19 miles long        | 33 (road total)             |

| R Region                 | Type  | Name                            | Pollutant Stressor | Potential Sources | TMDL Completion Date | Watershed Acres mi <sup>2</sup> | WLA tons mi <sup>2</sup> yr |
|--------------------------|-------|---------------------------------|--------------------|-------------------|----------------------|---------------------------------|-----------------------------|
| 1<br>R1.epa.vanduzen.sed | R, Cr | Van Duzen River and Yager Creek | Sedimentation      | Various           | 12 16 1999           | 429                             | 1353 total allocation       |
| 1                        |       | Upper Basin                     | Sedimentation      | Road Construction |                      |                                 | 7                           |
| 1                        |       | Middle Basin                    | Sedimentation      | Road Construction |                      |                                 | 22                          |
| 1                        |       | Lower Basin                     | Sedimentation      | Road Construction |                      |                                 | 20                          |

| S Region | Type | Name | Pollutant Stressor | Potential | TMDL | Watershed | WLA tons mi <sup>2</sup> |
|----------|------|------|--------------------|-----------|------|-----------|--------------------------|
|----------|------|------|--------------------|-----------|------|-----------|--------------------------|

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|   |                  |    |                                 | <b>Sources</b>  | <b>Completion Date</b> | <b>Acres mi<sup>2</sup></b> | <b>yr</b>      |
|---|------------------|----|---------------------------------|-----------------|------------------------|-----------------------------|----------------|
| 6 | R6.blackwood.sed | Cr | Blackwood Creek (Placer County) | Bedded Sediment | Various                | 9 2007                      | 11 17272 total |

| <b>T Region</b> | <b>Type</b>    | <b>Name</b> | <b>Pollutant Stressor</b>   | <b>Potential Sources</b>            | <b>TMDL Completion Date</b>    | <b>Watershed Acres mi<sup>2</sup></b> | <b>WLA tons mi<sup>2</sup> yr</b> |
|-----------------|----------------|-------------|-----------------------------|-------------------------------------|--------------------------------|---------------------------------------|-----------------------------------|
| 6               | R6.SquawCk.sed | R           | Squaw Creek (Placer County) | Sedimentation /controllable sources | Various – basin plan amendment | 4 13 2006                             | 8.2 10,900                        |

## Adopted TMDLs for Construction Sediment Sources

| <b>Region</b> | <b>Type</b> | <b>Name</b>                           | <b>Pollutant Stressor</b> | <b>Potential Sources</b>      | <b>TMDL Completion Date</b> | <b>Watershed Area mi<sup>2</sup></b> | <b>Waste load Allocation tons mi<sup>2</sup> yr</b>                               |
|---------------|-------------|---------------------------------------|---------------------------|-------------------------------|-----------------------------|--------------------------------------|-----------------------------------------------------------------------------------|
| 8             | R           | Newport Bay San Diego Creek Watershed | Sedimentation             | Construction Land Development | 1999                        | 2.24 (1432 acres)                    | 125,000 tons per Year (no more than 13,000 tons per year from construction sites) |

## **APPENDIX 5: Glossary**

### **Active Areas of Construction**

All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

### **Active Treatment System (ATS)**

A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

### **Acute Toxicity Test**

A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

### **Air Deposition**

Airborne particulates from construction activities.

### **Approved Signatory**

A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;
5. For a public university: an authorized university official;
6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or
7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

### **Beneficial Uses**

As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

### **Best Available Technology Economically Achievable (BAT)**

As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

### **Best Conventional Pollutant Control Technology (BCT)**

As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

### **Best Professional Judgment (BPJ)**

The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

### **Best Management Practices (BMPs)**

BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

**Chain of Custody (COC)**

Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

**Coagulation**

The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

**Common Plan of Development**

Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

**Daily Average Discharge**

The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

**Debris**

Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

**Direct Discharge**

A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

**Discharger**

The Legally Responsible Person (see definition) or entity subject to this General Permit.

**Dose Rate (for ATS)**

In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

**Drainage Area**

The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

**Effluent**

Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

**Effluent Limitation**

Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

**Erosion**

The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

**Erosion Control BMPs**

Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

**Field Measurements**

Testing procedures performed in the field with portable field-testing kits or meters.

**Final Stabilization**

All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

**First Order Stream**

Stream with no tributaries.

**Flocculants**

Substances that interact with suspended particles and bind them together to form flocs.

**Good Housekeeping BMPs**

BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

**Grading Phase (part of the Grading and Land Development Phase)**

Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

**Hydromodification**

Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

**Identified Organisms**

Organisms within a sub-sample that is specifically identified and counted.

**Inactive Areas of Construction**

Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

**Index Period**

The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year, and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

**K Factor**

The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

**Legally Responsible Person**

The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.
2. In addition to the above, the following persons or entities may also serve as an LRP:
  - a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;
  - b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);
  - c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or
  - d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

### **Likely Precipitation Event**

Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

### **Maximum Allowable Threshold Concentration (MATC)**

The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity



testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

### **Natural Channel Evolution**

The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass through the suite of evolution stages, they will rest in a new state of equilibrium.

### **Non-Storm Water Discharges**

Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

### **Non-Visible Pollutants**

Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen through observation (ex: chlorine). Such pollutants being discharged are not authorized.

### **Numeric Action Level (NAL)**

Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

### **Original Sample Material**

The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

### **pH**

Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

### **Post-Construction BMPs**

Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

**Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)**

Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

**Project**

**Qualified SWPPP Developer**

Individual who is authorized to develop and revise SWPPPs.

**Qualified SWPPP Practitioner**

Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

**Qualifying Rain Event**

Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

**R Factor**

Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

**Rain Event Action Plan (REAP)**

Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

**Remaining Sub sampled Material**

The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

**Routine Maintenance**

Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

**Runoff Control BMPs**

Measures used to divert runoff from offsite and runoff within the site.

**Run-on**

Discharges that originate offsite and flow onto the property of a separate project site.

**Revised Universal Soil Loss Equation (RUSLE)**

Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

**Sampling and Analysis Plan**

Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

**Sediment**

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

**Sedimentation**

Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

**Sediment Control BMPs**

Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

**Settleable Solids (SS)**

Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

**Sheet Flow**

Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

**Site****Soil Amendment**

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

**Streets and Utilities Phase**

Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

**Structural Controls**

Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

**Suspended Sediment Concentration (SSC)**

The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

**Total Suspended Solids (TSS)**

The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

**Toxicity**

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

**Turbidity**

The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

**Vertical Construction Phase**

The Build out of structures from foundations to roofing, including rough landscaping.

**Waters of the United States**

Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.<sup>1</sup>

**Water Quality Objectives (WQO)**

Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

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<sup>1</sup> The application of the definition of “waters of the United States” may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

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## APPENDIX 6: Acronym List

|        |                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------|
| ASBS   | Areas of Special Biological Significance                                                            |
| ASTM   | American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils |
| ATS    | Active Treatment System                                                                             |
| BASMAA | Bay Area Storm water Management Agencies Association                                                |
| BAT    | Best Available Technology Economically Achievable                                                   |
| BCT    | Best Conventional Pollutant Control Technology                                                      |
| BMP    | Best Management Practices                                                                           |
| BOD    | Biochemical Oxygen Demand                                                                           |
| BPJ    | Best Professional Judgment                                                                          |
| CAFO   | Confined Animal Feeding Operation                                                                   |
| CCR    | California Code of Regulations                                                                      |
| CEQA   | California Environmental Quality Act                                                                |
| CFR    | Code of Federal Regulations                                                                         |
| CGP    | NPDES General Permit for Storm Water Discharges Associated with Construction Activities             |
| CIWQS  | California Integrated Water Quality System                                                          |
| CKD    | Cement Kiln Dust                                                                                    |
| COC    | Chain of Custody                                                                                    |
| CPESC  | Certified Professional in Erosion and Sediment Control                                              |
| CPSWQ  | Certified Professional in Storm Water Quality                                                       |
| CSMP   | Construction Site Monitoring Program                                                                |
| CTB    | Cement Treated Base                                                                                 |
| CTR    | California Toxics Rule                                                                              |
| CWA    | Clean Water Act                                                                                     |
| CWC    | California Water Code                                                                               |
| CWP    | Center for Watershed Protection                                                                     |
| DADMAC | Diallyldimethyl-ammonium chloride                                                                   |
| DDNR   | Delaware Department of Natural Resources                                                            |
| DFG    | Department of Fish and Game                                                                         |
| DHS    | Department of Health Services                                                                       |
| DWQ    | Division of Water Quality                                                                           |
| EC     | Electrical Conductivity                                                                             |
| ELAP   | Environmental Laboratory Accreditation Program                                                      |
| EPA    | Environmental Protection Agency                                                                     |
| ESA    | Environmentally Sensitive Area                                                                      |
| ESC    | Erosion and Sediment Control                                                                        |
| HSPF   | Hydrologic Simulation Program Fortran                                                               |
| JTU    | Jackson Turbidity Units                                                                             |
| LID    | Low Impact Development                                                                              |
| LOEC   | Lowest Observed Effect Concentration                                                                |
| LRP    | Legally Responsible Person                                                                          |
| LUP    | Linear Underground/Overhead Projects                                                                |

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| MATC           | Maximum Allowable Threshold Concentration                        |
| MDL            | Method Detection Limits                                          |
| MRR            | Monitoring and Reporting Requirements                            |
| MS4            | Municipal Separate Storm Sewer System                            |
| MUSLE          | Modified Universal Soil Loss Equation                            |
| NAL            | Numeric Action Level                                             |
| NEL            | Numeric Effluent Limitation                                      |
| NICET          | National Institute for Certification in Engineering Technologies |
| NOAA           | National Oceanic and Atmospheric Administration                  |
| NOEC           | No Observed Effect Concentration                                 |
| NOI            | Notice of Intent                                                 |
| NOT            | Notice of Termination                                            |
| NPDES          | National Pollutant Discharge Elimination System                  |
| NRCS           | Natural Resources Conservation Service                           |
| NTR            | National Toxics Rule                                             |
| NTU            | Nephelometric Turbidity Units                                    |
| O&M            | Operation and Maintenance                                        |
| PAC            | Polyaluminum chloride                                            |
| PAM            | Polyacrylamide                                                   |
| PASS           | Polyaluminum chloride Silica/sulfate                             |
| POC            | Pollutants of Concern                                            |
| PoP            | Probability of Precipitation                                     |
| POTW           | Publicly Owned Treatment Works                                   |
| PRDs           | Permit Registration Documents                                    |
| PWS            | Planning Watershed                                               |
| QAMP           | Quality Assurance Management Plan                                |
| QA/QC          | Quality Assurance/Quality Control                                |
| REAP           | Rain Event Action Plan                                           |
| Regional Board | Regional Water Quality Control Board                             |
| ROWD           | Report of Waste Discharge                                        |
| RUSLE          | Revised Universal Soil Loss Equation                             |
| RW             | Receiving Water                                                  |
| SMARTS         | Storm water Multi Application Reporting and Tracking             |
| System         |                                                                  |
| SS             | Settleable Solids                                                |
| SSC            | Suspended Sediment Concentration                                 |
| SUSMP          | Standard Urban Storm Water Mitigation Plan                       |
| SW             | Storm Water                                                      |
| SWARM          | Storm Water Annual Report Module                                 |
| SWAMP          | Surface Water Ambient Monitoring Program                         |
| SWMM           | Storm Water Management Model                                     |
| SWMP           | Storm Water Management Program                                   |
| SWPPP          | Storm Water Pollution Prevention Plan                            |
| TC             | Treatment Control                                                |
| TDS            | Total Dissolved Solids                                           |



|        |                                               |
|--------|-----------------------------------------------|
| TMDL   | Total Maximum Daily Load                      |
| TSS    | Total Suspended Solids                        |
| USACOE | U.S. Army Corps of Engineers                  |
| USC    | United States Code                            |
| USEPA  | United States Environmental Protection Agency |
| USGS   | United States Geological Survey               |
| WDID   | Waste Discharge Identification Number         |
| WDR    | Waste Discharge Requirements                  |
| WLA    | Waste Load Allocation                         |
| WET    | Whole Effluent Toxicity                       |
| WRCC   | Western Regional Climate Center               |
| WQBEL  | Water Quality Based Effluent Limitation       |
| WQO    | Water Quality Objective                       |
| WQS    | Water Quality Standard                        |

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## APPENDIX 7: State and Regional Water Resources Control Board Contacts

**NORTH COAST REGION (1)**

5550 Skylane Blvd, Ste. A  
Santa Rose, CA 95403  
(707) 576-2220 FAX: (707) 523-0135

**SAN FRANCISCO BAY REGION (2)**

1515 Clay Street, Ste. 1400  
Oakland, CA 94612  
(510) 622-2300 FAX: (510) 622-2640

**CENTRAL COAST REGION (3)**

895 Aerovista Place, Ste 101  
San Luis Obispo, CA 93401  
(805) 549-3147 FAX: (805) 543-0397

**LOS ANGELES REGION (4)**

320 W. 4<sup>th</sup> Street, Ste. 200  
Los Angeles, CA 90013  
(213) 576-6600 FAX: (213) 576-6640

**LAHONTAN REGION (6 SLT)**

2501 Lake Tahoe Blvd.  
South Lake Tahoe, CA 96150  
(530) 542-5400 FAX: (530) 544-2271

**VICTORVILLE OFFICE (6V)**

14440 Civic Drive, Ste. 200  
Victorville, CA 92392-2383  
(760) 241-6583 FAX: (760) 241-7308

**CENTRAL VALLEY REGION (5S)**

11020 Sun Center Dr., #200  
Rancho Cordova, CA 95670-6114  
(916) 464-3291 FAX: (916) 464-4645

**FRESNO BRANCH OFFICE (5F)**

1685 E St.  
Fresno, CA 93706  
(559) 445-5116 FAX: (559) 445-5910

**REDDING BRANCH OFFICE (5R)**

364 Knollcrest Drive, Ste. 205  
Redding, CA 96002  
(530) 224-4845 FAX: (530) 224-4857

**COLORADO RIVER BASIN REGION (7)**

73-720 Fred Waring Dr., Ste. 100  
Palm Desert, CA 92260  
(760) 346-7491 FAX: (760) 341-6820

**SANTA ANA REGION (8)**

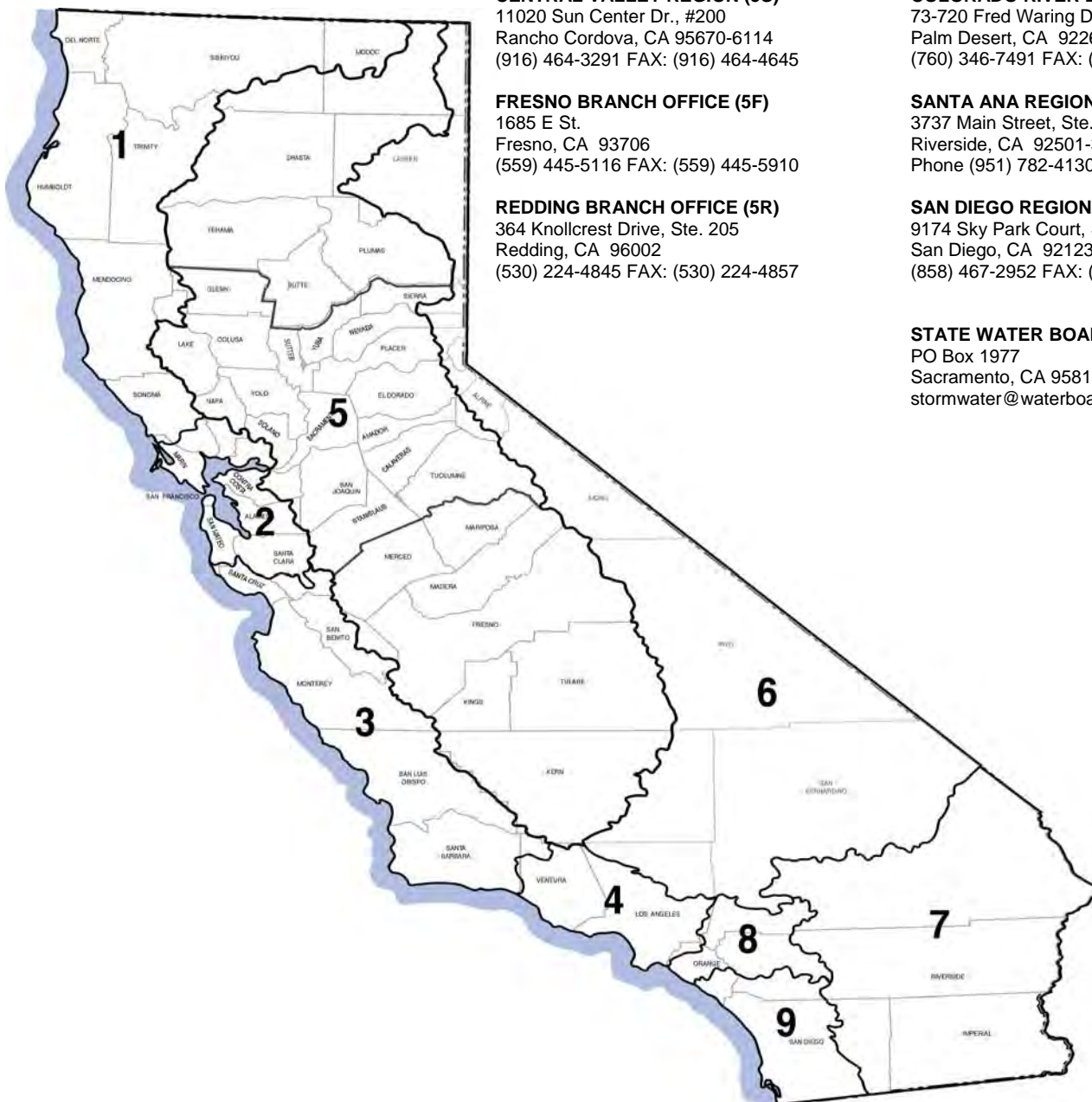
3737 Main Street, Ste. 500  
Riverside, CA 92501-3339  
Phone (951) 782-4130 FAX: (951) 781-6288

**SAN DIEGO REGION (9)**

9174 Sky Park Court, Ste. 100  
San Diego, CA 92123-4340  
(858) 467-2952 FAX: (858) 571-6972

**STATE WATER BOARD**

PO Box 1977  
Sacramento, CA 95812-1977  
stormwater@waterboards.ca.gov



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**APPENDIX B**  
**Remedial Grading, Erosion & Sediment Control, and Traffic Control Plans**

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# REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS

## ADDENDUM #2

### LILLARD RANCH PROPERTY - ASH REMEDIATION PROJECT 24998 COUNTY ROAD 102, DAVIS, YOLO COUNTY, CALIFORNIA

#### PROJECT OWNER / DEVELOPER:

WOODLAND BIOMASS POWER LTD.  
1786 E. KENTUCKY AVE  
WOODLAND, CA 95776

#### PROJECT PARCEL NUMBER:

042-120-010

#### PROJECT DESCRIPTION:

REMEDIAL EXCAVATION AND OFFSITE TRANSPORTATION OF CALIFORNIA HAZARDOUS ASH AND ONSITE MANAGEMENT OF NONHAZARDOUS ASH LOCATED ON A PROPERTY IDENTIFIED AS "THE LILLARD RANCH PROPERTY". ASH CONTAINING METAL (COPPER AND LEAD) CONCENTRATIONS ABOVE THE REGULATORY LEVELS WILL BE TRANSPORTED TO AN OFFSITE DISPOSAL FACILITY. ASH CONTAINING DIOXINS AND FURANS CONCENTRATIONS ABOVE THE AGRICULTURAL CRITERIA WILL BE BLENDED WITH ON-SITE NATIVE SOIL AND REUSED ONSITE. FURTHERMORE, ENTIRE FOOTPRINT OF THE AREA CONTAINING ASH WILL BE PLOWED/DISKED TO LOOSEN UP THE SOIL TO REMOVE METALLIC DEBRIS SUCH AS NAILS AND HINGES USING A MAGNET. EXCAVATION AREAS WILL BE BACKFILLED TO PRECONSTRUCTION GRADE ELEVATION. IT IS ANTICIPATED THAT APPROXIMATELY 37.5 ACRES OF LAND WILL BE SUBJECT TO GRADING AND RESTORATION ACTIVITIES.

THE REMEDIATION ACTIVITIES WILL BE OVERSEEN BY THE YOLO COUNTY DISTRICT ATTORNEY'S OFFICE AND CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF TOXIC SUBSTANCES.

#### PROJECT DURATION:

APRIL 10, 2017 THROUGH MAY 19, 2017

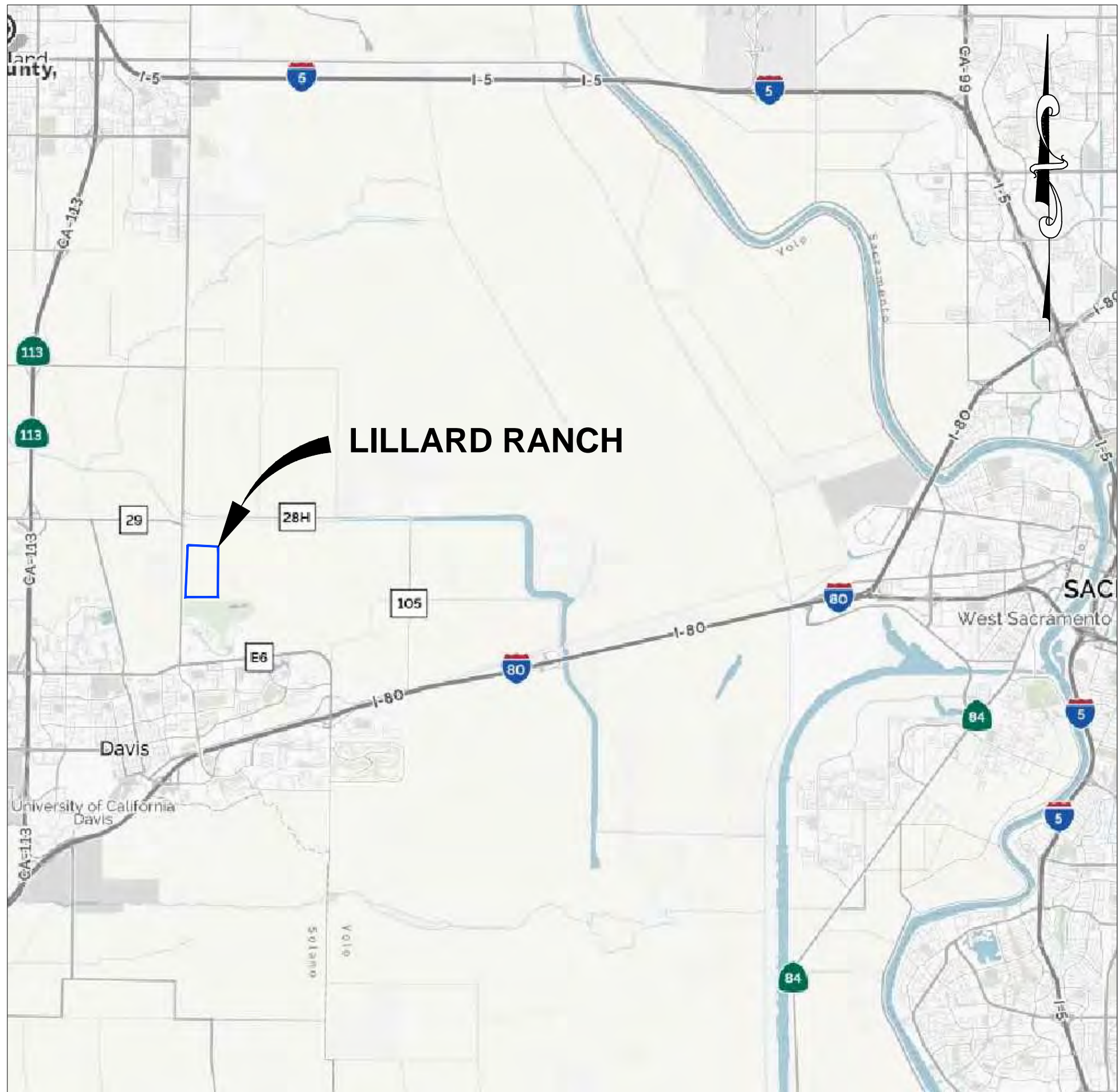
#### EARTHWORK QUANTITIES:

TOTAL CUT (CUBIC YARDS): 6,786.00 C.Y.  
TOTAL FILL (CUBIC YARDS): 6,786.00 C.Y.  
TOTAL IMPORT (CUBIC YARDS): 0\* C.Y.  
TOTAL EXPORT (CUBIC YARDS): 3,342.00 C.Y.

\*ONSITE STOCKPILED MATERIAL WILL BE USED TO BACKFILL EXCAVATED AREAS

#### ENGINEER OF RECORD:

TRC SOLUTIONS INC.  
9685 RESEARCH DRIVE  
IRVINE, CA 92618  
(949)341-7447  
PROJECT ENGINEER - ERCAN CANDAN, PE



LOCATION MAP

SCALE: 1" = 6,000'

#### BENCH MARK:

THE ELEVATIONS SHOWN HEREON ARE BASED UPON STATIC GPS OBSERVATION, HOLDING THE LEICA S.N.N.A. C.O.R.S. "PLSB"; ELEVATION = 929.56 FEET (NAVD 88)

#### BASES OF BEARINGS:

THE COORDINATES SHOWN HEREON ARE BASED UPON THE CALCULATED LINE BETWEEN THE TWO FOUND NGS POINTS, DESIGNATED "RFW1" AND "COY DUMP" PER PARCEL MAP 5063 RECORDED IN BOOK 2015 PAGES 33-34 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF YOLO COUNTY, THE COORDINATES OF THE NGS POINTS ARE AS FOLLOWS:

NGS POINT "RFW1"  
N: 1975368.34  
E: 6632721.09  
(GROUND VALUES)  
CALIFORNIA STATE PLANE, ZONE II  
(NAD83)

NGS POINT "COY DUMP"  
N: 1977246.47  
E: 6649649.01  
(GROUND VALUES)  
CALIFORNIA STATE PLANE, ZONE II  
(NAD83)



VICINITY MAP

SCALE: 1" = 1,000'

#### SHEET INDEX:

SHEET 1 TITLE SHEET  
SHEET 2 GRADING NOTES  
SHEET 3 SITE PLAN AND TEMPORARY FACILITIES  
SHEET 4 GRADING PLAN - DECISION UNIT GRADING  
SHEET 5 GRADING PLAN - DECISION UNIT GRADING  
SHEET 6 EROSION CONTROL PLAN  
SHEET 7 TRAFFIC CONTROL PLAN  
SHEET 8 GRADING PLAN - DECISION UNIT GRADING (DIOXIN FURAN REMOVAL)  
SHEET 9 GRADING PLAN - DECISION UNIT GRADING (DIOXIN FURAN REMOVAL)  
SHEET 10 GRADING PLAN - METALLIC DEBRIS REMOVAL  
SHEET 11 GRADING PLAN - METALLIC DEBRIS REMOVAL



ATTENTION:  
ALL UNDERGROUND UTILITIES AND SUBSTRUCTURES SHOWN HEREON WERE OBTAINED FROM THE BEST AVAILABLE SOURCES AND ARE PRESUMED TO BE ACCURATE AND COMPLETE. BUT SINCE THE INFORMATION WAS OBTAINED FROM OTHERS, THE OFFICE OF MNS ENGINEERS, INC. CANNOT GUARANTEE SAID INFORMATION AS BEING ACCURATE AND COMPLETE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO VERIFY, LOCATE, AND PROTECT ALL UTILITIES AND SUBSTRUCTURES SHOWN OR NOT SHOWN.  
CALL UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA TOLL FREE AT 1-800-422-4133 TWO WORKING DAYS BEFORE YOU DIG

UNAUTHORIZED CHANGES & USES  
CAUTION: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



9685 RESEARCH DRIVE  
IRVINE, CA 92618  
Phone: 949.341.7447  
www.trcsolutions.com

|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
| PRINT NAME:               | for Agency / Utility |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

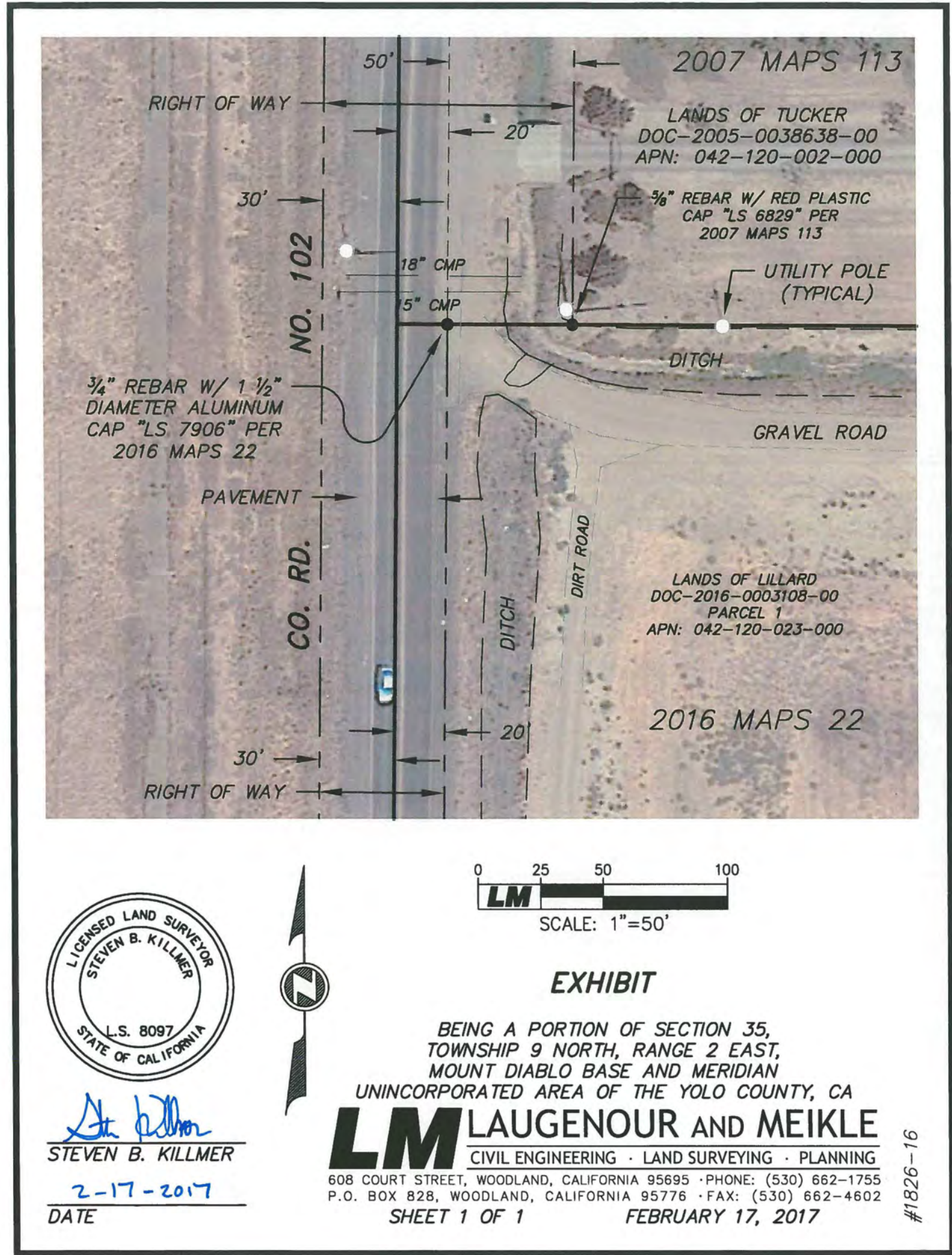
TITLE PAGE

SHEET 1  
OF  
11 SHEETS









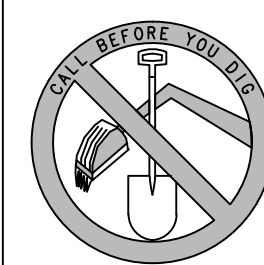
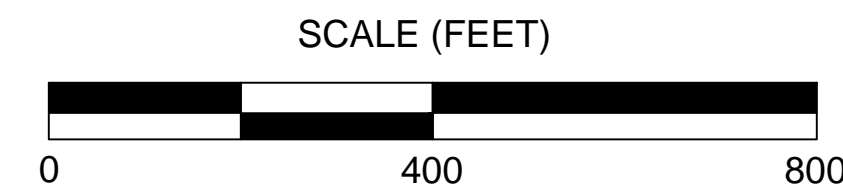
NOTES:

- 1 ASH BOUNDARY, REFER TO SHEET 4 FOR SPECIFIC AREAS OF EXCAVATION REFERRED TO IT AS "DECISION UNITS".
- 2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 SITE ENTRANCE / EXIT LOCATION FOR ALL CONSTRUCTION PERSONNEL, VISITORS, AND EQUIPMENT. REFER TO SHEET 6 FOR REQUIRED CONSTRUCTION SITE ENTRANCE IMPROVEMENTS AND 7 FOR TRAFFIC CONTROL PLAN.
- 5 DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 7 ACCESS ROADS TO PERSONNEL PARKING AND EQUIPMENT STORAGE AREA.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE AGRICULTURAL CRITERIA SPREADING/BLENDING AREA.

2 3 5 6 8 CLEARING AND GRUBBING OF VEGETATION MAY BE REQUIRED TO MAKE THESE LOCATIONS FUNCTIONAL FOR THEIR RESPECTIVE INTENDENT USE.

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- ONSITE STAFF ACCESS ROAD



ATTENTION:  
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UNAUTHORIZED CHANGES & USES  
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|     |           |    |                                                                         |
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| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN           |
|     |           |    | CONTAINING ASH SPREADING LOCATION                                       |
| REV | DATE      | BY | DESCRIPTION                                                             |



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IRVINE, CA 92618  
Phone: 949.341.7447  
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|                           |      |
|---------------------------|------|
| PROJECT ENGINEER          |      |
| ERCAN CANDAN, P.E. C72067 | DATE |
| PROJECT MANAGER           |      |
|                           | DATE |
| PRINT NAME:               | DATE |

|                      |      |
|----------------------|------|
| REVIEWED BY:         |      |
| for Agency / Utility | DATE |
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REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

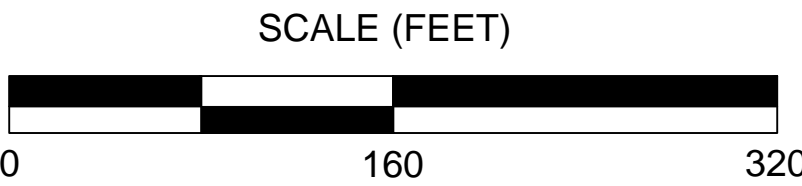
SITE PLAN AND TEMPORARY FACILITIES

SHEET 3  
OF  
11 SHEETS





MATCHLINE - SEE SHEET 5



NOTES:

1. PREPARE EXCAVATION, STOCKPILE AND HAUL ROADS BY TRIMMING, CLEARING, OR GRUBBING VEGETATION, IF PRESENT.
2. INSTALL A 10-MIL PLASTIC BARRIER WITHIN THE TEMPORARY STOCKPILE STAGING AREA FOOTPRINT. EXCAVATED ASH MATERIAL SHALL BE PLACED ON THE PLASTIC. UPON COMPLETION OF ALL EXCAVATION ACTIVITIES AND REMOVAL OF ALL ASH MATERIAL FROM THE STOCKPILE LOCATION, REMOVE AND DISPOSE THE PLASTIC AT AN APPROPRIATE OFFSITE DISPOSAL FACILITY.
3. ESTIMATED EXCAVATION DEPTH AND ASH VOLUME FOR EACH DECISION UNIT IS PROVIDED IN BELOW TABLE.
4. EXCAVATE ASH FROM DECISION UNITS 5C, 11C, 6D, 13G, 8H, 12J, 10L, 10M, 13M, 16P, 17T, 10V, 9W, 10Y, 20Z, 21Z, 24Z, 16BB, 18BB, 15DD, 14FF, 9GG, 28HH, 118, AND 27PP PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
5. UPON ACCUMULATION OF SUFFICIENT VOLUME OF ASH IN THE STOCKPILE STAGING AREA, LOAD END DUMP TRUCKS AND TRANSPORT TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
6. EXCAVATE ASH FROM DECISION UNITS 6D, 8H, 13G, 16P, 9W, 20Z, 18BB, 14FF, AND 28HH AND STOCKPILE SEPARATELY. COORDINATE WITH THE DISPOSAL FACILITY FOR THE TRANSPORT AND ACCEPTANCE OF THIS MATERIAL UNDER WASTE PROFILE NUMBER CA611751 AS MATERIAL FROM THESE DECISION UNITS WILL REQUIRE TREATMENT/STABILIZATION AT THE LANDFILL.
7. PERFORM ALL EXCAVATION WORK IN A MANNER TO MINIMIZE THE POTENTIAL FOR SPREADING ASH FROM SUBJECT DECISION UNITS TO OTHER AREAS OF THE SITE. EQUIPMENT EXCAVATING AND TRANSPORTING ASH TO THE STOCKPILE AREA SHALL BE LIMITED TO OPERATING ON THE AREA OF ASH, TO AVOID TRACKING ASH TO AREAS OF NON-ASH AT THE SITE.
8. ROUTE END DUMP TRUCKS TRANSPORTING ASH FROM THE NORTHERN ACCESS POINT AND ALONG THE TRAVEL PATH INDICATED ON SHEET 3. IMPROVEMENTS TO ACCESS ROUTE MAY BE REQUIRED.
9. LOAD END DUMP TRUCKS, TARP AND WEIGH TRUCKS ONSITE TO ENSURE TRUCKS MEET THE LEGAL LOAD LIMIT PRIOR TO LEAVING SITE FOR THE DISPOSAL FACILITY IN KETTLEMAN CITY.
10. UPON COMPLETION OF EXCAVATION OF ASH MATERIAL FROM DESIGNATED DECISION UNITS AND PRIOR TO BACKFILL, ENGINEER WILL COLLECT A CONFIRMATION SAMPLE FOR ANALYSIS. CONTRACTOR WILL PROVIDE UP TO 4 DAYS FOR SAMPLE ANALYSIS. BASED ON THE RESULTS OF THE LABORATORY ANALYSIS, AND AT DIRECTION OF THE ENGINEER, CONTRACTOR WILL FURTHER EXCAVATE OR WILL BACKFILL THE EXCAVATION.
11. PRIOR TO OBTAINING BACKFILL MATERIAL FROM THE ONSITE STOCKPILE, CONTRACTOR MUST ENSURE THAT THE DECISION UNIT I18 IS REMOVED, CONFIRMATION SAMPLE IS COLLECTED AND THE ENGINEER HAS PROVIDED CLEARANCE TO BEGIN REMOVING SOIL FROM THE HOSTETLER STOCKPILE FOR BACKFILL PURPOSES.
12. BACKFILL EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
13. PLACE BACKFILL MATERIAL IN SIX INCH LAYERS, AND COMPACT TO 90 PERCENT MINIMUM RELATIVE COMPACTION IN UNIFORM HORIZONTAL LAYERS.
14. UPON COMPLETION OF BACKFILLING ACTIVITIES, COMPACT ALL LOOSE SURFACES ON THE HOSTETLER STOCKPILE, SPREAD HYDROSEED TO PREVENT FUTURE EROSION AND SEDIMENT TRANSPORT FROM THE STOCKPILE AREA.
15. SPREAD HYDROSEED WHERE VEGETATION EXISTED PRIOR TO SITE CONSTRUCTION ACTIVITIES TO RETURN SITE TO PRE-GRADING CONDITIONS. REFER TO YOLO COUNTY STANDARDS SECTION 11-4.6.

- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE AGRICULTURAL CRITERIA SPREADING/BLENDING AREA.

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- 50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY

| DECISION UNIT | MAXIMUM ASH THICKNESS (INCHES) | ESTIMATED REMOVAL VOLUME (CUBIC YARDS) | CURRENT GROUND SURFACE ELEVATION (FEET) | PROPOSED GROUND SURFACE ELEVATION (FEET) |
|---------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 5C            | 12                             | 93                                     | 33.25                                   | 33.25                                    |
| 11C           | 12                             | 93                                     | 32.27                                   | 32.27                                    |
| 6D            | 12                             | 93                                     | 33.31                                   | 33.31                                    |
| 13G           | 18                             | 139                                    | 32.92                                   | 32.92                                    |
| 8H            | 24                             | 185                                    | 33.50                                   | 33.50                                    |
| 12J           | 18                             | 139                                    | 32.33                                   | 32.33                                    |
| 10L           | 18                             | 139                                    | 33.74                                   | 33.74                                    |
| 10M           | 24                             | 185                                    | 33.33                                   | 33.33                                    |
| 13M           | 12                             | 93                                     | 32.57                                   | 32.57                                    |
| 16P           | 18                             | 139                                    | 32.93                                   | 32.93                                    |
| 17T           | 12                             | 93                                     | 32.53                                   | 32.53                                    |
| 10V           | 12                             | 93                                     | 32.59                                   | 32.59                                    |
| 9W            | 12                             | 93                                     | 32.88                                   | 32.88                                    |
| 10Y           | 12                             | 93                                     | 32.63                                   | 32.63                                    |
| 20Z           | 12                             | 93                                     | 31.90                                   | 31.90                                    |
| 21Z           | 12                             | 93                                     | 32.08                                   | 32.08                                    |
| 24Z           | 12                             | 93                                     | 32.06                                   | 32.06                                    |
| 16BB          | 12                             | 93                                     | 32.54                                   | 32.54                                    |
| 18BB          | 18                             | 139                                    | 33.30                                   | 33.30                                    |
| 15DD          | 12                             | 93                                     | 32.73                                   | 32.73                                    |
| 14FF          | 12                             | 93                                     | 32.80                                   | 32.80                                    |
| 9GG           | 12                             | 93                                     | 33.09                                   | 33.09                                    |
| 28HH          | 18                             | 139                                    | 33.29                                   | 33.29                                    |
| I18           | 12                             | 93                                     | 33.28                                   | 33.28                                    |
| 27PP          | 12                             | 93                                     | 32.75                                   | 32.75                                    |
| TOTAL         |                                | 2,785                                  | CY (IN-PLACE)                           |                                          |
|               |                                | 3,342                                  | CY (WITH 20% EXPANSION)                 |                                          |
|               |                                | 5,013                                  | TONS (AT 1 CY=1.5 TONS)                 |                                          |



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| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                                                       |                                              |
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| PROJECT ENGINEER<br>ERCAN CANDAN, P.E. C72067<br>DATE | REVIEWED BY:<br>for Agency / Utility<br>DATE |
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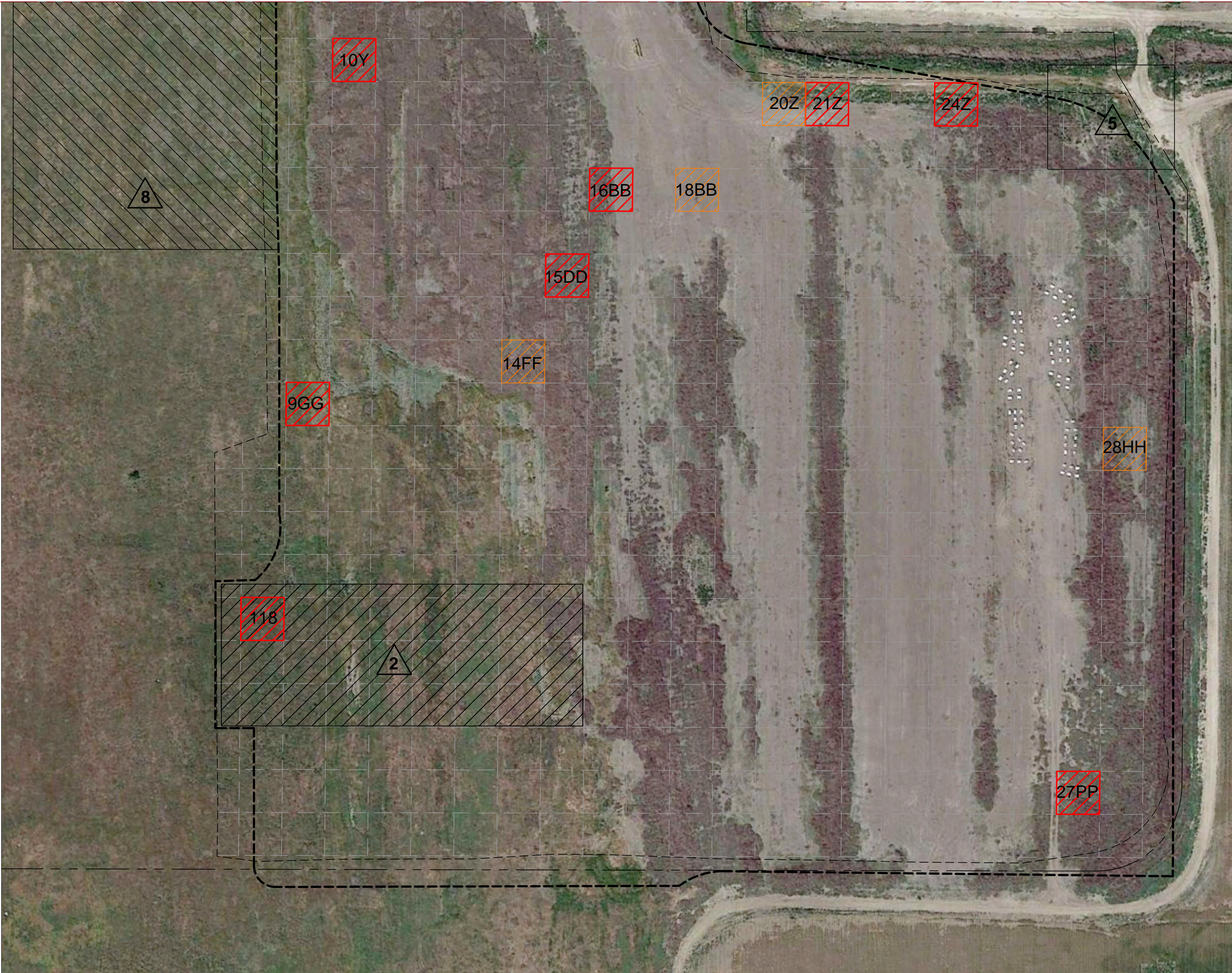
REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

GRADING PLAN-DECISION UNIT GRADING

SHEET 4  
OF  
11 SHEETS

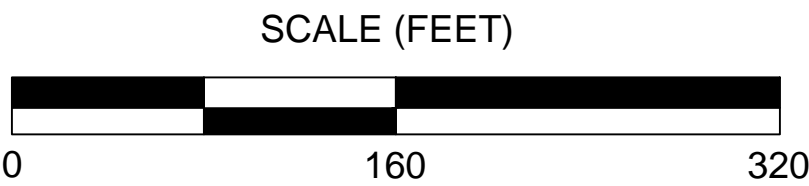


MATCHLINE - SEE SHEET 4



NOTES:

1. PREPARE EXCAVATION, STOCKPILE AND HAUL ROADS BY TRIMMING, CLEARING, OR GRUBBING VEGETATION, IF PRESENT.
2. INSTALL A 10-MIL PLASTIC BARRIER WITHIN THE TEMPORARY STOCKPILE STAGING AREA FOOTPRINT. EXCAVATED ASH MATERIAL SHALL BE PLACED ON THE PLASTIC. UPON COMPLETION OF ALL EXCAVATION ACTIVITIES AND REMOVAL OF ALL ASH MATERIAL FROM THE STOCKPILE LOCATION, REMOVE AND DISPOSE THE PLASTIC AT AN APPROPRIATE OFFSITE DISPOSAL FACILITY.
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NOTES CONTINUED:

6. EXCAVATE ASH FROM DECISION UNITS 6D, 8H, 13G, 16P, 9W, 20Z, 18BB, 14FF, AND 28HH AND STOCKPILE SEPARATELY. COORDINATE WITH THE DISPOSAL FACILITY FOR THE TRANSPORT AND ACCEPTANCE OF THIS MATERIAL UNDER WASTE PROFILE NUMBER CA611751 AS MATERIAL FROM THESE DECISION UNITS WILL REQUIRE TREATMENT/STABILIZATION AT THE LANDFILL.
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15. SPREAD HYDROSEED WHERE VEGETATION EXISTED PRIOR TO SITE CONSTRUCTION ACTIVITIES TO RETURN SITE TO PRE-GRADING CONDITIONS. REFER TO YOLO COUNTY STANDARDS SECTION 11-4.6.

- 2** ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 5** DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.
- 8** ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

| DECISION UNIT | MAXIMUM ASH THICKNESS (INCHES) | ESTIMATED REMOVAL VOLUME (CUBIC YARDS) | CURRENT GROUND SURFACE ELEVATION (FEET) | PROPOSED GROUND SURFACE ELEVATION (FEET) |
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| 11C           | 12                             | 93                                     | 32.27                                   | 32.27                                    |
| 6D            | 12                             | 93                                     | 33.31                                   | 33.31                                    |
| 13G           | 18                             | 139                                    | 32.92                                   | 32.92                                    |
| 8H            | 24                             | 185                                    | 33.50                                   | 33.50                                    |
| 12J           | 18                             | 139                                    | 32.33                                   | 32.33                                    |
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| 10M           | 24                             | 185                                    | 33.33                                   | 33.33                                    |
| 13M           | 12                             | 93                                     | 32.57                                   | 32.57                                    |
| 16P           | 18                             | 139                                    | 32.93                                   | 32.93                                    |
| 17T           | 12                             | 93                                     | 32.53                                   | 32.53                                    |
| 10V           | 12                             | 93                                     | 32.59                                   | 32.59                                    |
| 9W            | 12                             | 93                                     | 32.88                                   | 32.88                                    |
| 10Y           | 12                             | 93                                     | 32.63                                   | 32.63                                    |
| 20Z           | 12                             | 93                                     | 31.90                                   | 31.90                                    |
| 21Z           | 12                             | 93                                     | 32.08                                   | 32.08                                    |
| 24Z           | 12                             | 93                                     | 32.06                                   | 32.06                                    |
| 16BB          | 12                             | 93                                     | 32.54                                   | 32.54                                    |
| 18BB          | 18                             | 139                                    | 33.30                                   | 33.30                                    |
| 15DD          | 12                             | 93                                     | 32.73                                   | 32.73                                    |
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| I18           | 12                             | 93                                     | 33.28                                   | 33.28                                    |
| 27PP          | 12                             | 93                                     | 32.75                                   | 32.75                                    |

TOTAL 2,785  
CY (IN-PLACE)  
3,342  
CY (WITH 20% EXPANSION)  
5,013  
TONS (AT 1 CY=1.5 TONS)

LEGEND:

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| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                                                                                 |                                                                              |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| PROJECT ENGINEER<br>ERCAN CANDAN, P.E. C72067<br>PROJECT MANAGER<br>PRINT NAME: | REVIEWED BY:<br>for Agency / Utility<br>REVIEWED BY:<br>for Agency / Utility |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

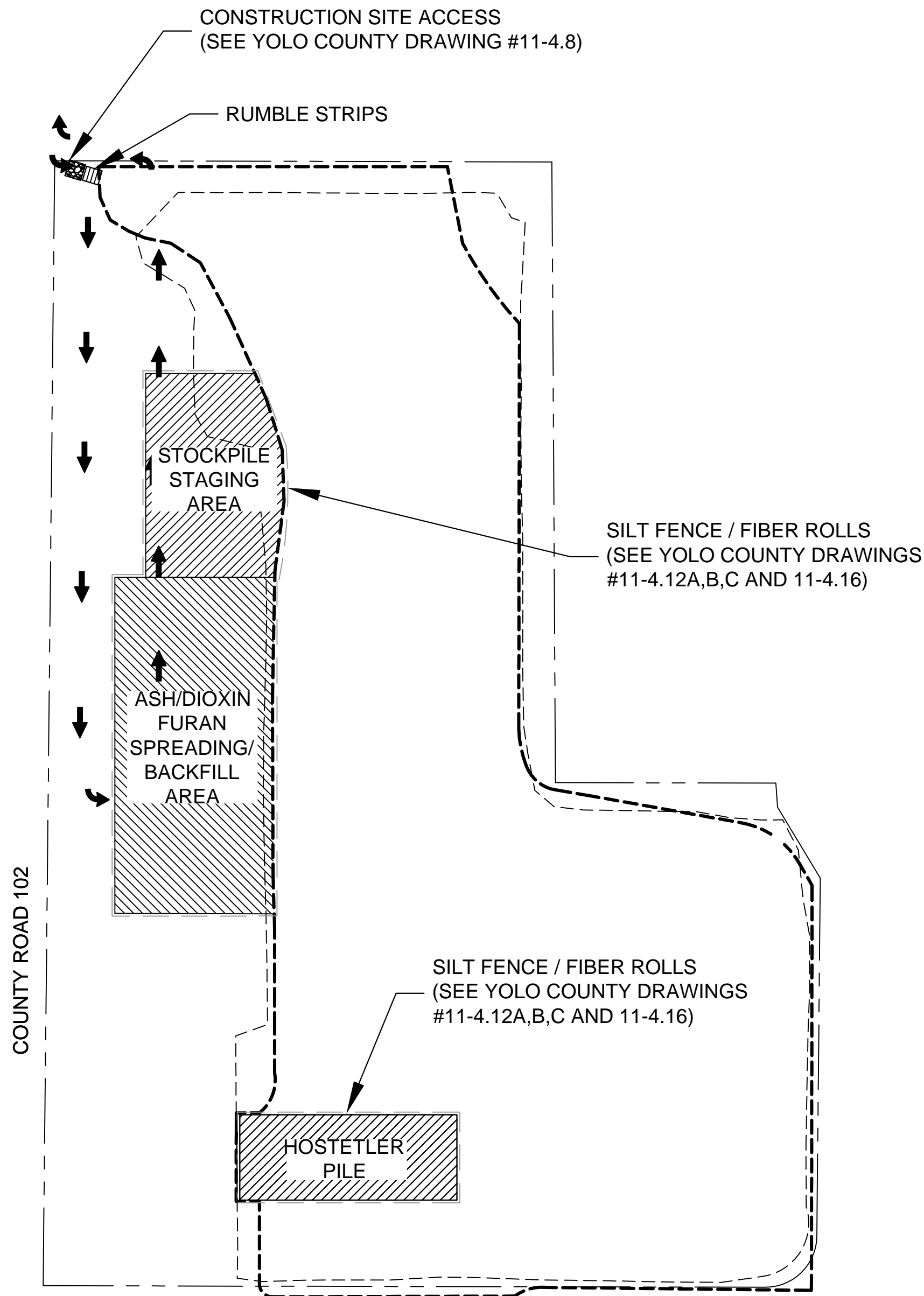
GRADING PLAN-DECISION UNIT GRADING

SHEET 5  
OF  
11 SHEETS



NOTES:

1. STORMWATER QUALITY, EROSION AND SEDIMENT CONTROL MEASURES WILL BE IN ACCORDANCE WITH SECTION 11 OF YOLO COUNTY IMPROVEMENT STANDARDS.
2. A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN PREPARED BY CONTRACTOR. A DESIGN FOR FINALIZATION BY CONTRACTOR IS INCLUDED IN THE ASH REMOVAL WORKPLAN. CONTRACTOR WILL FINALIZE AND SIGN THE SWPPP. WASTE DISCHARGE IDENTIFICATION NUMBER IS 5S57C378592.
3. DRAINAGE AND EROSION CONTROL MEASURES WILL BE IMPLEMENTED IN THE EVENT OF RAIN. ANY POTENTIALLY AFFECTED DRAINAGE DITCHES SHALL BE PROTECTED.
4. THESE MEASURES WOULD INCLUDE SILT FENCING, FIBER ROLLS, SAND BAGS, OR CONTAINMENT BERMS AS NECESSARY FOR SPECIFIC SITE CONDITIONS.
5. THE MINIMUM BEST MANAGEMENT PRACTICES (BMPs) ARE SHOWN ON THIS SHEET AND THE PROJECT SWPPP AND WILL BE INSTALLED AT ACTIVE EXCAVATION LOCATIONS.
6. UPON COMPLETION OF GRADING, HYDROSEED ALL DISTURBED AREAS IN GENERAL COMPLIANCE WITH YOLO COUNTY IMPROVEMENT STANDARDS SECTION 11-4.6.
7. YOLO COUNTY STANDARD BMP INSTALLATION SPECIFICATIONS FOR THE MINIMUM BMPs ARE PROVIDED BELOW.

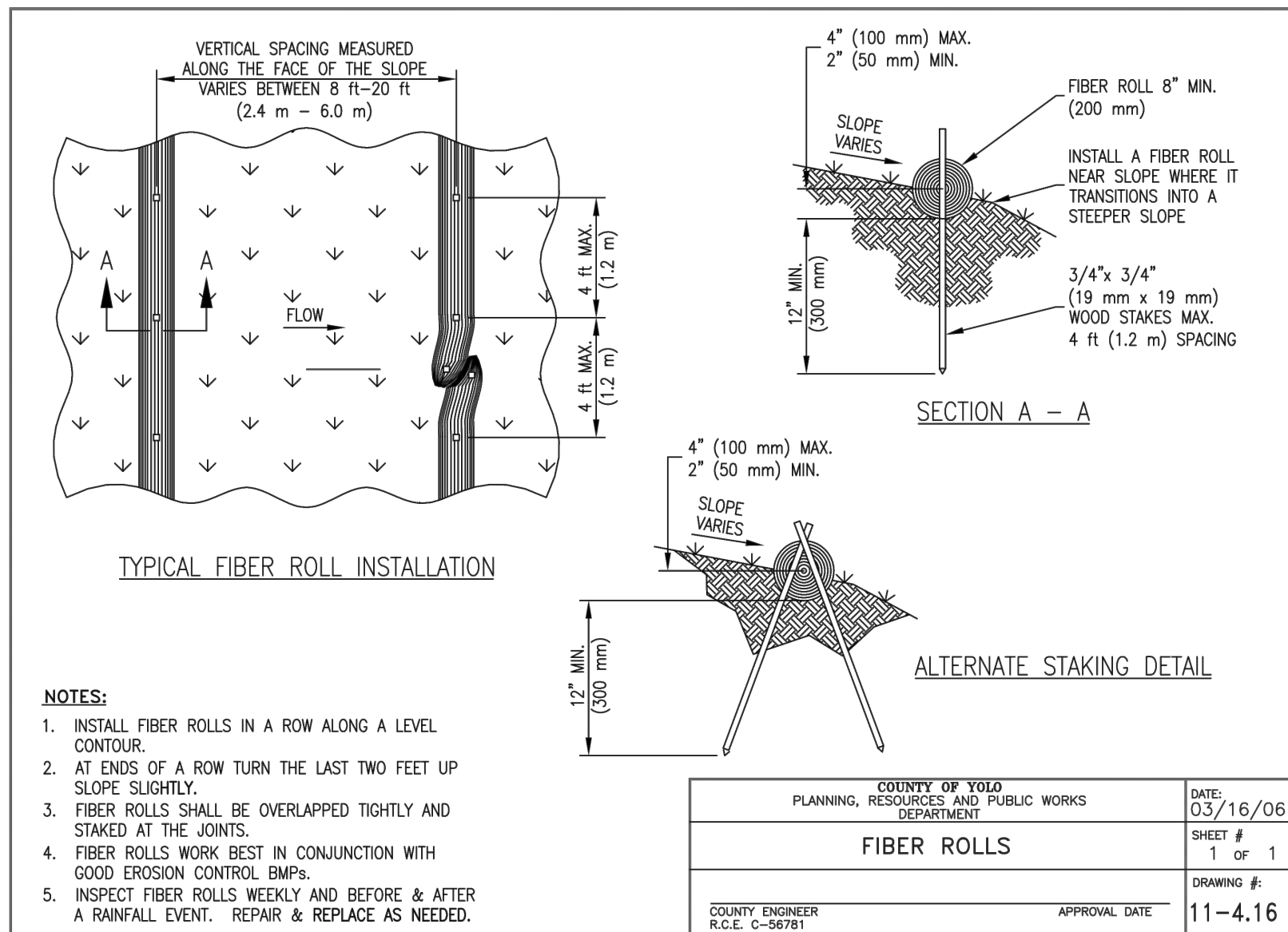
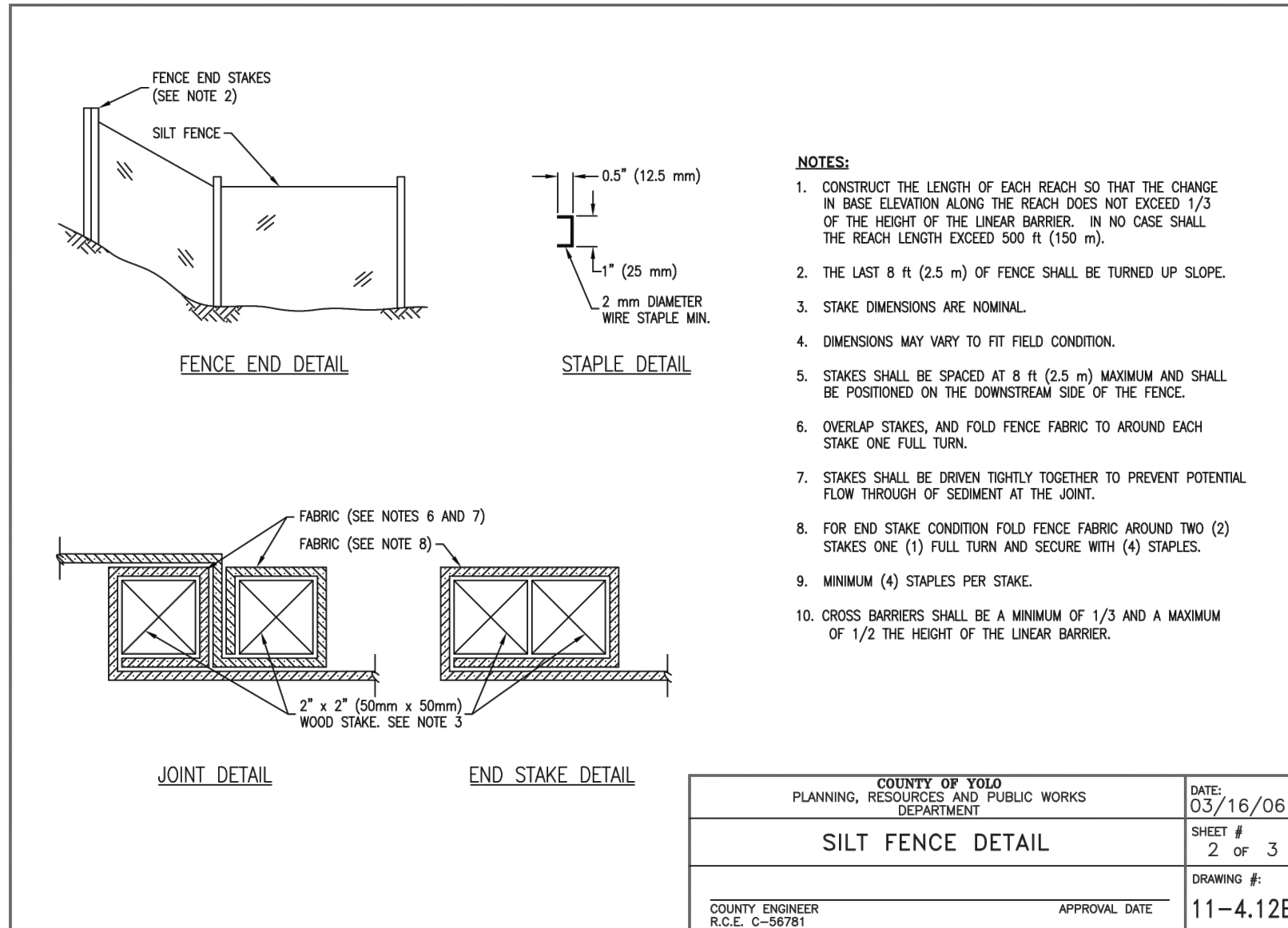
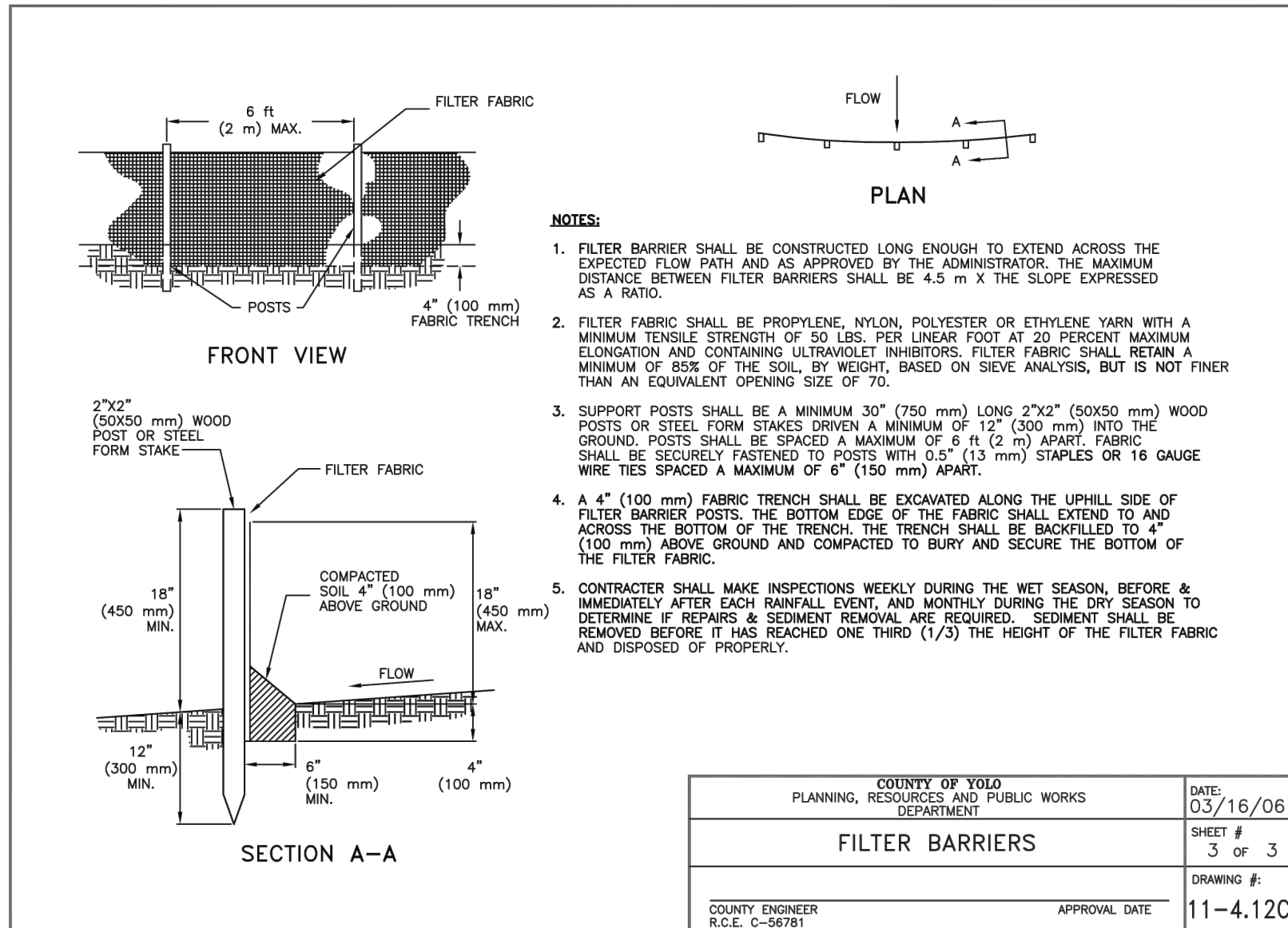
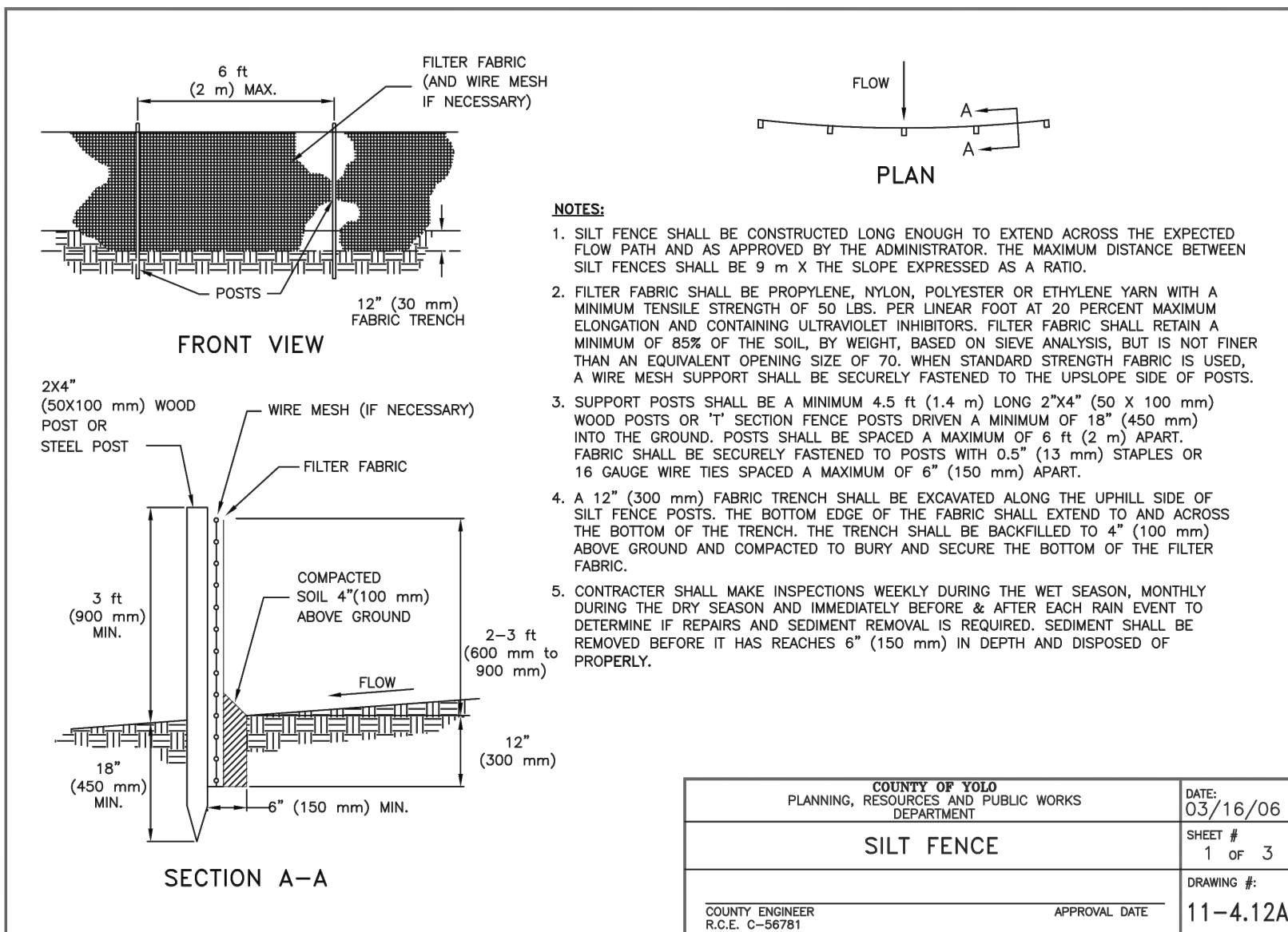
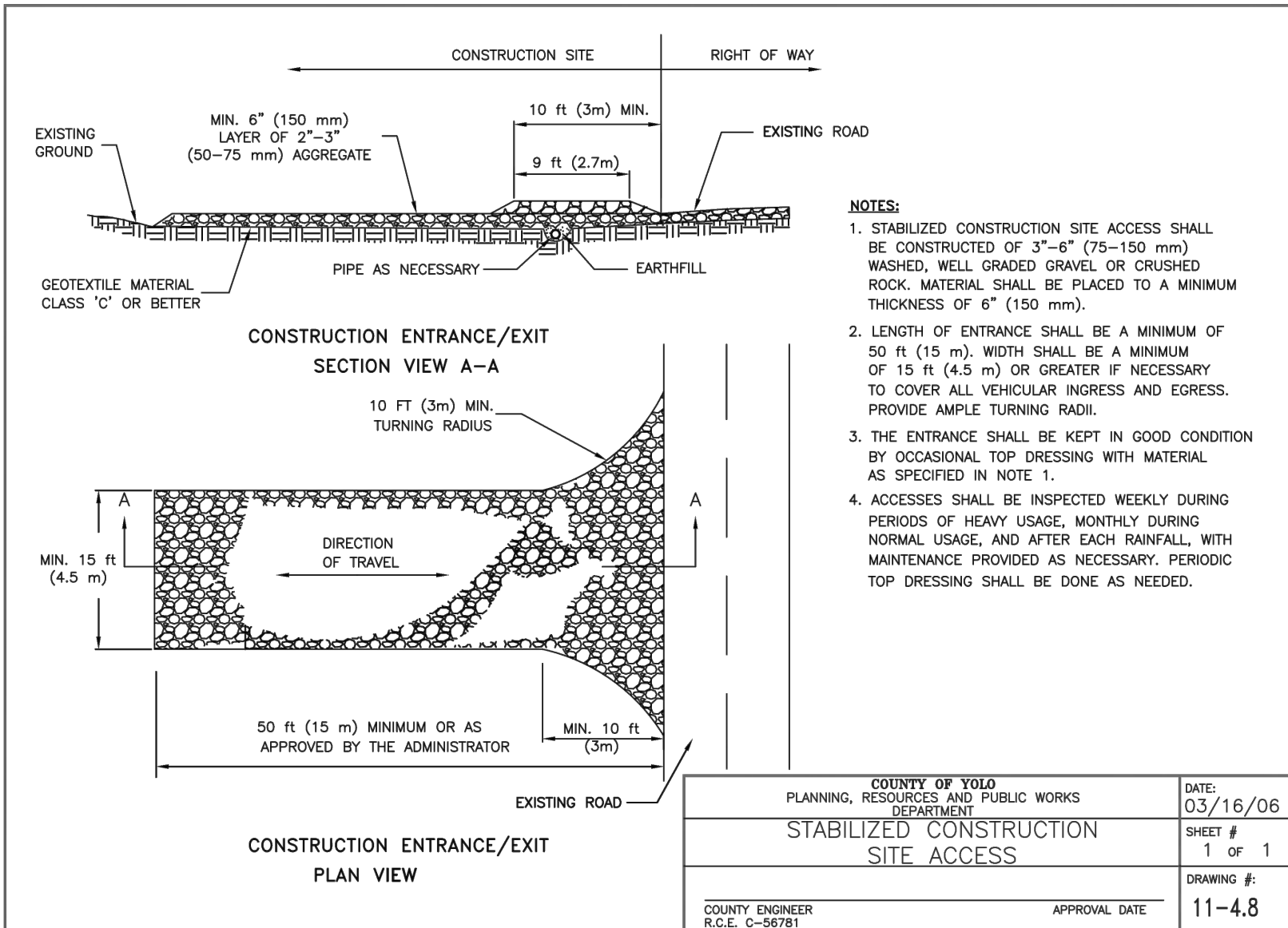
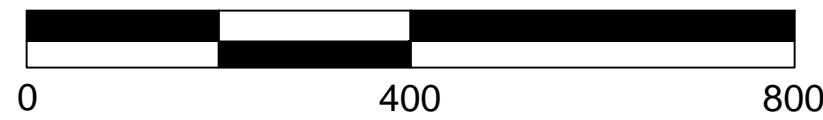


LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- ONSITE STAFF ACCESS ROAD



SCALE (FEET)



ATTENTION:

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CALL UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA TOLL FREE AT 1-800-422-4133 TWO WORKING DAYS BEFORE YOU DIG

UNAUTHORIZED CHANGES & USES

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|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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IRVINE, CA 92618  
Phone: 949.341.7447  
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|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
|                           | for Agency / Utility |
| PRINT NAME:               |                      |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

EROSION CONTROL PLAN

SHEET 6  
OF  
11 SHEETS





**TRAFFIC CONTROL NOTES:**

1. TRAFFIC CONTROL SHALL CONSIST OF ALL WORK AND MATERIALS NECESSARY TO MAINTAIN TRAFFIC AND ACCESS DURING ALL STAGES OF THE CONSTRUCTION AS SHOWN ON THIS SHEET AND IN GENERAL WORK PLAN.
2. THE ACCESS ROUTE TO THE WORK AREA IS SHOWN ON THE DRAWING. USE ONLY THE ACCESS ROUTE DESIGNATED ON THIS DRAWING.
3. TRUCKS SHALL ENTER THE SITE FROM THE NORTHERN ACCESS POINT AND TRAVEL ALONG THE EASTERN PROPERTY BOUNDARY TO GET TO THE STOCKPILE AREA AND EXIT FROM THE NORTHERN ACCESS POINT.
4. TRUCKS SHALL AVOID CITY STREETS AS MUCH AS POSSIBLE DURING TRANSPORTATION OF ASH TO THE OFFSITE LANDFILL.
5. TRUCKS ENTERING/EXITING SIGNS SHALL BE INSTALLED AT DESIGNATED LOCATIONS.
6. FLAGGER WILL BE REQUIRED AT THIS SITE ENTRANCE / EXIT. TRAFFIC ON NORTH BOUND MAY BE STOPPED INTERMITTENTLY BETWEEN 6:30 AM AND 11:30 AM TO DIRECT END DUMP TRUCKS IN / OUT OF THE SITE.
7. TRUCKS SHALL OBEY ALL POSTED SPEED LIMITS DURING TRAVEL TO AND FROM THE SITE.
8. TRUCKS SHALL NEVER HAUL MATERIAL IN EXCESS OF THE LEGAL LOAD LIMIT, AND ALL LOADS SHALL BE TARPED.
9. THE CONTRACTOR SHALL REMOVE AND REPLACE TRAFFIC CONTROL MARKINGS AND SYSTEMS THROUGHOUT THE CONSTRUCTION STAGES.
10. THE CONTRACTOR SHALL COOPERATE WITH THE SITE QUALITY CONTROL OFFICER RELATIVE TO HANDLING TRAFFIC AROUND THE CONSTRUCTION AREA AND SHALL MAKE ARRANGEMENTS RELATIVE TO KEEPING THE WORKING AREA CLEAR OF PARKED VEHICLES.
11. IN ORDER TO MINIMIZE DUST MIGRATION FROM SITE, 10-MPH SHALL BE IMPLEMENTED WHILE DRIVING IN DIRT ROADS WITHIN THE SITE.
12. DAMAGE DONE BY THE CONTRACTOR DURING THE COURSE OF WORK TO ADJACENT PROPERTIES SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ADJACENT PROPERTY OWNERS.
13. PERSONAL VEHICLES OF THE CONTRACTOR'S EMPLOYEES, AND THE CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL NOT BE PARKED ON THE TRAVELED WAY OR SHOULDERS AT ANY TIME. WHEN ENTERING OR LEAVING ROADWAYS CARRYING PUBLIC TRAFFIC, THE CONTRACTOR'S EQUIPMENT, WHETHER EMPTY OR LOADED, SHALL IN ALL CASES YIELD TO PUBLIC TRAFFIC AND SHALL TRAVEL IN THE DIRECTION OF THE TRAFFIC. FLAGGERS AND TRAFFIC SIGNS MAY BE REQUIRED TO CONTROL THIS ACTIVITY.

- 2** ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 3** PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 5** DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.
- 7** ACCESS ROADS TO PERSONNEL PARKING AND EQUIPMENT STORAGE AREA.
- 8** ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

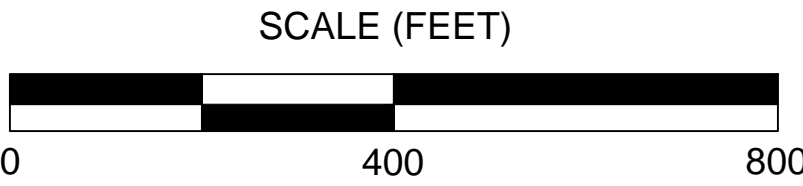
**TRUCK AND FLAGGER SIGNS**



W20-7  
FLAGGER AHEAD

**LEGEND:**

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- TRUCK TRAFFIC SIGN
- FLAGGER



**ATTENTION:**  
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|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                           |      |
|---------------------------|------|
| PROJECT ENGINEER          | DATE |
| ERCAN CANDAN, P.E. C72067 |      |
| PROJECT MANAGER           | DATE |
|                           |      |
| PRINT NAME:               | DATE |

|                      |      |
|----------------------|------|
| REVIEWED BY:         | DATE |
| for Agency / Utility |      |
| REVIEWED BY:         | DATE |
| for Agency / Utility |      |

REMEDIATION GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

**TRAFFIC CONTROL PLAN**





SHEET 7  
OF  
11 SHEETS



NOTES:

ALL NOTES ON SHEETS 2, 4, AND 5 APPLY TO DIOXIN FURAN CONTAINING DECISION UNITS DESCRIBED ON THIS SHEET. ADDITIONAL NOTES FOR THE ALTERNATIVES AS DESCRIBED IN THE BID DOCUMENTS PROVIDED BELOW





- EXCAVATE ASH FROM DIOXIN FURAN DECISION UNITS PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
- REMOVE METAL DEBRIS FROM DIOXIN FURAN CONTAINING ASH AS DESCRIBED IN SHEETS 10 AND 11 FOR USE AS BACKFILL ONSITE.
- SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED, ON-SITE IN 3" LAYERS AND DISKING INTO NATIVE SOILS BENEATH DECISION UNITS WHERE ASH HAS BEEN REMOVED. COMPLETE BACKFILLING OF THE EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
- SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED IN ON-SITE AREAS WITHOUT ASH IN 3" LAYERS AND DISK INTO NATIVE SOILS WITHIN THE AREA SHOWN ON THESE PLANS.

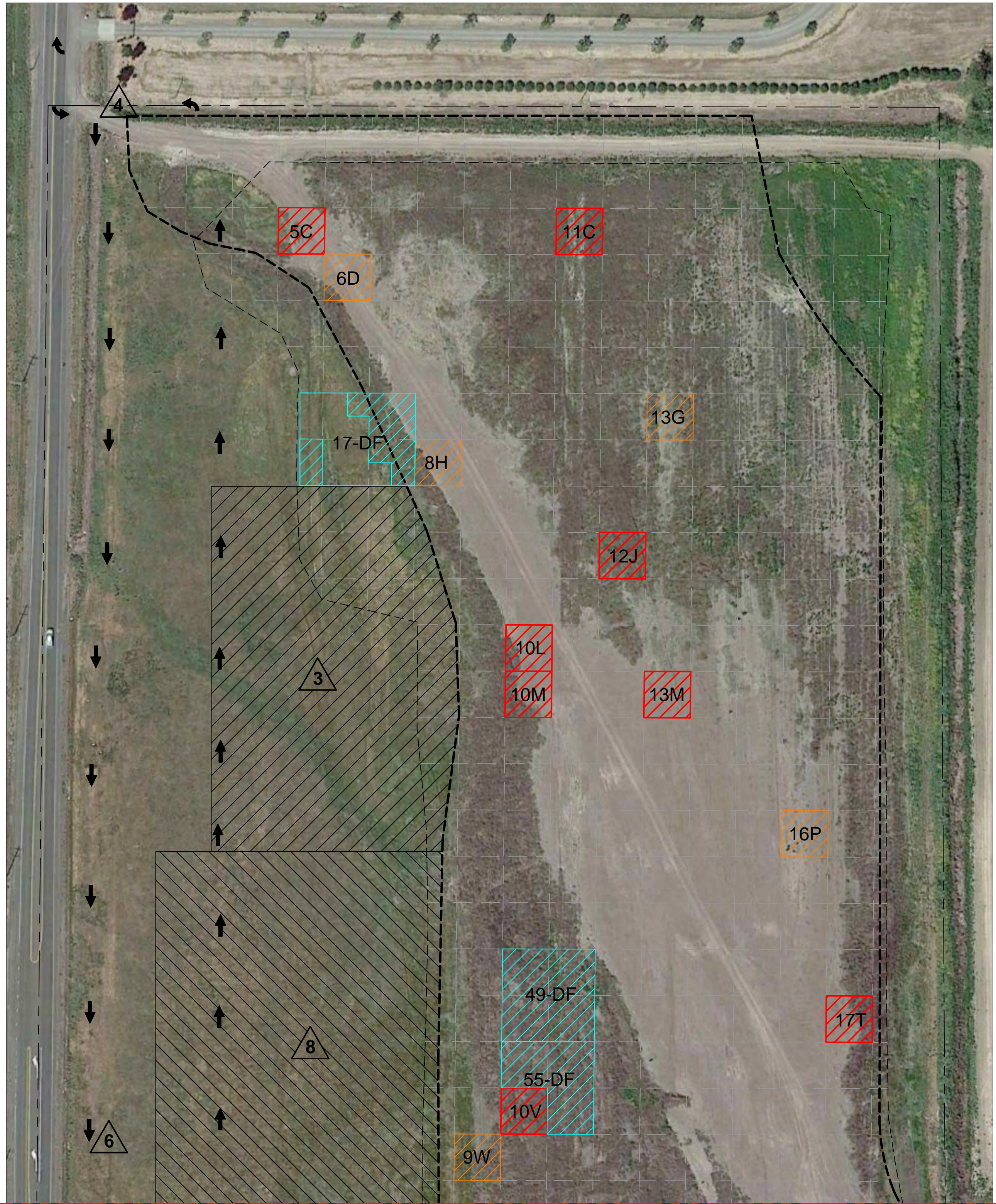
-  PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
-  CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
-  DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
-  ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

| Dioxin/Furan Units | Decision Unit Grids | Maximum Ash Thickness (Inches) | Estimated Removal Volume (Cubic Yards) | Current Ground Surface Elevation (feet) | Proposed Ground Surface Elevation (feet) |
|--------------------|---------------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 17-DF              | 6G                  | 6                              | 12                                     | 32.85                                   | 32.85                                    |
|                    | 7G                  | 14                             | 108                                    | 32.71                                   | 32.71                                    |
|                    | 5H                  | 6                              | 20                                     | 33.41                                   | 33.41                                    |
|                    | 7H                  | 6                              | 24                                     | 32.69                                   | 32.69                                    |
|                    | 10S                 | 8                              | 60                                     | 32.57                                   | 32.57                                    |
| 49-DF              | 11S                 | 8                              | 60                                     | 32.80                                   | 32.8                                     |
|                    | 10T                 | 8                              | 60                                     | 32.66                                   | 32.66                                    |
|                    | 11T                 | 10                             | 76                                     | 32.58                                   | 32.58                                    |
|                    | 10U                 | 8                              | 45                                     | 32.70                                   | 32.7                                     |
| 55-DF              | 11U                 | 10                             | 57                                     | 32.89                                   | 32.89                                    |
|                    | 11V                 | 9                              | 51                                     | 32.74                                   | 32.74                                    |
|                    | 10AA                | 6                              | 36                                     | 32.59                                   | 32.59                                    |
| 77-DF              | 9BB                 | 6                              | 36                                     | 32.81                                   | 32.81                                    |
|                    | 10BB                | 6                              | 36                                     | 32.77                                   | 32.77                                    |
| 80-DF              | 23CC                | 12                             | 92                                     | 32.84                                   | 32.84                                    |
|                    | 24CC                | 12                             | 92                                     | 32.07                                   | 32.07                                    |
|                    | 23DD                | 12                             | 92                                     | 32.92                                   | 32.92                                    |
|                    | 24DD                | 12                             | 92                                     | 32.34                                   | 32.34                                    |
| 81-DF              | 21CC                | 7                              | 56                                     | 32.01                                   | 32.01                                    |
|                    | 22CC                | 10                             | 76                                     | 32.34                                   | 32.34                                    |
|                    | 21DD                | 11                             | 84                                     | 32.38                                   | 32.38                                    |
|                    | 22DD                | 12                             | 92                                     | 32.60                                   | 32.6                                     |
| 88-DF              | 29DD                | 10                             | 38                                     | 32.78                                   | 32.78                                    |
|                    | 29EE                | 12                             | 46                                     | 32.35                                   | 32.35                                    |
|                    | 29FF                | 14                             | 54                                     | 32.17                                   | 32.17                                    |
|                    | 29GG                | 15                             | 58                                     | 32.37                                   | 32.37                                    |
| 91-DF              | 23EE                | 12                             | 92                                     | 32.85                                   | 32.85                                    |
|                    | 24EE                | 12                             | 92                                     | 32.42                                   | 32.42                                    |
|                    | 23FF                | 10                             | 40                                     | 32.94                                   | 32.94                                    |
|                    | 24FF                | 12                             | 92                                     | 32.24                                   | 32.24                                    |
| 94-DF              | 17EE                | 11                             | 84                                     | 32.86                                   | 32.86                                    |
|                    | 18EE                | 9                              | 68                                     | 32.82                                   | 32.82                                    |
|                    | 17FF                | 10                             | 76                                     | 33.02                                   | 33.02                                    |
|                    | 18FF                | 10                             | 76                                     | 32.63                                   | 32.63                                    |
| 100-DF             | 23GG                | 12                             | 92                                     | 33.35                                   | 33.35                                    |
|                    | 24GG                | 14                             | 27                                     | 32.49                                   | 32.49                                    |
|                    | 23HH                | 12                             | 92                                     | 33.46                                   | 33.46                                    |
|                    | 24HH                | 12                             | 92                                     | 32.62                                   | 32.62                                    |
| 104-DF             | 15GG                | 9                              | 68                                     | 32.75                                   | 32.75                                    |
|                    | 16GG                | 10                             | 76                                     | 32.85                                   | 32.85                                    |
|                    | 15HH                | 6                              | 36                                     | 32.68                                   | 32.68                                    |
|                    | 16HH                | 10                             | 76                                     | 32.76                                   | 32.76                                    |
| 111-DF             | 21II                | 13                             | 100                                    | 32.67                                   | 32.67                                    |
|                    | 22II                | 12                             | 92                                     | 33.21                                   | 33.21                                    |
|                    | 21JJ                | 13                             | 100                                    | 32.68                                   | 32.68                                    |
|                    | 22JJ                | 12                             | 92                                     | 33.29                                   | 33.29                                    |
| 127-DF             | 21MM                | 10                             | 76                                     | 33.07                                   | 33.07                                    |
|                    | 22MM                | 11                             | 84                                     | 33.15                                   | 33.15                                    |
|                    | 21NN                | 10                             | 76                                     | 32.83                                   | 32.83                                    |
|                    | 22NN                | 12                             | 92                                     | 33.15                                   | 33.15                                    |

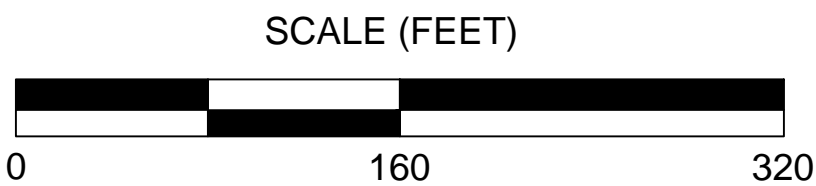
TOTAL 3444 5166 CY (IN-PLACE) TONS (AT 1CY = 1.5 TONS)

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
-  50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH
-  50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
-  50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY
-  100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA



MATCHLINE - SEE SHEET 9



|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
| PRINT NAME:               | for Agency / Utility |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY  
GRADING PLAN-DECISION UNIT GRADING DIOXIN FURAN REMOVAL

SHEET 8  
OF  
11 SHEETS



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NOTES:

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1. EXCAVATE ASH FROM DIOXIN FURAN DECISION UNITS PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
2. REMOVE METAL DEBRIS FROM DIOXIN FURAN CONTAINING ASH AS DESCRIBED IN SHEETS 10 AND 11 FOR USE AS BACKFILL ONSITE.
3. SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED, ON-SITE IN 3" LAYERS AND DISKING INTO NATIVE SOILS BENEATH DECISION UNITS WHERE ASH HAS BEEN REMOVED. COMPLETE BACKFILLING OF THE EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
4. SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED IN ON-SITE AREAS WITHOUT ASH IN 3" LAYERS AND DISK INTO NATIVE SOILS WITHIN THE AREA SHOWN ON THESE PLANS.

2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.

5 DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.

| Dioxin/Furan Units | Decision Unit Grids | Maximum Ash Thickness (Inches) | Estimated Removal Volume (Cubic Yards) | Current Ground Surface Elevation (feet) | Proposed Ground Surface Elevation (feet) |
|--------------------|---------------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 17-DF              | 6G                  | 6                              | 12                                     | 32.85                                   | 32.85                                    |
|                    | 7G                  | 14                             | 108                                    | 32.71                                   | 32.71                                    |
|                    | 5H                  | 6                              | 20                                     | 33.41                                   | 33.41                                    |
|                    | 7H                  | 6                              | 24                                     | 32.69                                   | 32.69                                    |
| 49-DF              | 10S                 | 8                              | 60                                     | 32.57                                   | 32.57                                    |
|                    | 11S                 | 8                              | 60                                     | 32.80                                   | 32.8                                     |
|                    | 10T                 | 8                              | 60                                     | 32.66                                   | 32.66                                    |
|                    | 11T                 | 10                             | 76                                     | 32.58                                   | 32.58                                    |
| 55-DF              | 10U                 | 8                              | 45                                     | 32.70                                   | 32.7                                     |
|                    | 11U                 | 10                             | 57                                     | 32.89                                   | 32.89                                    |
|                    | 11V                 | 9                              | 51                                     | 32.74                                   | 32.74                                    |
| 77-DF              | 10AA                | 6                              | 36                                     | 32.59                                   | 32.59                                    |
|                    | 9BB                 | 6                              | 36                                     | 32.81                                   | 32.81                                    |
|                    | 10BB                | 6                              | 36                                     | 32.77                                   | 32.77                                    |
| 80-DF              | 23CC                | 12                             | 92                                     | 32.84                                   | 32.84                                    |
|                    | 24CC                | 12                             | 92                                     | 32.07                                   | 32.07                                    |
|                    | 23DD                | 12                             | 92                                     | 32.92                                   | 32.92                                    |
|                    | 24DD                | 12                             | 92                                     | 32.34                                   | 32.34                                    |
| 81-DF              | 21CC                | 7                              | 56                                     | 32.01                                   | 32.01                                    |
|                    | 22CC                | 10                             | 76                                     | 32.34                                   | 32.34                                    |
|                    | 21DD                | 11                             | 84                                     | 32.38                                   | 32.38                                    |
|                    | 22DD                | 12                             | 92                                     | 32.60                                   | 32.6                                     |
| 88-DF              | 29DD                | 10                             | 38                                     | 32.78                                   | 32.78                                    |
|                    | 29EE                | 12                             | 46                                     | 32.35                                   | 32.35                                    |
|                    | 29FF                | 14                             | 54                                     | 32.17                                   | 32.17                                    |
|                    | 29GG                | 15                             | 58                                     | 32.37                                   | 32.37                                    |
| 91-DF              | 23EE                | 12                             | 92                                     | 32.85                                   | 32.85                                    |
|                    | 24EE                | 12                             | 92                                     | 32.42                                   | 32.42                                    |
|                    | 23FF                | 10                             | 40                                     | 32.94                                   | 32.94                                    |
|                    | 24FF                | 12                             | 92                                     | 32.24                                   | 32.24                                    |
| 94-DF              | 17EE                | 11                             | 84                                     | 32.86                                   | 32.86                                    |
|                    | 18EE                | 9                              | 68                                     | 32.82                                   | 32.82                                    |
|                    | 17FF                | 10                             | 76                                     | 33.02                                   | 33.02                                    |
|                    | 18FF                | 10                             | 76                                     | 32.63                                   | 32.63                                    |
| 100-DF             | 23GG                | 12                             | 92                                     | 33.35                                   | 33.35                                    |
|                    | 24GG                | 14                             | 27                                     | 32.49                                   | 32.49                                    |
|                    | 23HH                | 12                             | 92                                     | 33.46                                   | 33.46                                    |
|                    | 24HH                | 12                             | 92                                     | 32.62                                   | 32.62                                    |
| 104-DF             | 15GG                | 9                              | 68                                     | 32.75                                   | 32.75                                    |
|                    | 16GG                | 10                             | 76                                     | 32.85                                   | 32.85                                    |
|                    | 15HH                | 6                              | 36                                     | 32.68                                   | 32.68                                    |
|                    | 16HH                | 10                             | 76                                     | 32.76                                   | 32.76                                    |
| 111-DF             | 21II                | 13                             | 100                                    | 32.67                                   | 32.67                                    |
|                    | 22II                | 12                             | 92                                     | 33.21                                   | 33.21                                    |
|                    | 21JJ                | 13                             | 100                                    | 32.68                                   | 32.68                                    |
|                    | 22JJ                | 12                             | 92                                     | 33.29                                   | 33.29                                    |
| 127-DF             | 21MM                | 10                             | 76                                     | 33.07                                   | 33.07                                    |
|                    | 22MM                | 11                             | 84                                     | 33.15                                   | 33.15                                    |
|                    | 21NN                | 10                             | 76                                     | 32.83                                   | 32.83                                    |
|                    | 22NN                | 12                             | 92                                     | 33.15                                   | 33.15                                    |

LEGEND:

--- APPROXIMATE SITE BOUNDARY

--- APPROXIMATE EXTENT OF ASH

--- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS

50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH

50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY

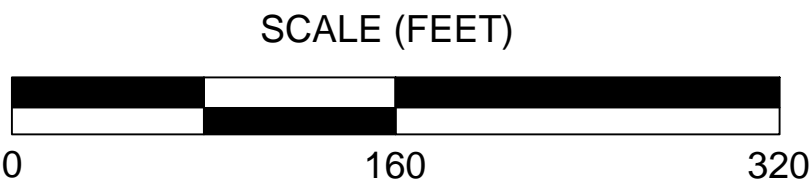
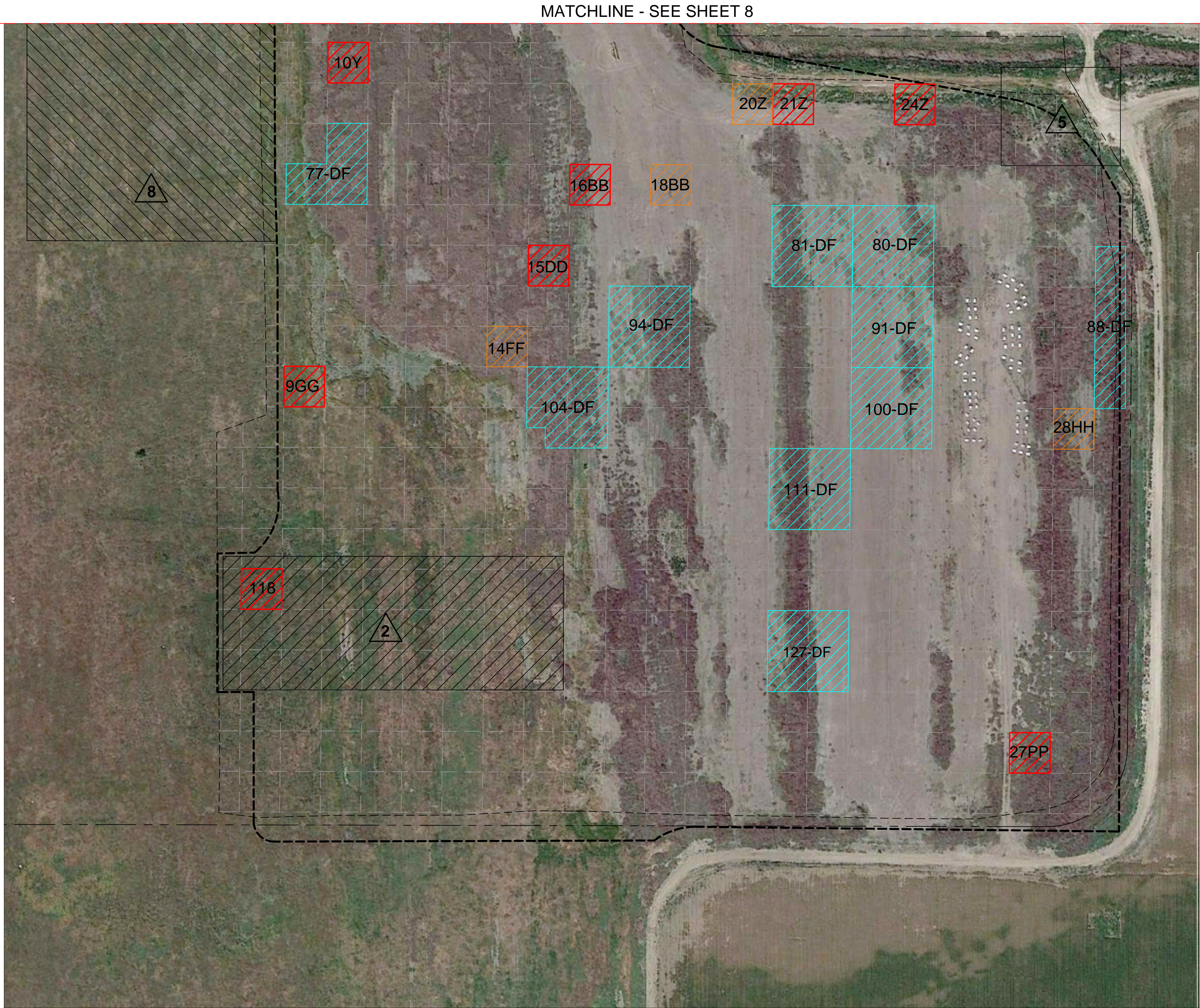
100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA

TOTAL 3444 5166 CY (IN-PLACE) TONS (AT 1CY = 1.5 TONS)



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|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
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| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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IRVINE, CA 92618  
Phone: 949.341.7447  
www.trcsolutions.com

|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
| PRINT NAME:               | for Agency / Utility |

|      |      |
|------|------|
| DATE | DATE |
| DATE | DATE |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

GRADING PLAN-DECISION UNIT GRADING DIOXIN FURAN REMOVAL



NOTES:

1. LOOSEN ASH IN THE NON-EXCAVATED DECISION UNITS THROUGHOUT THE SITE BY PLOWING/DISKING TO 10-INCHES AND REMOVE METALLIC DEBRIS FROM SURFACE TO 10-INCH DEPTH USING A MAGNET.
2. WHERE ASH THICKNESS IS GREATER THAN 10-INCHES, COMPLETE AN ADDITIONAL PASS OF THE PLOW DISK TO LOOSEN THE DEEPER ASH AND REMOVE METALLIC DEBRIS BELOW 10-INCHES USING A MAGNET. THE MAXIMUM DEPTH OF METALLIC DEBRIS REMOVAL IS ANTICIPATED TO BE 20 TO 24 INCHES.
3. DISPOSE METALLIC DEBRIS AT APPROPRIATE OFFSITE DISPOSAL FACILITY.
4. WHEEL ROLL AND LIGHTLY COMPACT DISTURBED DECISION UNITS THROUGHOUT THE SITE AND PLACE EROSION CONTROL MEASURES SUCH AS SILT FENCE AND/OR FIBER ROLLS AS APPROPRIATE.

- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

LEGEND:

----- APPROXIMATE SITE BOUNDARY

----- APPROXIMATE EXTENT OF ASH

----- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS

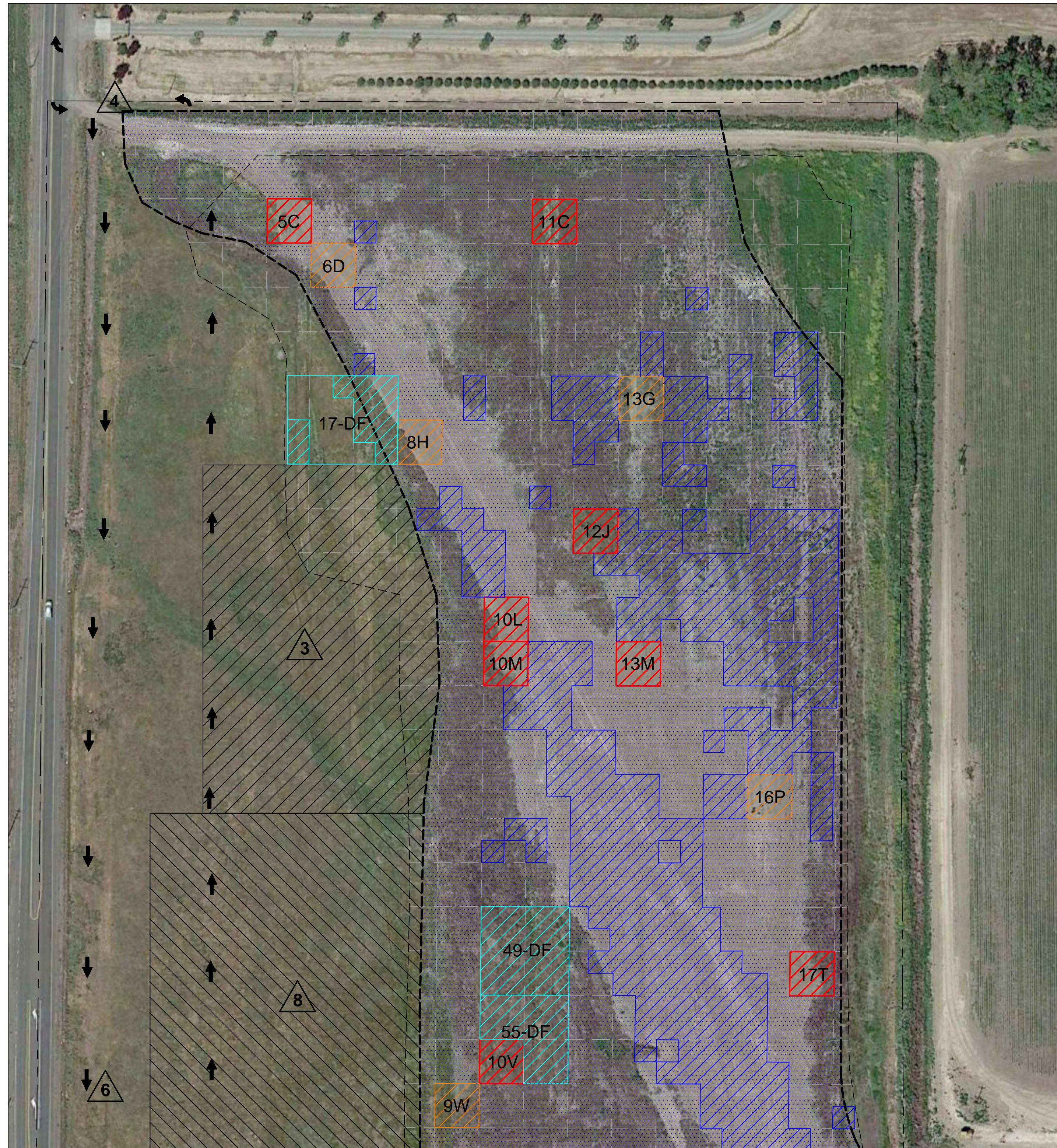
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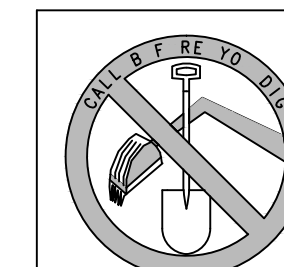
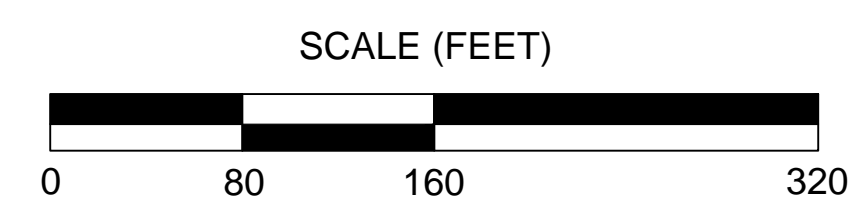
# 100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA

LIMITS OF METAL DEBRIS REMOVAL AREA FOR SURFACE TO 10" DEPTH

LIMITS OF METAL DEBRIS REMOVAL AREA TO 24" DEPTH



MATCHLINE - SEE SHEET 11



ATTENTION:  
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TOLL FREE AT 1-800-422-4133 TWO WORKING DAYS BEFORE YOU DIG

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|     |           |    |                                                                                                 |
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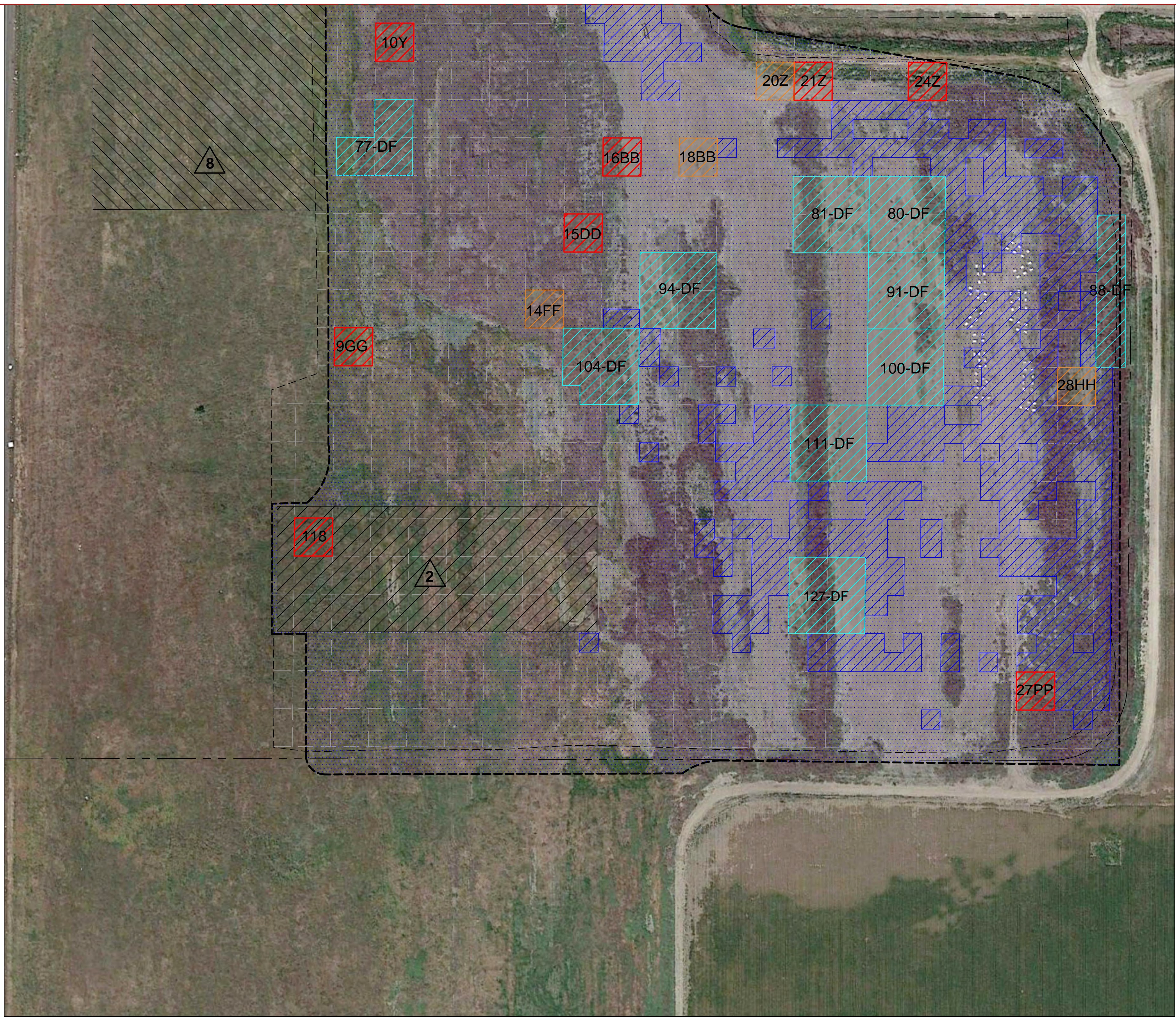
|      |      |
|------|------|
| DATE | DATE |
| DATE | DATE |

|                                                                         |
|-------------------------------------------------------------------------|
| REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS |
| LILLARD RANCH PROPERTY                                                  |
| GRADING PLAN-METALLIC DEBRIS REMOVAL                                    |

SHEET 10  
OF  
11 SHEETS



MATCHLINE - SEE SHEET 10



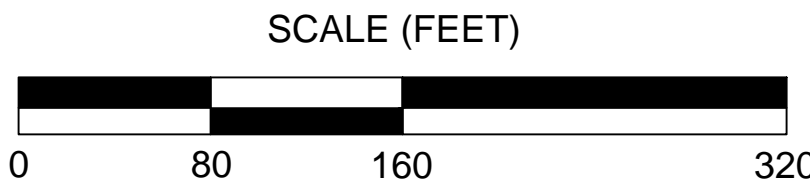
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- 2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

**LEGEND:**

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
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|                                                                                                   |
|---------------------------------------------------------------------------------------------------|
| REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS<br>LILLARD RANCH PROPERTY |
| GRADING PLAN-METALLIC DEBRIS REMOVAL                                                              |



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**APPENDIX C**  
**Site Risk Analysis**

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# STORM WATER POLLUTION PREVENTION PLAN

## Lillard Ranch Property – Ash Remediation Project Woodland, California

### Lillard Ranch Property – Ash Remediation Project Risk Determination

#### Risk Erosivity Factor Calculator:

#### Facility Information

- Start Date: 03/20/2017
- End Date: 05/26/2017
- Latitude: 38.5791
- Longitude: -121.7295

#### Erosivity Index Calculator Results

An erosivity index value Of **4.66** has been determined for the construction period of  
**03/20/2017 - 05/26/2017.**

#### Screenshots from SMARTS:

##### *Site Info:*

| Owner Info                                                                                                                                                                                                                                                                  | Developer Info | Site Info                                                                                                         | Risk | Addl. Site Info | Post Construction | Billing Info                       | Attachments | Certification                           | Reports | Inspections | Print | Status History | Linked Users | NOTs | COLs |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------|------|-----------------|-------------------|------------------------------------|-------------|-----------------------------------------|---------|-------------|-------|----------------|--------------|------|------|
| Site Information Same as Owner Info Same As Developer Info Clear Info If different, enter below                                                                                                                                                                             |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Site Name:                                                                                                                                                                                                                                                                  |                | Lillard Ranch Property-Ash Remediation Project *                                                                  |      |                 |                   | Contact First Name:                |             | Larry *                                 |         |             |       |                |              |      |      |
| Street Address:                                                                                                                                                                                                                                                             |                | 24998 Country Road, 102 *                                                                                         |      |                 |                   | Contact Last Name:                 |             | O'Neal *                                |         |             |       |                |              |      |      |
| Address Line 2:                                                                                                                                                                                                                                                             |                |                                                                                                                   |      |                 |                   | Title:                             |             |                                         |         |             |       |                |              |      |      |
| Latitude:                                                                                                                                                                                                                                                                   |                | 38.579122 *Longitude: -121.72955 *Lookup Map<br>(Decimal degrees only, minimum 5 significant digits Ex: 99.99999) |      |                 |                   | Phone:                             |             | 530-661-6095 *Ext: (999-999-9999)       |         |             |       |                |              |      |      |
| City:                                                                                                                                                                                                                                                                       |                | Davis *                                                                                                           |      |                 |                   | Emergency Phone:                   |             | Ext: (999-999-9999)                     |         |             |       |                |              |      |      |
| County:                                                                                                                                                                                                                                                                     |                | Los Angeles *                                                                                                     |      |                 |                   | E-mail:                            |             | larry.oneal@dtenergy.com *(abc@xyz.com) |         |             |       |                |              |      |      |
| Regional Board:                                                                                                                                                                                                                                                             |                | Region 4 - Los Angeles *                                                                                          |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| State/Zip:                                                                                                                                                                                                                                                                  |                | CA 95618 *                                                                                                        |      |                 |                   | Total Site Size:                   |             | 80 * Acres Sqft                         |         |             |       |                |              |      |      |
| Additional Information (Construction Specific)                                                                                                                                                                                                                              |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Total Area to be Disturbed:                                                                                                                                                                                                                                                 |                | 43 Acres *                                                                                                        |      |                 |                   | Percent of Total Disturbed:        |             | 54 %                                    |         |             |       |                |              |      |      |
| Imperviousness Before Construction:                                                                                                                                                                                                                                         |                | 2 % *                                                                                                             |      |                 |                   | Imperviousness After Construction: |             | 2 % *                                   |         |             |       |                |              |      |      |
| Tract Number(s):                                                                                                                                                                                                                                                            |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Mile Post Marker:                                                                                                                                                                                                                                                           |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Is the construction site part of larger common plan of development?                                                                                                                                                                                                         |                | Yes No *                                                                                                          |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Name of plan or development:                                                                                                                                                                                                                                                |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Construction Commencement Date:                                                                                                                                                                                                                                             |                | 03/20/2017 (mm/dd/yyyy)                                                                                           |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| Complete Grading Date:                                                                                                                                                                                                                                                      |                | 05/26/2017 (mm/dd/yyyy)                                                                                           |      |                 |                   | Complete Project Date:             |             | 05/26/2017 (mm/dd/yyyy)                 |         |             |       |                |              |      |      |
| Type of Construction                                                                                                                                                                                                                                                        |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input checked="" type="radio"/> Construction                                                                                                                                                                                                                               |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Reconstruction <input type="checkbox"/> Transportation <input type="checkbox"/> Utility:                                              |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input type="checkbox"/> Other: Remediation *                                                                                                                                                                                                                               |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input type="radio"/> Linear Utility Project                                                                                                                                                                                                                                |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground <input type="checkbox"/> Gas Line <input type="checkbox"/> Water/Sewer Line <input type="checkbox"/> Communication Line <input type="checkbox"/> Cable Line <input type="checkbox"/> Electrical |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |
| <input type="checkbox"/> Other: *                                                                                                                                                                                                                                           |                |                                                                                                                   |      |                 |                   |                                    |             |                                         |         |             |       |                |              |      |      |

# STORM WATER POLLUTION PREVENTION PLAN

## Lillard Ranch Property – Ash Remediation Project

### Woodland, California

*Risk Type 1:*

|            |                |           |             |                 |                   |              |             |               |         |             |       |                |              |      |      |
|------------|----------------|-----------|-------------|-----------------|-------------------|--------------|-------------|---------------|---------|-------------|-------|----------------|--------------|------|------|
| Owner Info | Developer Info | Site Info | <b>Risk</b> | Addl. Site Info | Post Construction | Billing Info | Attachments | Certification | Reports | Inspections | Print | Status History | Linked Users | NOTs | COIs |
|------------|----------------|-----------|-------------|-----------------|-------------------|--------------|-------------|---------------|---------|-------------|-------|----------------|--------------|------|------|

|                                                                                                                                                                                                                                   |                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>SEDIMENT RISK FACTOR WORKSHEET</b><br>Instructions: Enter R,K and LS factor values. System will calculate watershed erosion estimates and site sediment risk factor                                                            |                                                                                          |
| <b>A. Sediment Risk</b>                                                                                                                                                                                                           |                                                                                          |
| A) R Factor Value: <a href="#">(What's this?)</a>                                                                                                                                                                                 | <input type="text" value="4.66"/> *<br><a href="#">Erosivity Calculator</a>              |
| B) K Factor Value (weighted average, by area, for all site soils) <a href="#">(What's this?)</a><br>***If not using the SWRCB map(Populate K Factor) upload your analysis on the Attachment Tab prior to submitting to the SWRCB. | <input type="text" value="0.24"/> *<br><input type="button" value="Populate K Factor"/>  |
| C) LS Factor (weighted average, by area, for all slopes) <a href="#">(What's this?)</a> ***If not using the SWRCB map(Populate LS Factor) upload your analysis on the Attachment Tab prior to submitting to the SWRCB.            | <input type="text" value="0.19"/> *<br><input type="button" value="Populate LS Factor"/> |
| <b>Watershed Erosion Estimate (=R*K*LS) in tons/acre</b> <input type="text" value="0.21"/>                                                                                                                                        |                                                                                          |
| <b>Site Sediment Risk Factor</b><br>Low Sediment Risk: < 15 tons/acre<br>Medium Sediment Risk: >= 15 and <75 tons/acre<br>High Sediment Risk: >= 75 tons/acre<br><input type="text" value="Low"/>                                 |                                                                                          |

|                                                                                                                                                                              |                                                                                                                                                                                                                            |                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>RECEIVING WATER (RW) RISK FACTOR WORKSHEET</b>                                                                                                                            |                                                                                                                                                                                                                            |                                  |
| <b>A. Watershed Characteristics</b>                                                                                                                                          |                                                                                                                                                                                                                            |                                  |
| A.1.(a) Does the disturbed area discharge directly or indirectly to a 303(d) listed waterbody impaired by sediment?<br><div style="text-align: center;"><u>OR</u></div>      | <div><input type="button" value="Populate Receiving Water Risk"/><br/><input type="text" value="No"/> *<br/><br/>Yes = High, No = Low<br/><br/><a href="#">Statewide Map of High Receiving Water Risk Watersheds</a></div> | <input type="text" value="Low"/> |
| A.1.(b) Is the disturbed area located within a sub-watershed draining to a 303(d) listed waterbody impaired by sediment?<br><div style="text-align: center;"><u>OR</u></div> |                                                                                                                                                                                                                            |                                  |
| A.2. Is the disturbed area located within a planning watershed draining to a waterbody with designated beneficial uses of COLD, SPAWN AND MIGRATORY?                         |                                                                                                                                                                                                                            |                                  |

|                                      |      |                                     |        |
|--------------------------------------|------|-------------------------------------|--------|
| <b>C. Combined Risk Level Matrix</b> |      |                                     |        |
|                                      |      | <b>Sediment Risk</b>                |        |
|                                      |      | Low                                 | Medium |
| <b>Receiving Water Risk</b>          | Low  | Level1                              | Level2 |
|                                      | High | Level2                              | Level3 |
| Project Sediment Risk:               |      | <input type="text" value="Low"/>    |        |
| Project Receiving Water Risk:        |      | <input type="text" value="Low"/>    |        |
| Project Combined Risk:               |      | <input type="text" value="Level1"/> |        |

**APPENDIX D**  
**SWPPP Amendment Log**

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# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project  
Woodland, California

**AMENDMENT No.** \_\_\_\_\_

Reason for Amendment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date Amendment Implemented: \_\_\_\_\_

What specifically was amended in SWPPP?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I certify this SWPPP Amendment is being made by the responsible corporate officer or the authorized representative. A copy of the required delegation letter is included in the SWPPP.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_

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# STORM WATER POLLUTION PREVENTION PLAN

# Lillard Ranch Property – Ash Remediation Project

# Woodland, California

## AMENDMENT LOG

Project Name: Lillard Ranch Property – Ash Remediation Project

Project Number/ID: \_\_\_\_\_

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**APPENDIX E**  
**Permit Registration Documents**

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**APPENDIX F**  
**Non-Compliance Reporting**

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# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project  
Woodland, California

## NOTIFICATION OF ANTICIPATED NON-COMPLIANCE

This form will be used to report instances of anticipated non-compliance pursuant to Section IV, Special Provisions of the Order. The LRP must provide advanced notice to the local Regional Water Quality Control Board and local Storm Water Management Agency (see Appendix 7 for the relevant contact information).

WDID Number: \_\_\_\_\_

In accordance/compliance with the **State Water Resources Control Board** (SWRCB) Order No. 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, the following discharge is anticipated:

|                                                                                                            |
|------------------------------------------------------------------------------------------------------------|
| Nature of planned change in construction activity that may result in non-compliance with CGP requirements: |
| <br><br><br><br><br><br><br><br><br><br>                                                                   |

|                                                    |
|----------------------------------------------------|
| Date, time, and location of anticipated discharge: |
| <br><br><br><br><br><br><br><br><br><br>           |

\_\_\_\_\_  
Name of LRP or Approved Signatory

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

\_\_\_\_\_  
Telephone Number

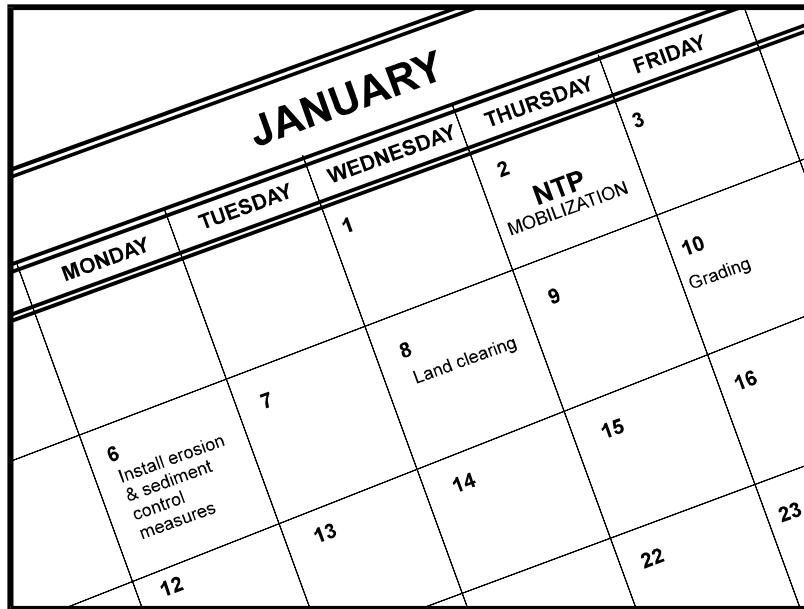
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**APPENDIX G**  
**BMP Fact Sheets**

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## Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

## Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

## Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

## Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 | <input checked="" type="checkbox"/> |
| WE | Wind Erosion Control                             | <input checked="" type="checkbox"/> |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

None

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to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
  - Erosion control BMPs
  - Sediment control BMPs
  - Tracking control BMPs
  - Wind erosion control BMPs
  - Non-stormwater BMPs
  - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
  - Sequence trenching activities so that most open portions are closed before new trenching begins.
  - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
  - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year round, and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

## Costs

Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost effectiveness of scheduling techniques should be compared with the other less effective erosion and sedimentation controls to achieve a cost effective balance.

## Inspection and Maintenance

- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

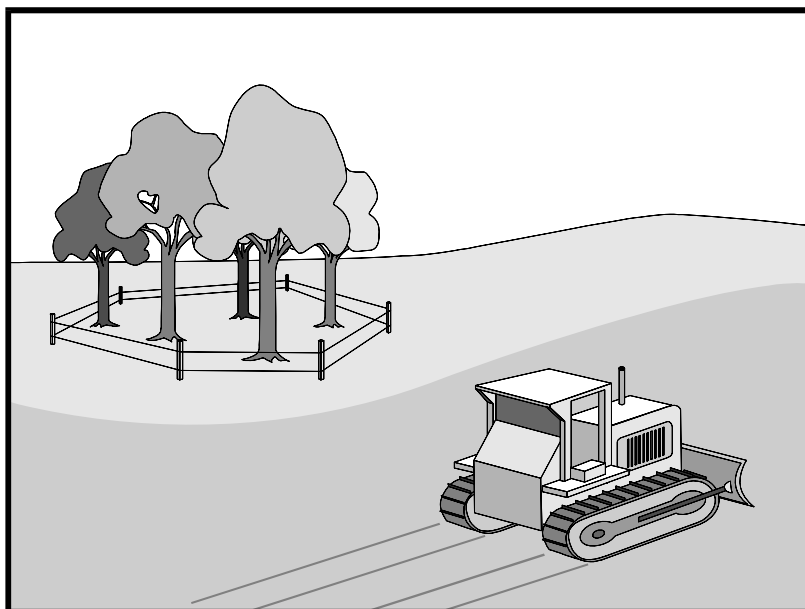
## References

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.



# Preservation Of Existing Vegetation EC-2



## Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

## Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Objective**
- ☐ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

None

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# **Preservation Of Existing Vegetation EC-2**

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## **Limitations**

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

## **Implementation**

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

## **Timing**

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

## **Design and Layout**

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
  - Orange colored plastic mesh fencing works well.
  - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

# **Preservation Of Existing Vegetation EC-2**

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## **Costs**

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of \$10,000 per tree.

## **Inspection and Maintenance**

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a trees root zone by punching holes 12 in. deep with an iron bar, and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization
  - Fertilize stressed or damaged broadleaf trees to aid recovery.
  - Fertilize trees in the late fall or early spring.

# **Preservation Of Existing Vegetation EC-2**

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- Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.
- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

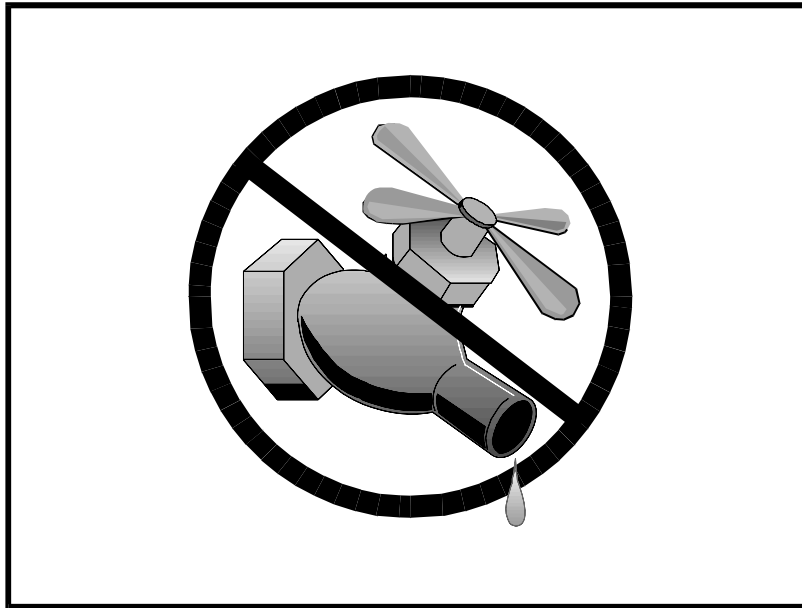
## **References**

County of Sacramento Tree Preservation Ordinance, September 1981.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



## Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

## Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

## Limitations

- None identified.

## Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                | <input checked="" type="checkbox"/> |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

None

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- Direct construction water runoff to areas where it can soak into the ground or be collected and reused.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

## **Costs**

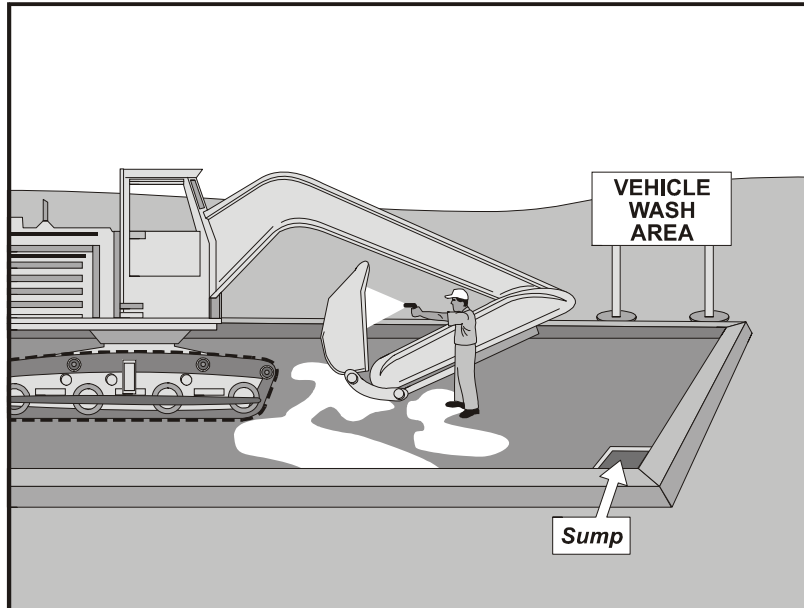
The cost is small to none compared to the benefits of conserving water.

## **Inspection and Maintenance**

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occurring.
- Repair water equipment as needed to prevent unintended discharges.
  - Water trucks
  - Water reservoirs (water buffalos)
  - Irrigation systems
  - Hydrant connections

## **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



## Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

## Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

## Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

## Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                | <input checked="" type="checkbox"/> |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried, and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

## Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

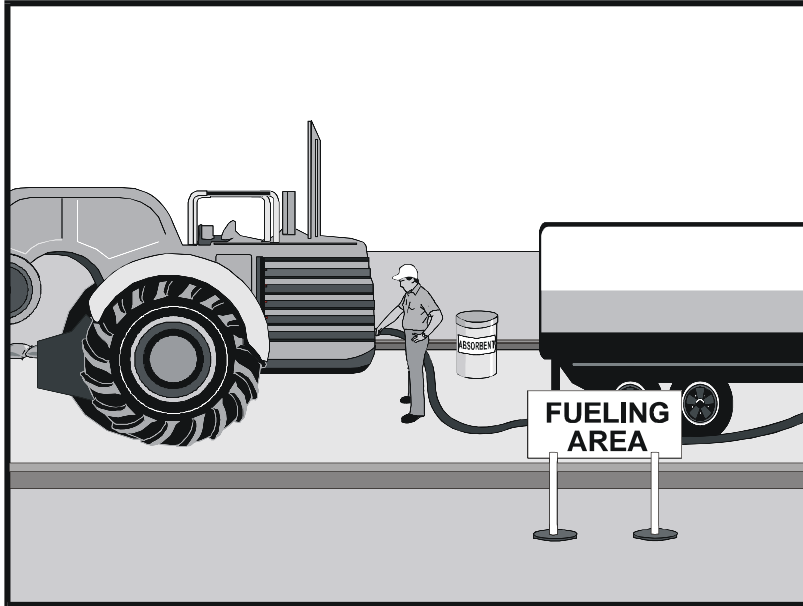
## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

## References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.



## Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

## Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

## Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

## Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage “topping-off” of fuel tanks.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                | <input checked="" type="checkbox"/> |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       |                                     |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       |                                     |

## Potential Alternatives

None

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- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runoff and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

## Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

## Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.

- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

## References

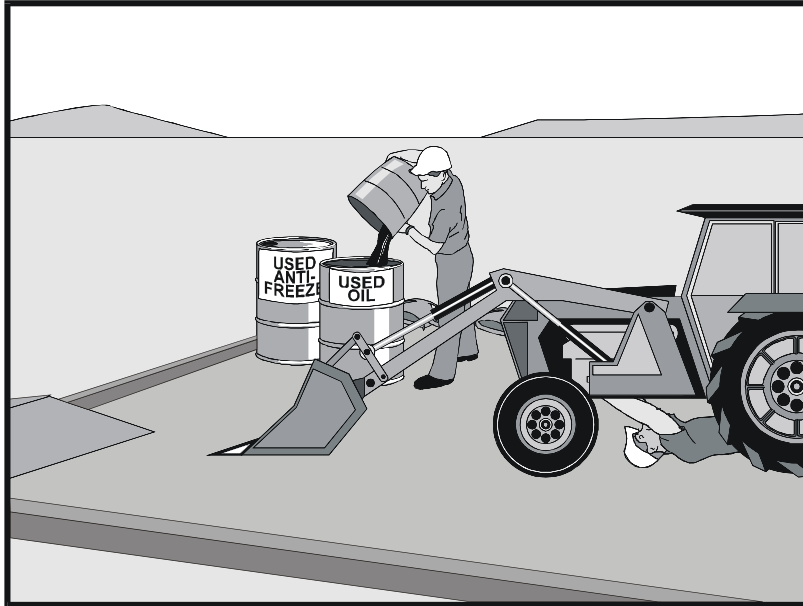
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

# Vehicle & Equipment Maintenance NS-10



## Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a “dry and clean site”. The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

## Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

## Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8,

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                | <input checked="" type="checkbox"/> |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       |                                     |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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# Vehicle & Equipment Maintenance NS-10

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Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

## Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runoff and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.



# Vehicle & Equipment Maintenance NS-10

---

- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

## ***Safer Alternative Products***

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an “environmentally friendly” label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

## ***Waste Reduction***

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The “chlor” term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

## ***Recycling and Disposal***

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like, trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

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.

## ***Costs***

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

# Vehicle & Equipment Maintenance NS-10

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## Inspection and Maintenance

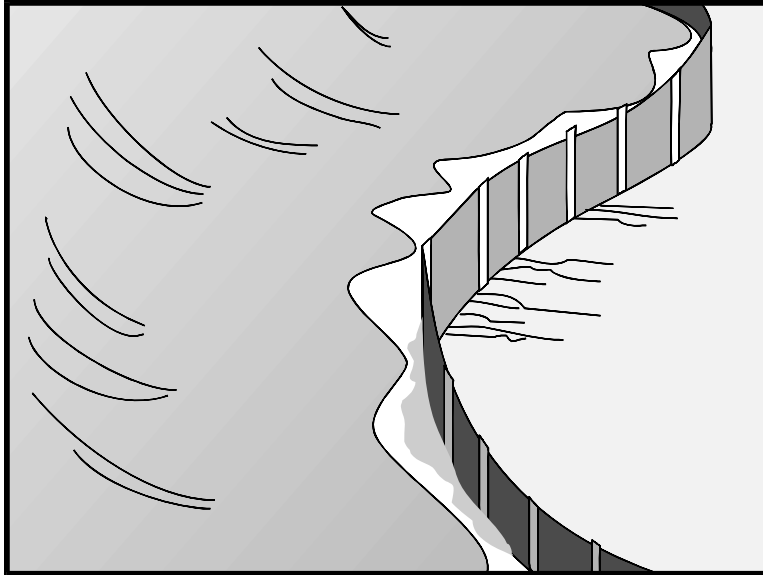
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



## Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains water, promoting sedimentation of coarse sediment behind the fence. Silt fence does not retain soil fine particles like clays or silts.

## Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences should not be used in locations where the flow is concentrated. Silt fences should always be used in combination with erosion controls. Suitable applications include:

- At perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

## Targeted Constituents

|                            |                                     |
|----------------------------|-------------------------------------|
| Sediment (coarse sediment) | <input checked="" type="checkbox"/> |
| Nutrients                  |                                     |
| Trash                      |                                     |
| Metals                     |                                     |
| Bacteria                   |                                     |
| Oil and Grease             |                                     |
| Organics                   |                                     |

## Potential Alternatives

- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berm
- SE-12 Manufactured Linear Sediment Controls
- SE-13 Compost Socks and Berms
- SE-14 Biofilter Bags

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## Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard.
- Do not use silt fence to divert water flows or place across any contour line.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Must be trenched and keyed in.
- Not intended for use as a substitute for Fiber Rolls (SE-5), when fiber rolls are being used as a slope interruption device.
- Do not use on slopes subject to creeping, slumping, or landslides.

## Implementation

### *General*

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap coarse sediment by intercepting and detaining sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Silt fence should be used in combination with erosion controls up-slope in order to provide the most effective sediment control.
- Silt fence alone is not effective at reducing turbidity. (Barrett and Malina, 2004)
- Designers should consider diverting sediment laden water to a temporary sediment basin or trap. (EPA, 2012)
- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft<sup>2</sup> of ponding area should be provided for every acre draining to the fence.
- Efficiency of silt fences is primarily dependent on the detention time of the runoff behind the control. (Barrett and Malina, 2004)
- The drainage area above any fence should not exceed a quarter of an acre. (Rule of Thumb- 100-feet of silt fence per 10,000 square feet of disturbed area.) (EPA 2012)

- The maximum length of slope draining to any point along the silt fence should be 100 ft per foot of silt fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area draining to the silt fence is permanently stabilized, after which, the silt fence fabric and posts should be removed and properly disposed.
- J-Hooks, which have ends turning up the slope to break up long runs of fence and provide multiple storage areas that work like mini-retention areas, may be used to increase the effectiveness of silt fence.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

## ***Design and Layout***

In areas where high winds are anticipated the fence should be supported by a plastic or wire mesh. The geotextile fabric of the silt fence should contain ultraviolet inhibitors and stabilizers to provide longevity equivalent to the project life or replacement schedule.

- Layout in accordance with the attached figures.
- For slopes that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to protect silt fence from rocks (e.g., rockfall netting) ensure the integrity of the silt fence installation.

## ***Standard vs. Heavy Duty Silt Fence***

### ***Standard Silt Fence***

- Generally applicable in cases where the area draining to fence produces moderate sediment loads.

### ***Heavy Duty Silt Fence***

- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
- Use is generally limited to areas affected by high winds.
- Area draining to fence produces moderate sediment loads.

## ***Materials***

### ***Standard Silt Fence***

- Silt fence material should be woven geotextile with a minimum width of 36 in. The fabric should conform to the requirements in ASTM designation D6461.
- Wooden stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the

thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

### *Heavy-Duty Silt Fence*

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts instead of wood stakes.

### **Installation Guidelines – Traditional Method**

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1 in. long. The mesh should extend into the trench.
- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.
- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with native material and compacted.
- Construct the length of each reach so that the change in base elevation along the reach does not exceed  $\frac{1}{3}$  the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of  $\frac{1}{3}$  and a maximum of  $\frac{1}{2}$  the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

## ***Installation Guidelines - Static Slicing Method***

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 inches into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the geotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
  - Ease of installation (most often done with a 2 person crew).
  - Minimal soil disturbance.
  - Better level of compaction along fence, less susceptible to undercutting
  - Uniform installation.
- Limitations:
  - Does not work in shallow or rocky soils.
  - Complete removal of geotextile material after use is difficult.
  - Be cautious when digging near potential underground utilities.

## **Costs**

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is \$7 per linear foot based on vendor research. Range of cost is \$3.50 - \$9.10 per linear foot.

## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches 1/3 of the barrier height.
- Silt fences should be left in place until the upgradient area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.



- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

## References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Monitoring Data on Effectiveness of Sediment Control Techniques, Proceedings of World Water and Environmental Resources Congress, Barrett M. and Malina J. 2004.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), USEPA, 1990.

Southeastern Wisconsin Regional Planning Commission (SWRPC). Costs of Urban Nonpoint Source Water Pollution Control Measures. Technical Report No. 31. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI. 1991.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

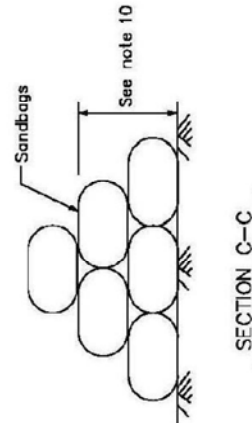
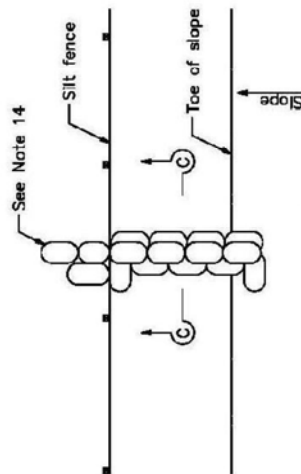
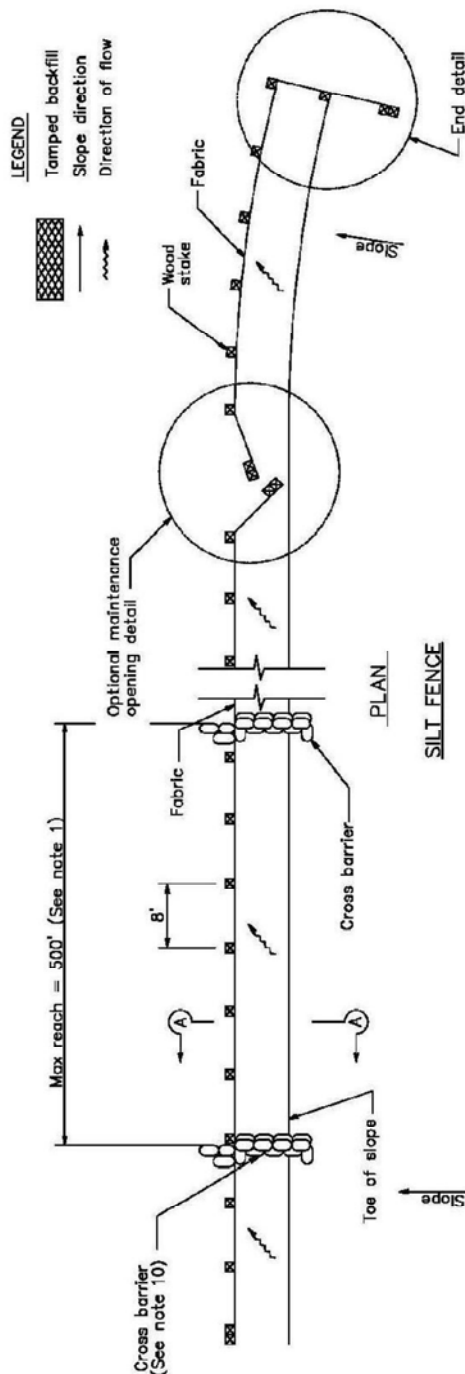
U.S. Environmental Protection Agency (USEPA). Stormwater Best Management Practices: Silt Fences. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 2012.

U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

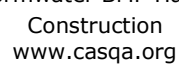
Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

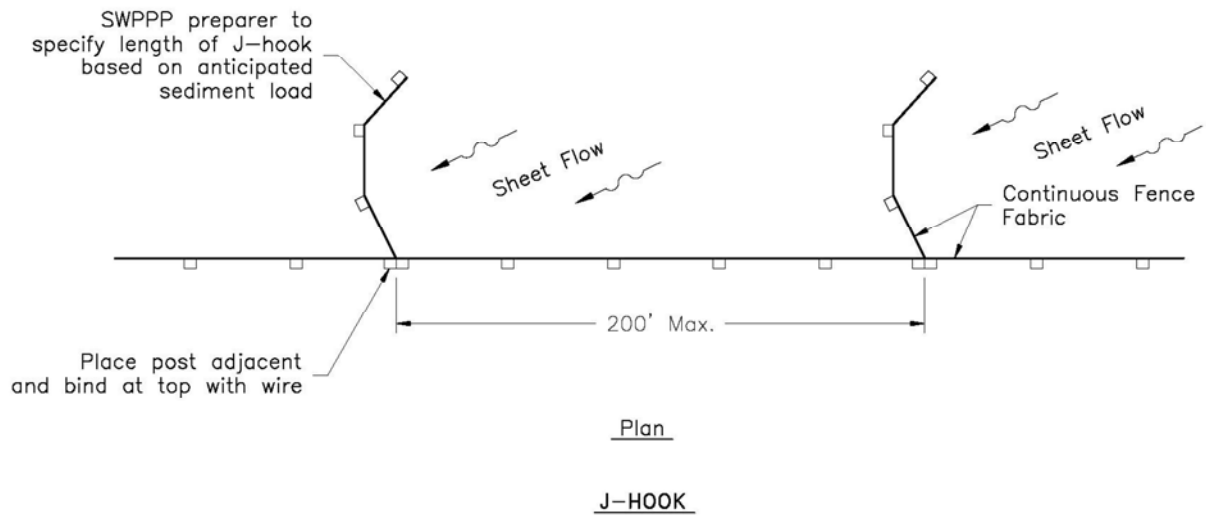


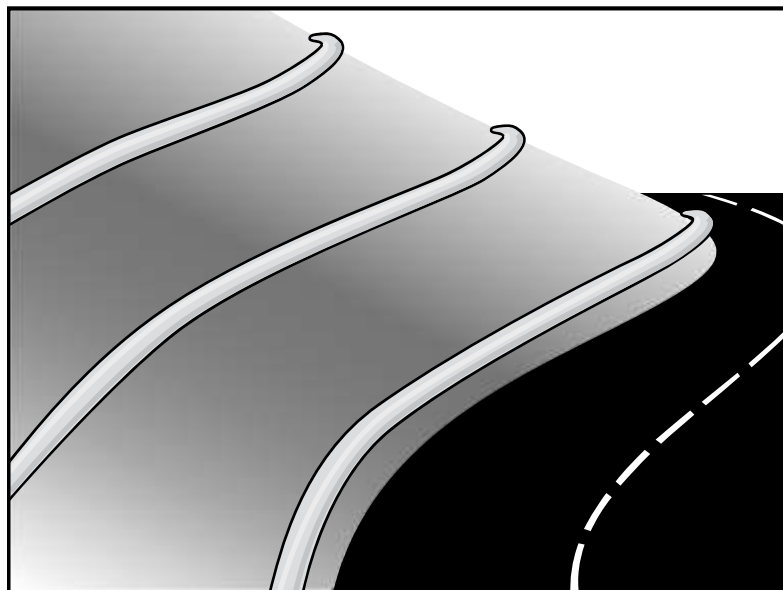
## NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed  $1/3$  the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The last 8'-0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes are full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of  $1/3$  and a maximum of  $1/2$  the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3-4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.

**SE-1**







## Description and Purpose

A fiber roll consists of straw, coir, or other biodegradable materials bound into a tight tubular roll wrapped by netting, which can be photodegradable or natural. Additionally, gravel core fiber rolls are available, which contain an imbedded ballast material such as gravel or sand for additional weight when staking the rolls are not feasible (such as use as inlet protection). When fiber rolls are placed at the toe and on the face of slopes along the contours, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (through sedimentation). By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.

## Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- As check dams in unlined ditches with minimal grade.
- Down-slope of exposed soil areas.
- At operational storm drains as a form of inlet protection.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

- SE-1 Silt Fence
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-12 Manufactured Linear Sediment Controls
- SE-14 Biofilter Bags

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- Around temporary stockpiles.

## **Limitations**

- Fiber rolls are not effective unless trenched in and staked.
- Not intended for use in high flow situations.
- Difficult to move once saturated.
- If not properly staked and trenched in, fiber rolls could be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.
- Rolls typically function for 12-24 months depending upon local conditions.

## **Implementation**

### ***Fiber Roll Materials***

- Fiber rolls should be prefabricated.
- Fiber rolls may come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll. Fiber rolls impregnated with PAM provide additional sediment removal capabilities and should be used in areas with fine, clayey or silty soils to provide additional sediment removal capabilities. Monitoring may be required for these installations.
- Fiber rolls are made from weed free rice straw, flax, or a similar agricultural material bound into a tight tubular roll by netting.
- Typical fiber rolls vary in diameter from 9 in. to 20 in. Larger diameter rolls are available as well.

### ***Installation***

- Locate fiber rolls on level contours spaced as follows:
  - Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
  - Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
  - Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).
- Prepare the slope before beginning installation.
- Dig small trenches across the slope on the contour. The trench depth should be  $\frac{1}{4}$  to  $\frac{1}{3}$  of the thickness of the roll, and the width should equal the roll diameter, in order to provide area to backfill the trench.

- It is critical that rolls are installed perpendicular to water movement, and parallel to the slope contour.
- Start building trenches and installing rolls from the bottom of the slope and work up.
- It is recommended that pilot holes be driven through the fiber roll. Use a straight bar to drive holes through the roll and into the soil for the wooden stakes.
- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
- Stake fiber rolls into the trench.
  - Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.
  - Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.
- See typical fiber roll installation details at the end of this fact sheet.

## **Removal**

- Fiber rolls can be left in place or removed depending on the type of fiber roll and application (temporary vs. permanent installation). Typically, fiber rolls encased with plastic netting are used for a temporary application because the netting does not biodegrade. Fiber rolls used in a permanent application are typically encased with a biodegradeable material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance.
- Temporary installations should only be removed when up gradient areas are stabilized per General Permit requirements, and/or pollutant sources no longer present a hazard. But, they should also be removed before vegetation becomes too mature so that the removal process does not disturb more soil and vegetation than is necessary.

## **Costs**

Material costs for regular fiber rolls range from \$20 - \$30 per 25 ft roll.

Material costs for PAM impregnated fiber rolls range between 7.00-\$9.00 per linear foot, based upon vendor research.

## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP should be periodically removed



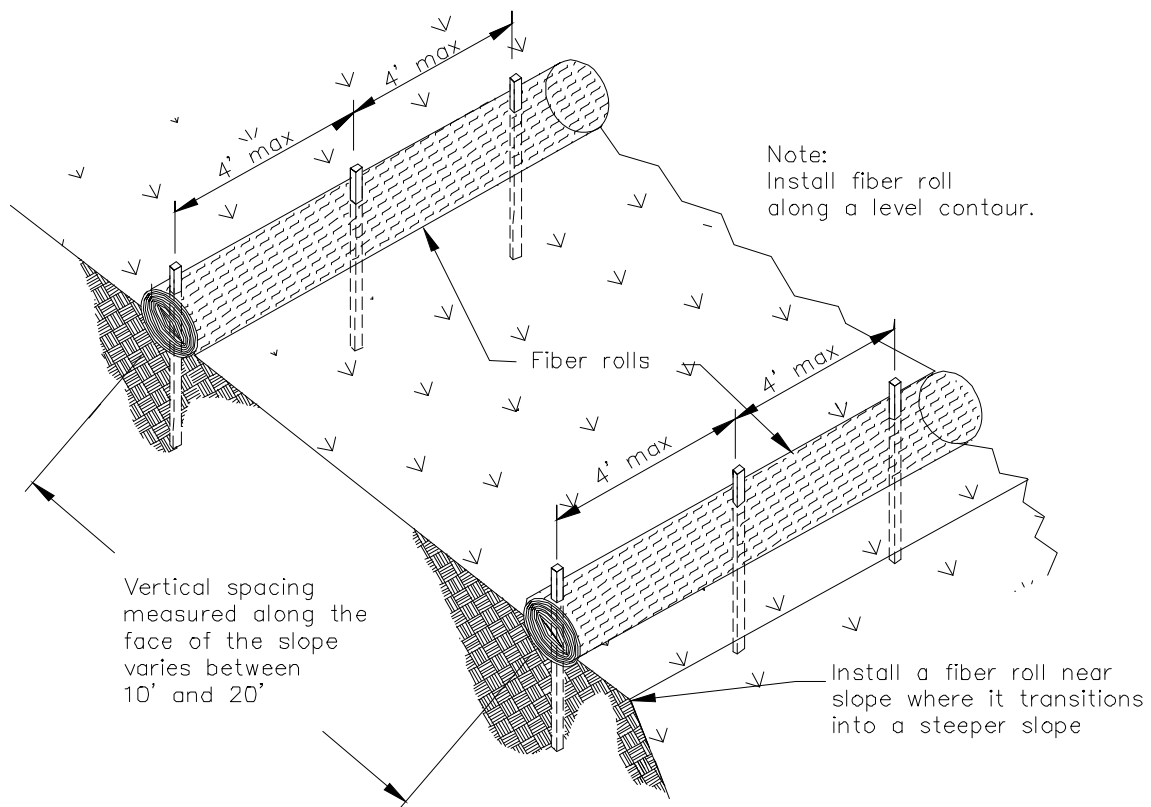
in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-third the designated sediment storage depth.

- If fiber rolls are used for erosion control, such as in a check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.
- Repair any rills or gullies promptly.

## References

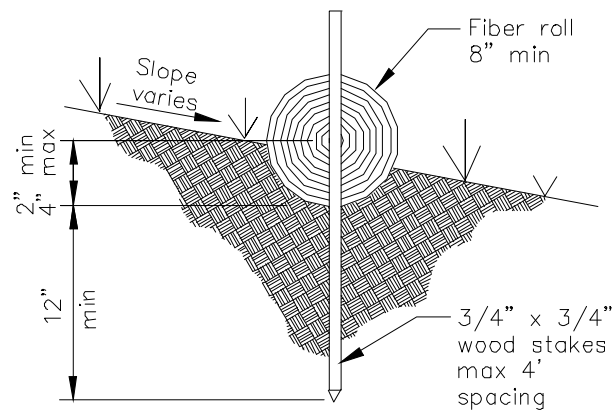
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



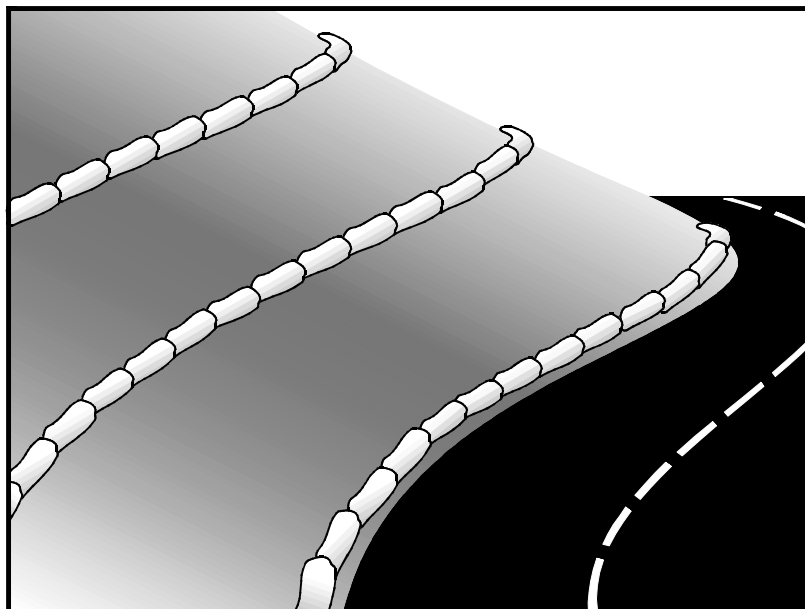
TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.



## Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

## Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As a linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

- SE-1 Silt Fence
- SE-5 Fiber Roll
- SE-8 Sandbag Barrier
- SE-12 Temporary Silt Dike
- SE-14 Biofilter Bags

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- At the top of slopes to divert runoff away from disturbed slopes.
- As chevrons (small check dams) across mildly sloped construction roads. For use check dam use in channels, see SE-4, Check Dams.

## Limitations

- Gravel berms may be difficult to remove.
- Removal problems limit their usefulness in landscaped areas.
- Gravel bag berm may not be appropriate for drainage areas greater than 5 acres.
- Runoff will pond upstream of the berm, possibly causing flooding if sufficient space does not exist.
- Degraded gravel bags may rupture when removed, spilling contents.
- Installation can be labor intensive.
- Durability of gravel bags is somewhat limited and bags may need to be replaced when installation is required for longer than 6 months.
- Easily damaged by construction equipment.
- When used to detain concentrated flows, maintenance requirements increase.

## Implementation

### *General*

A gravel bag berm consists of a row of open graded gravel-filled bags placed on a level contour. When appropriately placed, a gravel bag berm intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding allows sediment to settle. The open graded gravel in the bags is porous, which allows the ponded runoff to flow slowly through the bags, releasing the runoff as sheet flows. Gravel bag berms also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils. Gravel bag berms are similar to sand bag barriers, but are more porous. Generally, gravel bag berms should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.

### *Design and Layout*

- Locate gravel bag berms on level contours.
- When used for slope interruption, the following slope/sheet flow length combinations apply:
  - Slope inclination of 4:1 (H:V) or flatter: Gravel bags should be placed at a maximum interval of 20 ft, with the first row near the slope toe.
  - Slope inclination between 4:1 and 2:1 (H:V): Gravel bags should be placed at a maximum interval of 15 ft. (a closer spacing is more effective), with the first row near the slope toe.

Slope inclination 2:1 (H:V) or greater: Gravel bags should be placed at a maximum interval of 10 ft. (a closer spacing is more effective), with the first row near the slope toe.

- Turn the ends of the gravel bag barriers up slope to prevent runoff from going around the berm.
- Allow sufficient space up slope from the gravel bag berm to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, gravel bag barriers should be set back from the slope toe to facilitate cleaning. Where specific site conditions do not allow for a set-back, the gravel bag barrier may be constructed on the toe of the slope. To prevent flows behind the barrier, bags can be placed perpendicular to a berm to serve as cross barriers.
- Drainage area should not exceed 5 acres.
- In Non-Traffic Areas:
  - Height = 18 in. maximum
  - Top width = 24 in. minimum for three or more layer construction
  - Top width = 12 in. minimum for one or two layer construction
  - Side slopes = 2:1 (H:V) or flatter
- In Construction Traffic Areas:
  - Height = 12 in. maximum
  - Top width = 24 in. minimum for three or more layer construction.
  - Top width = 12 in. minimum for one or two layer construction.
  - Side slopes = 2:1 (H:V) or flatter.
- Butt ends of bags tightly.
- On multiple row, or multiple layer construction, overlap butt joints of adjacent row and row beneath.
- Use a pyramid approach when stacking bags.

## **Materials**

- **Bag Material:** Bags should be woven polypropylene, polyethylene or polyamide fabric or burlap, minimum unit weight of 4 ounces/yd<sup>2</sup>, Mullen burst strength exceeding 300 lb/in<sup>2</sup> in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.

- **Bag Size:** Each gravel-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal, and may vary based on locally available materials.
- **Fill Material:** Fill material should be 0.5 to 1 in. crushed rock, clean and free from clay, organic matter, and other deleterious material, or other suitable open graded, non-cohesive, porous gravel.

## Costs

Material costs for gravel bags are average and are dependent upon material availability. \$2.50-3.00 per filled gravel bag is standard based upon vendor research.

## Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Gravel bags exposed to sunlight will need to be replaced every two to three months due to degrading of the bags.
- Reshape or replace gravel bags as needed.
- Repair washouts or other damage as needed.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Remove gravel bag berms when no longer needed and recycle gravel fill whenever possible and properly dispose of bag material. Remove sediment accumulation and clean, re-grade, and stabilize the area.

## References

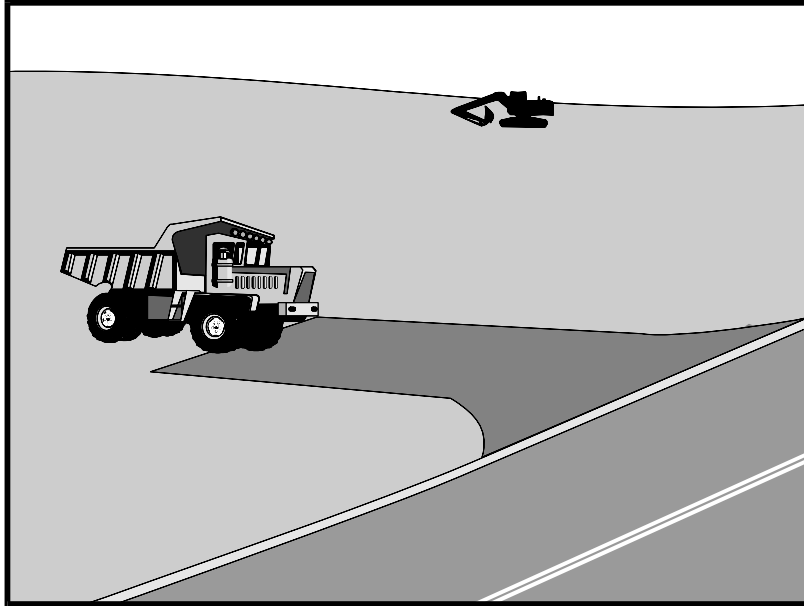
Handbook of Steel Drainage and Highway Construction, American Iron and Steel Institute, 1983.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Pollution Plan Handbook, First Edition, State of California, Department of Transportation Division of New Technology, Materials and Research, October 1992.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

# Stabilized Construction Entrance/Exit TC-1



## Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

## Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

## Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 | <input checked="" type="checkbox"/> |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

None

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# Stabilized Construction Entrance/Exit TC-1

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## Implementation

### *General*

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

### *Design and Layout*

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft or maximum site will allow, and 10 ft minimum width or to accommodate traffic.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.

# **Stabilized Construction Entrance/Exit TC-1**

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- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

## **Costs**

Average annual cost for installation and maintenance may vary from \$1,200 to \$4,800 each, averaging \$2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from \$1,200 - \$6,000 each, averaging \$3,600 per entrance.

## **References**

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

# **Stabilized Construction Entrance/Exit TC-1**

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National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

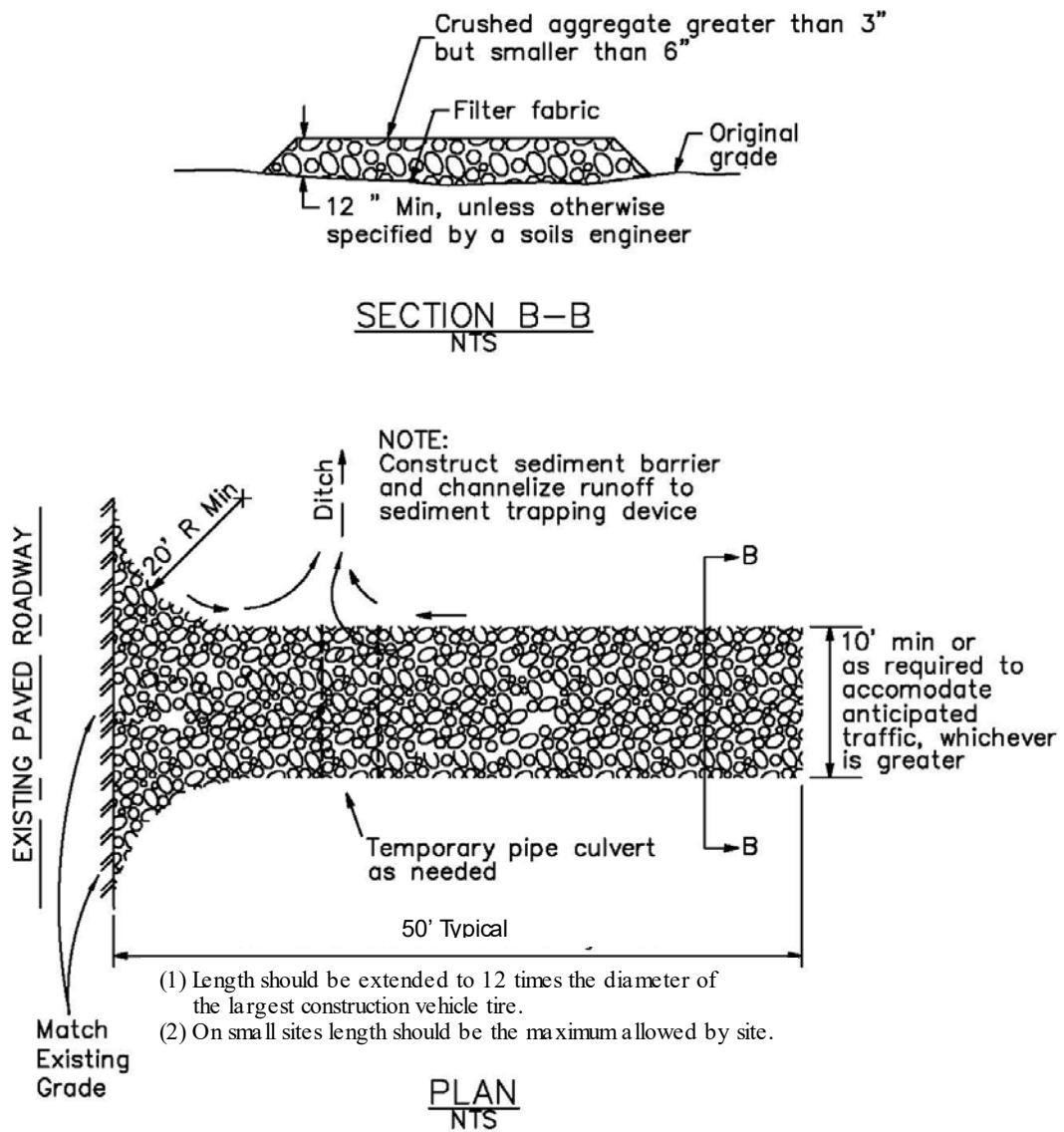
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

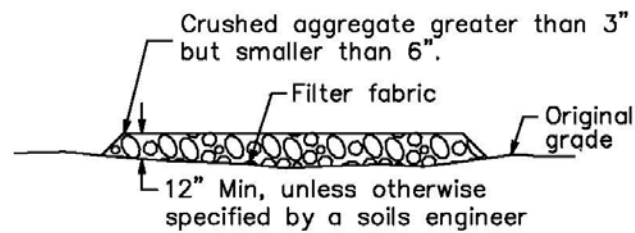
Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

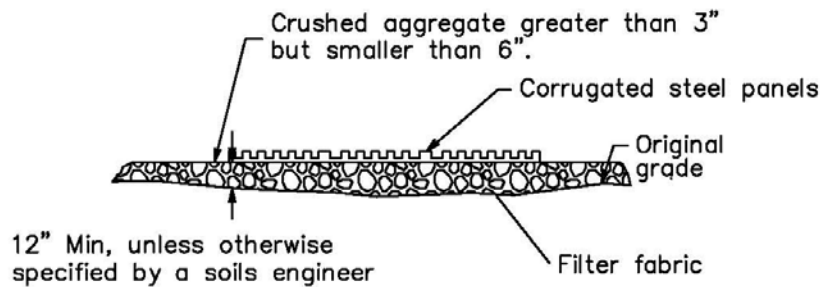
# Stabilized Construction Entrance/Exit TC-1



# Stabilized Construction Entrance/Exit TC-1

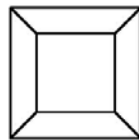


SECTION B-B  
NTS

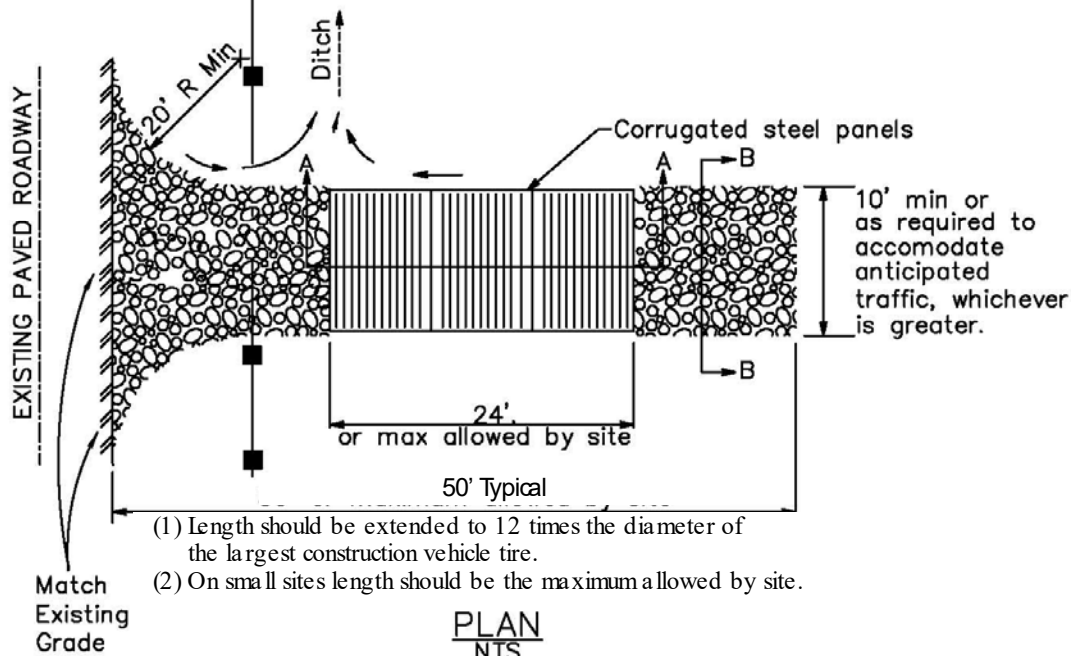


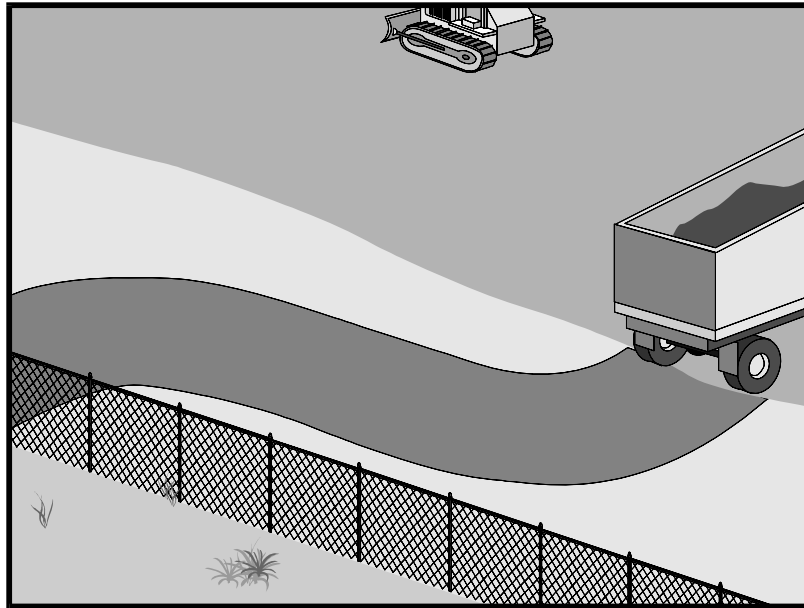
SECTION A-A  
NOT TO SCALE

NOTE:  
Construct sediment barrier and channelize runoff to sediment trapping device



Sediment trapping device





## Description and Purpose

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

## Suitable Applications

This BMP should be applied for the following conditions:

- Temporary Construction Traffic:
  - Phased construction projects and offsite road access
  - Construction during wet weather
- Construction roadways and detour roads:
  - Where mud tracking is a problem during wet weather
  - Where dust is a problem during dry weather
  - Adjacent to water bodies
  - Where poor soils are encountered

## Limitations

- The roadway must be removed or paved when construction is complete.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  | <input checked="" type="checkbox"/> |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 | <input checked="" type="checkbox"/> |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

None

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- Certain chemical stabilization methods may cause stormwater or soil pollution and should not be used. See WE-1, Wind Erosion Control.
- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.
- Materials will likely need to be removed prior to final project grading and stabilization.
- Use of this BMP may not be applicable to very short duration projects.

## Implementation

### *General*

Areas that are graded for construction vehicle transport and parking purposes are especially susceptible to erosion and dust. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires that generate significant quantities of sediment that may pollute nearby streams or be transported offsite on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Efficient construction road stabilization not only reduces onsite erosion but also can significantly speed onsite work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather

### *Installation/Application Criteria*

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems. Temporary gravel roadway should be considered during the rainy season and on slopes greater than 5%.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slope should not exceed 15%. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway in the case of a crowned section or one side in the case of a super elevated section. Simple gravel berms without a trench can also be used.

Installed inlets should be protected to prevent sediment laden water from entering the storm sewer system (SE-10, Storm Drain Inlet Protection). In addition, the following criteria should be considered.

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15%.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (WE-1, Wind Erosion Control).
- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support heaviest vehicles and equipment that will use it.



- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- Coordinate materials with those used for stabilized construction entrance/exit points.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.
- Periodically apply additional aggregate on gravel roads.
- Active dirt construction roads are commonly watered three or more times per day during the dry season.

## Costs

Gravel construction roads are moderately expensive, but cost is often balanced by reductions in construction delay. No additional costs for dust control on construction roads should be required above that needed to meet local air quality requirements.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

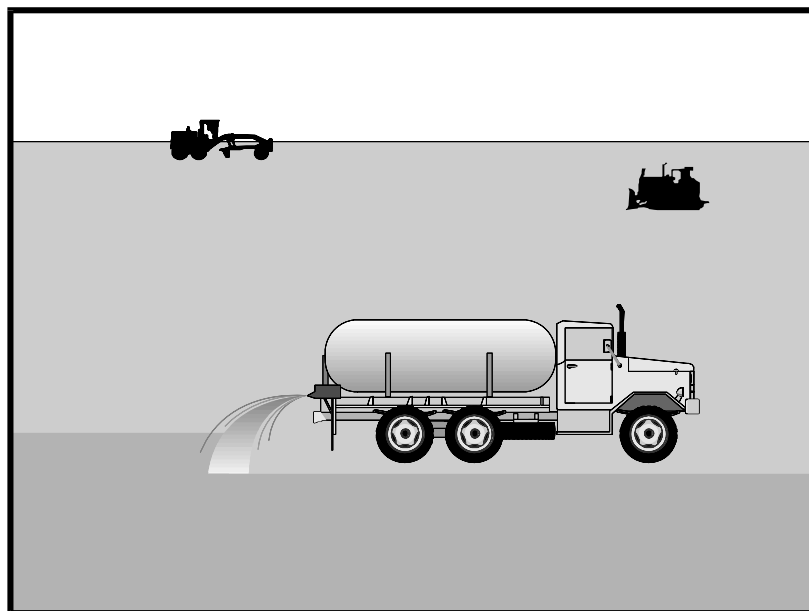
Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



## Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

## Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             | <input checked="" type="checkbox"/> |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control |                                     |

## Legend:

- ☒ Primary Category
- ☒ Secondary Category

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      |                                     |
| Trash          |                                     |
| Metals         |                                     |
| Bacteria       |                                     |
| Oil and Grease |                                     |
| Organics       |                                     |

## Potential Alternatives

EC-5 Soil Binders

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- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

## Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

## Implementation

### *Dust Control Practices*

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

Chemical dust suppressants include: mulch and fiber based dust palliatives (e.g. paper mulch with gypsum binder), salts and brines (e.g. calcium chloride, magnesium chloride), non-petroleum based organics (e.g. vegetable oil, lignosulfonate), petroleum based organics (e.g. asphalt emulsion, dust oils, petroleum resins), synthetic polymers (e.g. polyvinyl acetate, vinyls, acrylic), clay additives (e.g. bentonite, montmorillonite) and electrochemical products (e.g. enzymes, ionic products).

| Site Condition                         | Dust Control Practices |          |                            |                           |                   |                                                             |                  |                                   |
|----------------------------------------|------------------------|----------|----------------------------|---------------------------|-------------------|-------------------------------------------------------------|------------------|-----------------------------------|
|                                        | Permanent Vegetation   | Mulching | Wet Suppression (Watering) | Chemical Dust Suppression | Gravel or Asphalt | Temporary Gravel Construction Entrances/Equipment Wash Down | Synthetic Covers | Minimize Extent of Disturbed Area |
| Disturbed Areas not Subject to Traffic | X                      | X        | X                          | X                         | X                 |                                                             |                  | X                                 |
| Disturbed Areas Subject to Traffic     |                        |          | X                          | X                         | X                 | X                                                           |                  | X                                 |
| Material Stockpiles                    |                        | X        | X                          | X                         |                   |                                                             | X                | X                                 |
| Demolition                             |                        |          | X                          |                           |                   | X                                                           | X                |                                   |
| Clearing/Excavation                    |                        |          | X                          | X                         |                   |                                                             |                  | X                                 |
| Truck Traffic on Unpaved Roads         |                        |          | X                          | X                         | X                 | X                                                           | X                |                                   |
| Tracking                               |                        |          |                            |                           | X                 | X                                                           |                  |                                   |

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (see EC-1, Scheduling).
- Quickly treat exposed soils using water, mulching, chemical dust suppressants, or stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Restrict construction traffic to stabilized roadways within the project site, as practicable.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.
- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality

Control Board (RWQCB) requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and wheel wash areas.
- Stabilize inactive areas of construction sites using temporary vegetation or chemical stabilization methods.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater and should meet all applicable regulatory requirements.

## Costs

Installation costs for water and chemical dust suppression vary based on the method used and the length of effectiveness. Annual costs may be high since some of these measures are effective for only a few hours to a few days.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Check areas protected to ensure coverage.
- Most water-based dust control measures require frequent application, often daily or even multiple times per day. Obtain vendor or independent information on longevity of chemical dust suppressants.

## References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

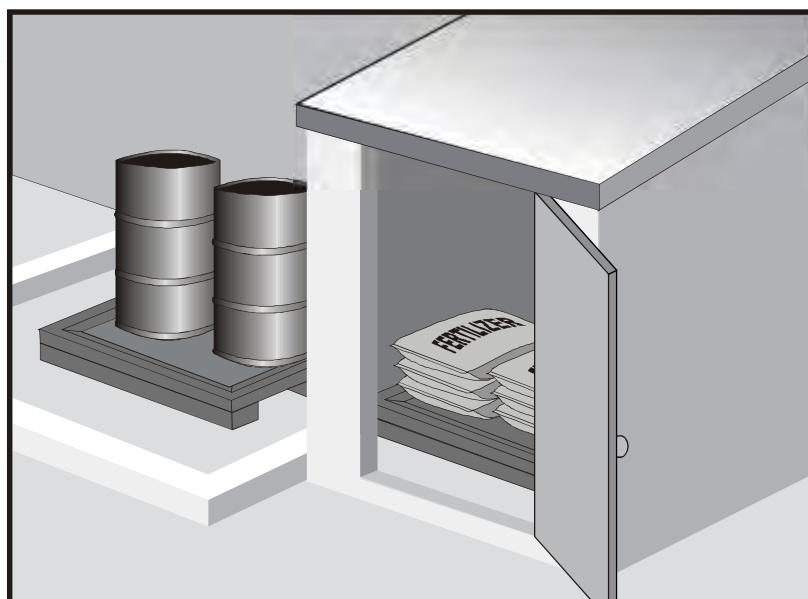
California Air Pollution Control Laws, California Air Resources Board, updated annually.

Construction Manual, Chapter 4, Section 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative", California Department of Transportation (Caltrans), July 2001.

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM<sub>10</sub>), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.





## Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

## Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

## Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         | <input checked="" type="checkbox"/> |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

## Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

## Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area that will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.

- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Keep ample spill cleanup supplies appropriate for the materials being stored. Ensure that cleanup supplies are in a conspicuous, labeled area.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose of materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

## ***Material Storage Areas and Practices***

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be covered prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or completely enclosed storage sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous wastes.

## ***Material Delivery Practices***

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

## ***Spill Cleanup***

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- If spills or leaks of materials occur that are not contained and could discharge to surface waters, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

## **Cost**

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep storage areas clean and well organized, including a current list of all materials onsite.
- Inspect labels on containers for legibility and accuracy.

- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

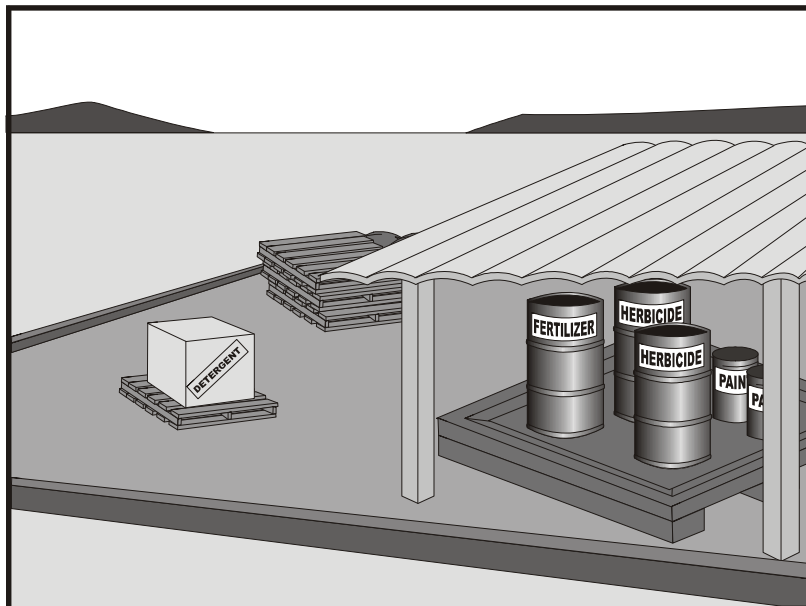
## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

## Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

## Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         | <input checked="" type="checkbox"/> |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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## Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

## Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
  - Do not treat soil that is water-saturated or frozen.
  - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
  - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
  - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
  - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
  - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
  - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
  - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the



application (if different than the contractor). If notice is provided to the contractor or the person commissioning the application, then they are responsible under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) to ensure that: 1) if the concrete slab cannot be poured over the treated soil within 24 hours of application, the treated soil is covered with a waterproof covering (such as polyethylene sheeting), and 2) the treated soil is covered if precipitation is predicted to occur before the concrete slab is scheduled to be poured.

- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydraulic application. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals before predicted rainfall.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted, or contain for proper disposal off site. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Document the location, time, chemicals applied, and applicator's name and qualifications.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Discontinue use of erodible landscape material within 2 days prior to a forecasted rain event and materials should be covered and/or bermed.

- Provide containment for material use areas such as masons' areas or paint mixing/preparation areas to prevent materials/pollutants from entering stormwater.

## Costs

All of the above are low cost measures.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Ensure employees and subcontractors throughout the job are using appropriate practices.

## References

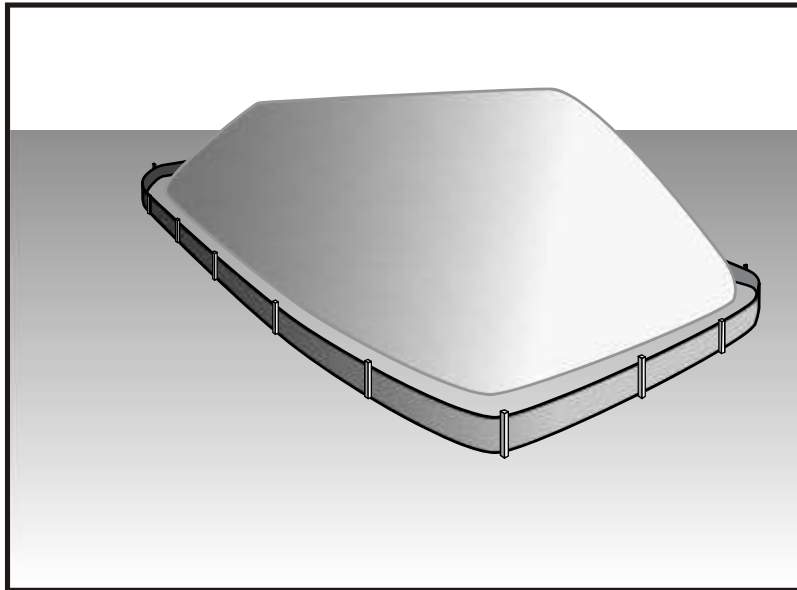
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP-2005-0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006. Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure treated wood.

## Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

## Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

## Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

### Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 | <input checked="" type="checkbox"/> |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                | <input checked="" type="checkbox"/> |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

### Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

### Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         | <input checked="" type="checkbox"/> |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

### Potential Alternatives

None

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- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- After 14 days of inactivity, a stockpile is non-active and requires further protection described below. All stockpiles are required to be protected as non-active stockpiles immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater runoff using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

## ***Protection of Non-Active Stockpiles***

A stockpile is considered non-active if it either is not used for 14 days or if it is scheduled not to be used for 14 days or more. Stockpiles need to be protected immediately if they are not scheduled to be used within 14 days. Non-active stockpiles of the identified materials should be protected as follows:

### *Soil stockpiles*

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

### *Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base*

- Stockpiles should be covered and protected with a temporary perimeter sediment barrier at all times.

### *Stockpiles of “cold mix”*

- Cold mix stockpiles should be placed on and covered with plastic sheeting or comparable material at all times and surrounded by a berm.

### *Stockpiles of fly ash, stucco, hydrated lime*

- Stockpiles of materials that may raise the pH of runoff (i.e., basic materials) should be covered with plastic and surrounded by a berm.

*Stockpiles/Storage of wood (Pressure treated with chromated copper arsenate or ammoniacal copper zinc arsenate)*

- Treated wood should be covered with plastic sheeting or comparable material at all times and surrounded by a berm.

## **Protection of Active Stockpiles**

A stockpile is active when it is being used or is scheduled to be used within 14 days of the previous use. Active stockpiles of the identified materials should be protected as follows:

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

## **Costs**

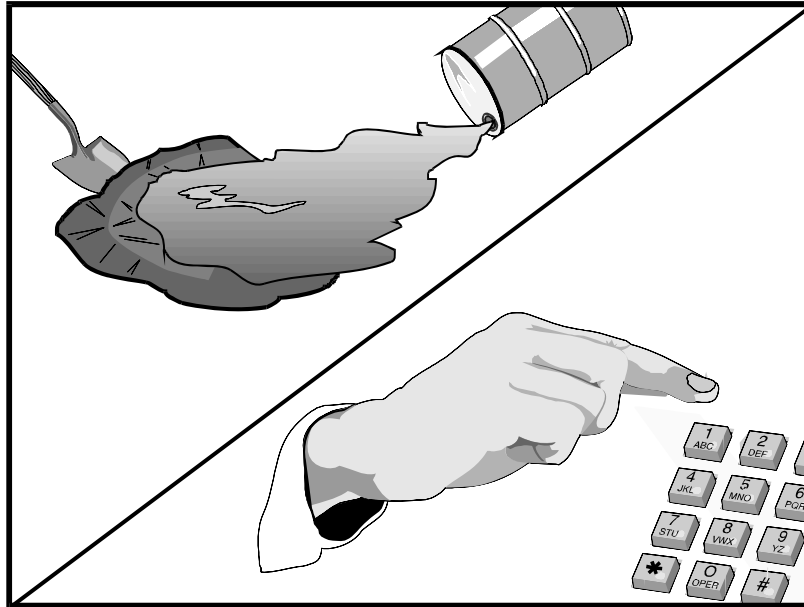
For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

## **Inspection and Maintenance**

- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

## **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.



## Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

## Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         | <input checked="" type="checkbox"/> |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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- Fuels
- Lubricants
- Other petroleum distillates

## **Limitations**

- In some cases it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

## **Implementation**

The following steps will help reduce the stormwater impacts of leaks and spills:

### ***Education***

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

### ***General Measures***

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn’t compromise clean up activities.
- Do not bury or wash spills with water.



- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

## ***Cleanup***

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, 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 either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

## ***Minor Spills***

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

## ***Semi-Significant Spills***

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

## ***Significant/Hazardous Spills***

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

## ***Reporting***

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

## ***Vehicle and Equipment Maintenance***

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Regularly inspect onsite 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.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent 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 pollute 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 the 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***

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

## **Costs**

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

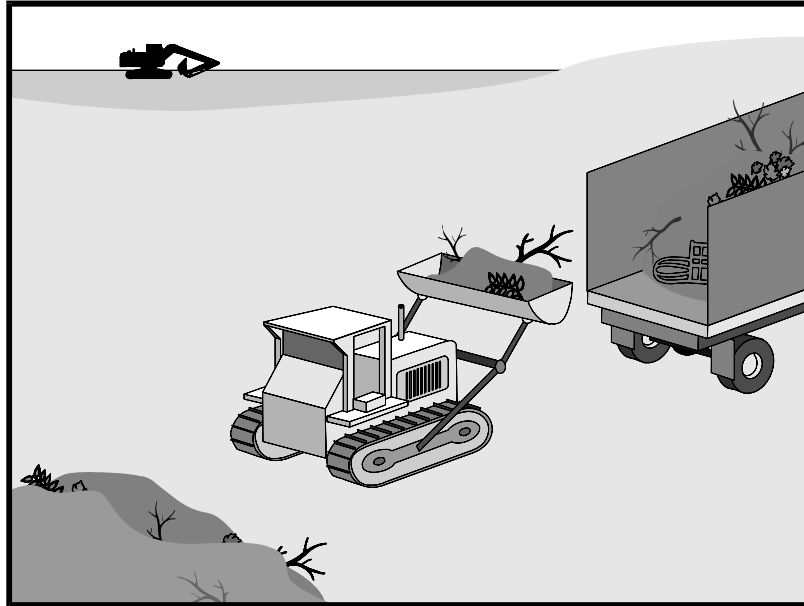
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

## Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

## Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       | <input checked="" type="checkbox"/> |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         | <input checked="" type="checkbox"/> |
| Bacteria       |                                     |
| Oil and Grease | <input checked="" type="checkbox"/> |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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- Highway planting wastes, including vegetative material, plant containers, and packaging materials

## **Limitations**

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

## **Implementation**

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Cover waste containers at the end of each work day and when it is raining.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

## **Education**

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

## ***Collection, Storage, and Disposal***

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runoff should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.



- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

## **Costs**

All of the above are low cost measures.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

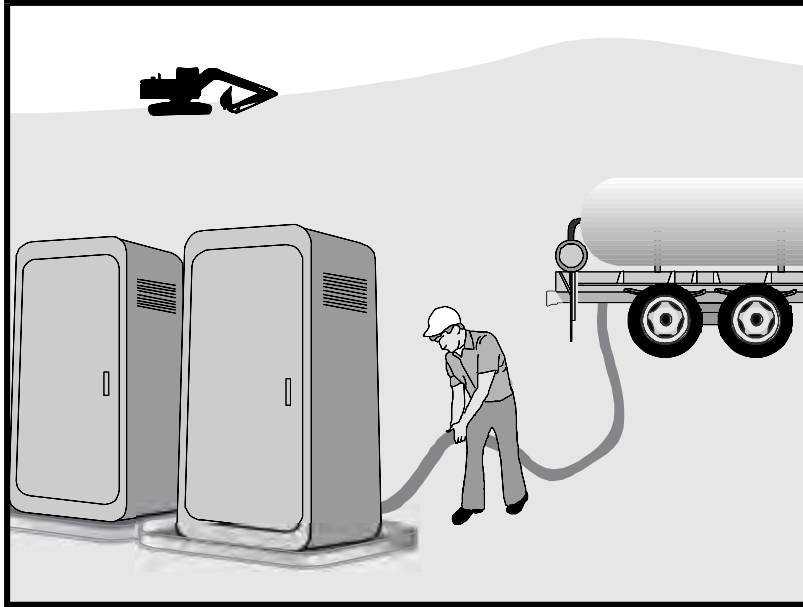
## **References**

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

# Sanitary/Septic Waste Management WM-9



## Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

## Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

## Limitations

None identified.

## Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

## Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

## Categories

|    |                                                  |                                     |
|----|--------------------------------------------------|-------------------------------------|
| EC | Erosion Control                                  |                                     |
| SE | Sediment Control                                 |                                     |
| TC | Tracking Control                                 |                                     |
| WE | Wind Erosion Control                             |                                     |
| NS | Non-Stormwater Management Control                |                                     |
| WM | Waste Management and Materials Pollution Control | <input checked="" type="checkbox"/> |

## Legend:

- ☒ Primary Category
- ☒ Secondary Category

## Targeted Constituents

|                |                                     |
|----------------|-------------------------------------|
| Sediment       |                                     |
| Nutrients      | <input checked="" type="checkbox"/> |
| Trash          | <input checked="" type="checkbox"/> |
| Metals         |                                     |
| Bacteria       | <input checked="" type="checkbox"/> |
| Oil and Grease |                                     |
| Organics       | <input checked="" type="checkbox"/> |

## Potential Alternatives

None

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# **Sanitary/Septic Waste Management WM-9**

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- Temporary sanitary facilities must be equipped with containment to prevent discharge of pollutants to the stormwater drainage system of the receiving water.
- Consider safety as well as environmental implications before placing temporary sanitary facilities.
- Wastewater should not be discharged or buried within the project site.
- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.
- If a spill does occur from a temporary sanitary facility, follow federal, state and local regulations for containment and clean-up.

## ***Education***

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce the use of sanitary facilities (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

## **Costs**

All of the above are low cost measures.

# **Sanitary/Septic Waste Management WM-9**

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## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

## **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

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**APPENDIX H**  
**Construction Site Inspection Form**

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# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project

Woodland, California

## BMP INSPECTION REPORT

|                                                                                                                                                                                                                                  |                                                        |                                                               |                                                                       |                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------|
| Date and Time of Inspection:                                                                                                                                                                                                     |                                                        | Date Report Written:                                          |                                                                       |                                                                |
| Inspection Type:<br>(Circle one)                                                                                                                                                                                                 | Weekly<br><i>Complete Parts<br/>I, II, III and VII</i> | Pre-Storm<br><i>Complete Parts<br/>I, II, III, IV and VII</i> | During Rain Event<br><i>Complete Parts I, II,<br/>III, V, and VII</i> | Post-Storm<br><i>Complete Parts<br/>I, II, III, VI and VII</i> |
| <b>Part I. General Information</b>                                                                                                                                                                                               |                                                        |                                                               |                                                                       |                                                                |
| Site Information                                                                                                                                                                                                                 |                                                        |                                                               |                                                                       |                                                                |
| Construction Site Name:                                                                                                                                                                                                          |                                                        |                                                               |                                                                       |                                                                |
| Construction stage and<br>completed activities:                                                                                                                                                                                  |                                                        |                                                               | Approximate area<br>of site that is exposed:                          |                                                                |
| Photos Taken:<br>(Circle one)                                                                                                                                                                                                    | Yes                                                    | No                                                            | Photo Reference IDs:                                                  |                                                                |
| Weather                                                                                                                                                                                                                          |                                                        |                                                               |                                                                       |                                                                |
| Estimate storm beginning:<br>(date and time)                                                                                                                                                                                     |                                                        | Estimate storm duration:<br>(hours)                           |                                                                       |                                                                |
| Estimate time since last storm:<br>(days or hours)                                                                                                                                                                               |                                                        | Rain gauge reading and location:<br>(in)                      |                                                                       |                                                                |
| Is a "Qualifying Event" predicted or did one occur (i.e., 0.5" rain with 48-hrs or greater between events)? (Y/N)<br>If yes, summarize forecast:                                                                                 |                                                        |                                                               |                                                                       |                                                                |
| Exemption Documentation (explanation required if inspection could not be conducted). Visual inspections are not required outside of business hours or during dangerous weather conditions such as flooding or electrical storms. |                                                        |                                                               |                                                                       |                                                                |
|                                                                                                                                                                                                                                  |                                                        |                                                               |                                                                       |                                                                |
| Inspector Information                                                                                                                                                                                                            |                                                        |                                                               |                                                                       |                                                                |
| Inspector Name:                                                                                                                                                                                                                  |                                                        |                                                               | Inspector Title:                                                      |                                                                |
| Signature:                                                                                                                                                                                                                       |                                                        |                                                               | Date:                                                                 |                                                                |
|                                                                                                                                                                                                                                  |                                                        |                                                               |                                                                       |                                                                |
| <b>Part II. BMP Observations. Describe deficiencies in Part III.</b>                                                                                                                                                             |                                                        |                                                               |                                                                       |                                                                |

# STORM WATER POLLUTION PREVENTION PLAN

## Lillard Ranch Property – Ash Remediation Project

Woodland, California

| Minimum BMPs for Risk Level _____ Sites                                                                                            | Failures or other short comings (yes, no, N/A) | Action Required (yes/no) | Action Implemented (Date) |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------|---------------------------|
| <b>Good Housekeeping for Construction Materials</b>                                                                                |                                                |                          |                           |
| Inventory of products (excluding materials designed to be outdoors)                                                                |                                                |                          |                           |
| Stockpiled construction materials not actively in use are covered and bermed                                                       |                                                |                          |                           |
| All chemicals are stored in watertight containers with appropriate secondary containment, or in a completely enclosed storage shed |                                                |                          |                           |
| Construction materials are minimally exposed to precipitation                                                                      |                                                |                          |                           |
| BMPs preventing the off-site tracking of materials are implemented and properly effective                                          |                                                |                          |                           |
| <b>Good Housekeeping for Waste Management</b>                                                                                      |                                                |                          |                           |
| Wash/rinse water and materials are prevented from being disposed into the storm drain system                                       |                                                |                          |                           |
| Portable toilets are contained to prevent discharges of waste                                                                      |                                                |                          |                           |
| Sanitation facilities are clean and with no apparent for leaks and spills                                                          |                                                |                          |                           |
| Equipment is in place to cover waste disposal containers at the end of business day and during rain events                         |                                                |                          |                           |
| Discharges from waste disposal containers are prevented from discharging to the storm drain system / receiving water               |                                                |                          |                           |
| Stockpiled waste material is securely protected from wind and rain if not actively in use                                          |                                                |                          |                           |
| Procedures are in place for addressing hazardous and non-hazardous spills                                                          |                                                |                          |                           |
| Appropriate spill response personnel are assigned and trained                                                                      |                                                |                          |                           |
| Equipment and materials for cleanup of spills is available onsite                                                                  |                                                |                          |                           |
| Washout areas (e.g., concrete) are contained appropriately to prevent discharge or infiltration into the underlying soil           |                                                |                          |                           |
| <b>Good Housekeeping for Vehicle Storage and Maintenance</b>                                                                       |                                                |                          |                           |
| Measures are in place to prevent oil, grease, or fuel from leaking into the ground, storm drains, or surface waters                |                                                |                          |                           |
| All equipment or vehicles are fueled, maintained, and stored in a designated area with appropriate BMPs                            |                                                |                          |                           |
| Vehicle and equipment leaks are cleaned immediately and disposed of properly                                                       |                                                |                          |                           |

**Part II. BMP Observations Continued. Describe deficiencies in Part III.**

# STORM WATER POLLUTION PREVENTION PLAN

## Lillard Ranch Property – Ash Remediation Project

Woodland, California

| Minimum BMPs for Risk Level ____ Sites                                                                                                                                                       | Adequately designed, implemented and effective (yes, no, N/A) | Action Required (yes/no) | Action Implemented (Date) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------|---------------------------|
| <b>Good Housekeeping for Landscape Materials</b>                                                                                                                                             |                                                               |                          |                           |
| Stockpiled landscape materials such as mulches and topsoil are contained and covered when not actively in use                                                                                |                                                               |                          |                           |
| Erodible landscape material has not been applied 2 days before a forecasted rain event or during an event                                                                                    |                                                               |                          |                           |
| Erodible landscape materials are applied at quantities and rates in accordance with manufacturer recommendations                                                                             |                                                               |                          |                           |
| Bagged erodible landscape materials are stored on pallets and covered                                                                                                                        |                                                               |                          |                           |
| <b>Good Housekeeping for Air Deposition of Site Materials</b>                                                                                                                                |                                                               |                          |                           |
| Good housekeeping measures are implemented onsite to control the air deposition of site materials and from site operations                                                                   |                                                               |                          |                           |
| <b>Non-Storm Water Management</b>                                                                                                                                                            |                                                               |                          |                           |
| Non-Storm Water discharges are properly controlled                                                                                                                                           |                                                               |                          |                           |
| Vehicles are washed in a manner to prevent non-storm Water discharges to surface waters or drainage systems                                                                                  |                                                               |                          |                           |
| Streets are cleaned in a manner to prevent unauthorized non-storm water discharges to surface waters or drainage systems.                                                                    |                                                               |                          |                           |
| <b>Erosion Controls</b>                                                                                                                                                                      |                                                               |                          |                           |
| Wind erosion controls are effectively implemented                                                                                                                                            |                                                               |                          |                           |
| Effective soil cover is provided for disturbed areas inactive (i.e., not scheduled to be disturbed for 14 days) as well as finished slopes, open space, utility backfill, and completed lots |                                                               |                          |                           |
| The use of plastic materials is limited in cases when a more sustainable, environmentally friendly alternative exists.                                                                       |                                                               |                          |                           |
| <b>Sediment Controls</b>                                                                                                                                                                     |                                                               |                          |                           |
| Perimeter controls are established and effective at controlling erosion and sediment discharges from the site                                                                                |                                                               |                          |                           |
| Entrances and exits are stabilized to control erosion and sediment discharges from the site                                                                                                  |                                                               |                          |                           |
| Sediment basins are properly maintained                                                                                                                                                      |                                                               |                          |                           |
| <b>Run-On and Run-Off Controls</b>                                                                                                                                                           |                                                               |                          |                           |
| Run-on to the site is effectively managed and directed away from all disturbed areas.                                                                                                        |                                                               |                          |                           |
| <b>Other</b>                                                                                                                                                                                 |                                                               |                          |                           |

# STORM WATER POLLUTION PREVENTION PLAN

## Lillard Ranch Property – Ash Remediation Project

Woodland, California

|                                                                                                  |  |  |  |
|--------------------------------------------------------------------------------------------------|--|--|--|
| Are the project SWPPP and BMP plan up to date, available on-site and being properly implemented? |  |  |  |
|                                                                                                  |  |  |  |

### Part III. Descriptions of BMP Deficiencies

| Deficiency | Repairs Implemented:<br>Note - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible. |        |
|------------|--------------------------------------------------------------------------------------------------------------------------------|--------|
|            | Start Date                                                                                                                     | Action |
| 1.         |                                                                                                                                |        |
| 2.         |                                                                                                                                |        |
| 3.         |                                                                                                                                |        |
| 4.         |                                                                                                                                |        |

### Part IV. Additional Pre-Storm Observations. Note the presence or absence of floating and suspended materials, sheen, discoloration, turbidity, odors, and source(s) of pollutants(s).

|                                                                                                                           |              |
|---------------------------------------------------------------------------------------------------------------------------|--------------|
|                                                                                                                           | Yes, No, N/A |
| Do storm water storage and containment areas have adequate freeboard? If no, complete Part III.                           |              |
| Are drainage areas free of spills, leaks, or uncontrolled pollutant sources? If no, complete Part VII and describe below. |              |
| Notes:                                                                                                                    |              |
| Are storm water storage and containment areas free of leaks? If no, complete Parts III and/or VII and describe below.     |              |
| Notes:                                                                                                                    |              |

### Part V. Additional During Storm Observations. If BMPs cannot be inspected during inclement weather, list the results of visual inspections at all relevant outfalls, discharge points, and downstream locations. Note odors or visible sheen on the surface of discharges. Complete Part VII (Corrective Actions) as needed.

Outfall, Discharge Point, or Other Downstream Location

# STORM WATER POLLUTION PREVENTION PLAN

# Lillard Ranch Property – Ash Remediation Project

Woodland, California

[illegible]

# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project  
Woodland, California

**Part VI. Additional Post-Storm Observations.** Visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event, and observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Complete Part VII (Corrective Actions) as needed.

| Discharge Location, Storage or Containment Area | Visual Observation |
|-------------------------------------------------|--------------------|
|                                                 |                    |
|                                                 |                    |
|                                                 |                    |
|                                                 |                    |
|                                                 |                    |

**Part VII. Additional Corrective Actions Required.** Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Note if SWPPP change is required.

| Required Actions | Implementation Date |
|------------------|---------------------|
|                  |                     |
|                  |                     |
|                  |                     |

**APPENDIX I**  
**Training Log**



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# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project  
Woodland, California

## TRAINED CONTRACTOR PERSONNEL LOG Storm Water Management Training Log and Documentation

Project Name: Lillard Ranch Property – Ash Remediation Project

WDID #: \_\_\_\_\_

Storm Water Management Topic: (check as appropriate)

☐ Erosion Control

☐ Sediment Control

☐ Wind Erosion Control

☐ Tracking Control

☐ Non-Storm Water Management

☐ Waste Management

☐ Storm Water Sampling

☐ Materials Pollution Control

Specific Training Objective: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_

Telephone: \_\_\_\_\_

Course Length (hours): \_\_\_\_\_

### Attendee Roster (Attach additional forms if necessary)

| Name | Company | Phone |
|------|---------|-------|
|      |         |       |
|      |         |       |
|      |         |       |
|      |         |       |
|      |         |       |
|      |         |       |

As needed, add proof of external training (e.g., course completion certificates, credentials for QSP, QSD).

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**APPENDIX J**  
**Responsible Parties**

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# STORM WATER POLLUTION PREVENTION PLAN

Lillard Ranch Property – Ash Remediation Project  
Woodland, California

## RESPONSIBLE PARTIES AND APPROVED SIGNATORIES

Project Name: Lillard Ranch Property – Ash Remediation Project

WDID #: \_\_\_\_\_

| Name of Personnel | Project Role | Company | Signature | Date |
|-------------------|--------------|---------|-----------|------|
|                   |              |         |           |      |
|                   |              |         |           |      |
|                   |              |         |           |      |
|                   |              |         |           |      |
|                   |              |         |           |      |

\_\_\_\_\_  
LRP's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
LRP Name and Title

\_\_\_\_\_  
Telephone Number

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**APPENDIX K**  
**Contractors and Subcontractors**

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# STORM WATER POLLUTION PREVENTION PLAN

# Lillard Ranch Property – Ash Remediation Project Woodland, California

## LIST OF CONTRACTORS AND SUB-CONTRACTORS

[illegible]

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**APPENDIX L**  
**CSMP and Weather Reports**

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**APPENDIX L**  
**CSMP Attachment 1**  
**Weather Reports**

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# STORM WATER POLLUTION PREVENTION PLAN

# Lillard Ranch Property – Ash Remediation Project

# Woodland, California

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**APPENDIX L**  
**CSMP Attachment 2**  
**Monitoring Records**

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**APPENDIX L**  
**CSMP Attachment 3**  
**Field Meter Operations Manual/Calibration Instructions, and**  
**Calibration Dates**

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**APPENDIX L**  
**CSMP Attachment 4**  
**Supplemental Information**

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## **APPENDIX M**

### **Glossary and Acronyms**

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## **APPENDIX 5: Glossary**

### **Active Areas of Construction**

All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

### **Active Treatment System (ATS)**

A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

### **Acute Toxicity Test**

A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

### **Air Deposition**

Airborne particulates from construction activities.

### **Approved Signatory**

A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;
5. For a public university: an authorized university official;
6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or
7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

### **Beneficial Uses**

As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

### **Best Available Technology Economically Achievable (BAT)**

As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

### **Best Conventional Pollutant Control Technology (BCT)**

As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

### **Best Professional Judgment (BPJ)**

The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

### **Best Management Practices (BMPs)**

BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

**Chain of Custody (COC)**

Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

**Coagulation**

The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

**Common Plan of Development**

Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

**Daily Average Discharge**

The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

**Debris**

Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

**Direct Discharge**

A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

**Discharger**

The Legally Responsible Person (see definition) or entity subject to this General Permit.

**Dose Rate (for ATS)**

In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

**Drainage Area**

The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

**Effluent**

Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

**Effluent Limitation**

Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

**Erosion**

The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

**Erosion Control BMPs**

Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

**Field Measurements**

Testing procedures performed in the field with portable field-testing kits or meters.

**Final Stabilization**

All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

**First Order Stream**

Stream with no tributaries.

**Flocculants**

Substances that interact with suspended particles and bind them together to form flocs.

**Good Housekeeping BMPs**

BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

**Grading Phase (part of the Grading and Land Development Phase)**

Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

**Hydromodification**

Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

**Identified Organisms**

Organisms within a sub-sample that is specifically identified and counted.

**Inactive Areas of Construction**

Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

**Index Period**

The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year, and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

**K Factor**

The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

**Legally Responsible Person**

The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.
2. In addition to the above, the following persons or entities may also serve as an LRP:
  - a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;
  - b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);
  - c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or
  - d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

### **Likely Precipitation Event**

Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

### **Maximum Allowable Threshold Concentration (MATC)**

The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity



testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

### **Natural Channel Evolution**

The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass through the suite of evolution stages, they will rest in a new state of equilibrium.

### **Non-Storm Water Discharges**

Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

### **Non-Visible Pollutants**

Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen through observation (ex: chlorine). Such pollutants being discharged are not authorized.

### **Numeric Action Level (NAL)**

Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

### **Original Sample Material**

The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

### **pH**

Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

### **Post-Construction BMPs**

Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

**Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)**

Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

**Project**

**Qualified SWPPP Developer**

Individual who is authorized to develop and revise SWPPPs.

**Qualified SWPPP Practitioner**

Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

**Qualifying Rain Event**

Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

**R Factor**

Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

**Rain Event Action Plan (REAP)**

Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

**Remaining Sub sampled Material**

The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

**Routine Maintenance**

Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

**Runoff Control BMPs**

Measures used to divert runoff from offsite and runoff within the site.

**Run-on**

Discharges that originate offsite and flow onto the property of a separate project site.

**Revised Universal Soil Loss Equation (RUSLE)**

Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

**Sampling and Analysis Plan**

Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

**Sediment**

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

**Sedimentation**

Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

**Sediment Control BMPs**

Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

**Settleable Solids (SS)**

Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

**Sheet Flow**

Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

**Site****Soil Amendment**

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

**Streets and Utilities Phase**

Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

**Structural Controls**

Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

**Suspended Sediment Concentration (SSC)**

The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

**Total Suspended Solids (TSS)**

The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

**Toxicity**

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

**Turbidity**

The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

**Vertical Construction Phase**

The Build out of structures from foundations to roofing, including rough landscaping.

**Waters of the United States**

Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.<sup>1</sup>

**Water Quality Objectives (WQO)**

Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

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<sup>1</sup> The application of the definition of “waters of the United States” may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

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## APPENDIX 6: Acronym List

|        |                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------|
| ASBS   | Areas of Special Biological Significance                                                            |
| ASTM   | American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils |
| ATS    | Active Treatment System                                                                             |
| BASMAA | Bay Area Storm water Management Agencies Association                                                |
| BAT    | Best Available Technology Economically Achievable                                                   |
| BCT    | Best Conventional Pollutant Control Technology                                                      |
| BMP    | Best Management Practices                                                                           |
| BOD    | Biochemical Oxygen Demand                                                                           |
| BPJ    | Best Professional Judgment                                                                          |
| CAFO   | Confined Animal Feeding Operation                                                                   |
| CCR    | California Code of Regulations                                                                      |
| CEQA   | California Environmental Quality Act                                                                |
| CFR    | Code of Federal Regulations                                                                         |
| CGP    | NPDES General Permit for Storm Water Discharges Associated with Construction Activities             |
| CIWQS  | California Integrated Water Quality System                                                          |
| CKD    | Cement Kiln Dust                                                                                    |
| COC    | Chain of Custody                                                                                    |
| CPESC  | Certified Professional in Erosion and Sediment Control                                              |
| CPSWQ  | Certified Professional in Storm Water Quality                                                       |
| CSMP   | Construction Site Monitoring Program                                                                |
| CTB    | Cement Treated Base                                                                                 |
| CTR    | California Toxics Rule                                                                              |
| CWA    | Clean Water Act                                                                                     |
| CWC    | California Water Code                                                                               |
| CWP    | Center for Watershed Protection                                                                     |
| DADMAC | Diallyldimethyl-ammonium chloride                                                                   |
| DDNR   | Delaware Department of Natural Resources                                                            |
| DFG    | Department of Fish and Game                                                                         |
| DHS    | Department of Health Services                                                                       |
| DWQ    | Division of Water Quality                                                                           |
| EC     | Electrical Conductivity                                                                             |
| ELAP   | Environmental Laboratory Accreditation Program                                                      |
| EPA    | Environmental Protection Agency                                                                     |
| ESA    | Environmentally Sensitive Area                                                                      |
| ESC    | Erosion and Sediment Control                                                                        |
| HSPF   | Hydrologic Simulation Program Fortran                                                               |
| JTU    | Jackson Turbidity Units                                                                             |
| LID    | Low Impact Development                                                                              |
| LOEC   | Lowest Observed Effect Concentration                                                                |
| LRP    | Legally Responsible Person                                                                          |
| LUP    | Linear Underground/Overhead Projects                                                                |

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| MATC           | Maximum Allowable Threshold Concentration                        |
| MDL            | Method Detection Limits                                          |
| MRR            | Monitoring and Reporting Requirements                            |
| MS4            | Municipal Separate Storm Sewer System                            |
| MUSLE          | Modified Universal Soil Loss Equation                            |
| NAL            | Numeric Action Level                                             |
| NEL            | Numeric Effluent Limitation                                      |
| NICET          | National Institute for Certification in Engineering Technologies |
| NOAA           | National Oceanic and Atmospheric Administration                  |
| NOEC           | No Observed Effect Concentration                                 |
| NOI            | Notice of Intent                                                 |
| NOT            | Notice of Termination                                            |
| NPDES          | National Pollutant Discharge Elimination System                  |
| NRCS           | Natural Resources Conservation Service                           |
| NTR            | National Toxics Rule                                             |
| NTU            | Nephelometric Turbidity Units                                    |
| O&M            | Operation and Maintenance                                        |
| PAC            | Polyaluminum chloride                                            |
| PAM            | Polyacrylamide                                                   |
| PASS           | Polyaluminum chloride Silica/sulfate                             |
| POC            | Pollutants of Concern                                            |
| PoP            | Probability of Precipitation                                     |
| POTW           | Publicly Owned Treatment Works                                   |
| PRDs           | Permit Registration Documents                                    |
| PWS            | Planning Watershed                                               |
| QAMP           | Quality Assurance Management Plan                                |
| QA/QC          | Quality Assurance/Quality Control                                |
| REAP           | Rain Event Action Plan                                           |
| Regional Board | Regional Water Quality Control Board                             |
| ROWD           | Report of Waste Discharge                                        |
| RUSLE          | Revised Universal Soil Loss Equation                             |
| RW             | Receiving Water                                                  |
| SMARTS         | Storm water Multi Application Reporting and Tracking             |
| System         |                                                                  |
| SS             | Settleable Solids                                                |
| SSC            | Suspended Sediment Concentration                                 |
| SUSMP          | Standard Urban Storm Water Mitigation Plan                       |
| SW             | Storm Water                                                      |
| SWARM          | Storm Water Annual Report Module                                 |
| SWAMP          | Surface Water Ambient Monitoring Program                         |
| SWMM           | Storm Water Management Model                                     |
| SWMP           | Storm Water Management Program                                   |
| SWPPP          | Storm Water Pollution Prevention Plan                            |
| TC             | Treatment Control                                                |
| TDS            | Total Dissolved Solids                                           |



|        |                                               |
|--------|-----------------------------------------------|
| TMDL   | Total Maximum Daily Load                      |
| TSS    | Total Suspended Solids                        |
| USACOE | U.S. Army Corps of Engineers                  |
| USC    | United States Code                            |
| USEPA  | United States Environmental Protection Agency |
| USGS   | United States Geological Survey               |
| WDID   | Waste Discharge Identification Number         |
| WDR    | Waste Discharge Requirements                  |
| WLA    | Waste Load Allocation                         |
| WET    | Whole Effluent Toxicity                       |
| WRCC   | Western Regional Climate Center               |
| WQBEL  | Water Quality Based Effluent Limitation       |
| WQO    | Water Quality Objective                       |
| WQS    | Water Quality Standard                        |

**APPENDIX C**  
**SPECIFICATIONS AND GRADING PLANS**



REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
ADDENDUM #2

LILLARD RANCH PROPERTY - ASH REMEDIATION PROJECT  
24998 COUNTY ROAD 102, DAVIS, YOLO COUNTY, CALIFORNIA

PROJECT OWNER / DEVELOPER:

WOODLAND BIOMASS POWER LTD.  
1786 E. KENTUCKY AVE  
WOODLAND, CA 95776

PROJECT PARCEL NUMBER:

042-120-010

PROJECT DESCRIPTION:

REMEDIAL EXCAVATION AND OFFSITE TRANSPORTATION OF CALIFORNIA HAZARDOUS ASH AND ONSITE MANAGEMENT OF NONHAZARDOUS ASH LOCATED ON A PROPERTY IDENTIFIED AS "THE LILLARD RANCH PROPERTY". ASH CONTAINING METAL (COPPER AND LEAD) CONCENTRATIONS ABOVE THE REGULATORY LEVELS WILL BE TRANSPORTED TO AN OFFSITE DISPOSAL FACILITY. ASH CONTAINING DIOXINS AND FURANS CONCENTRATIONS ABOVE THE AGRICULTURAL CRITERIA WILL BE BLENDED WITH ON-SITE NATIVE SOIL AND REUSED ONSITE. FURTHERMORE, ENTIRE FOOTPRINT OF THE AREA CONTAINING ASH WILL BE PLOWED/DISKED TO LOOSEN UP THE SOIL TO REMOVE METALLIC DEBRIS SUCH AS NAILS AND HINGES USING A MAGNET. EXCAVATION AREAS WILL BE BACKFILLED TO PRECONSTRUCTION GRADE ELEVATION. IT IS ANTICIPATED THAT APPROXIMATELY 37.5 ACRES OF LAND WILL BE SUBJECT TO GRADING AND RESTORATION ACTIVITIES.

THE REMEDIATION ACTIVITIES WILL BE OVERSEEN BY THE YOLO COUNTY DISTRICT ATTORNEY'S OFFICE AND CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF TOXIC SUBSTANCES.

PROJECT DURATION:

APRIL 10, 2017 THROUGH MAY 19, 2017

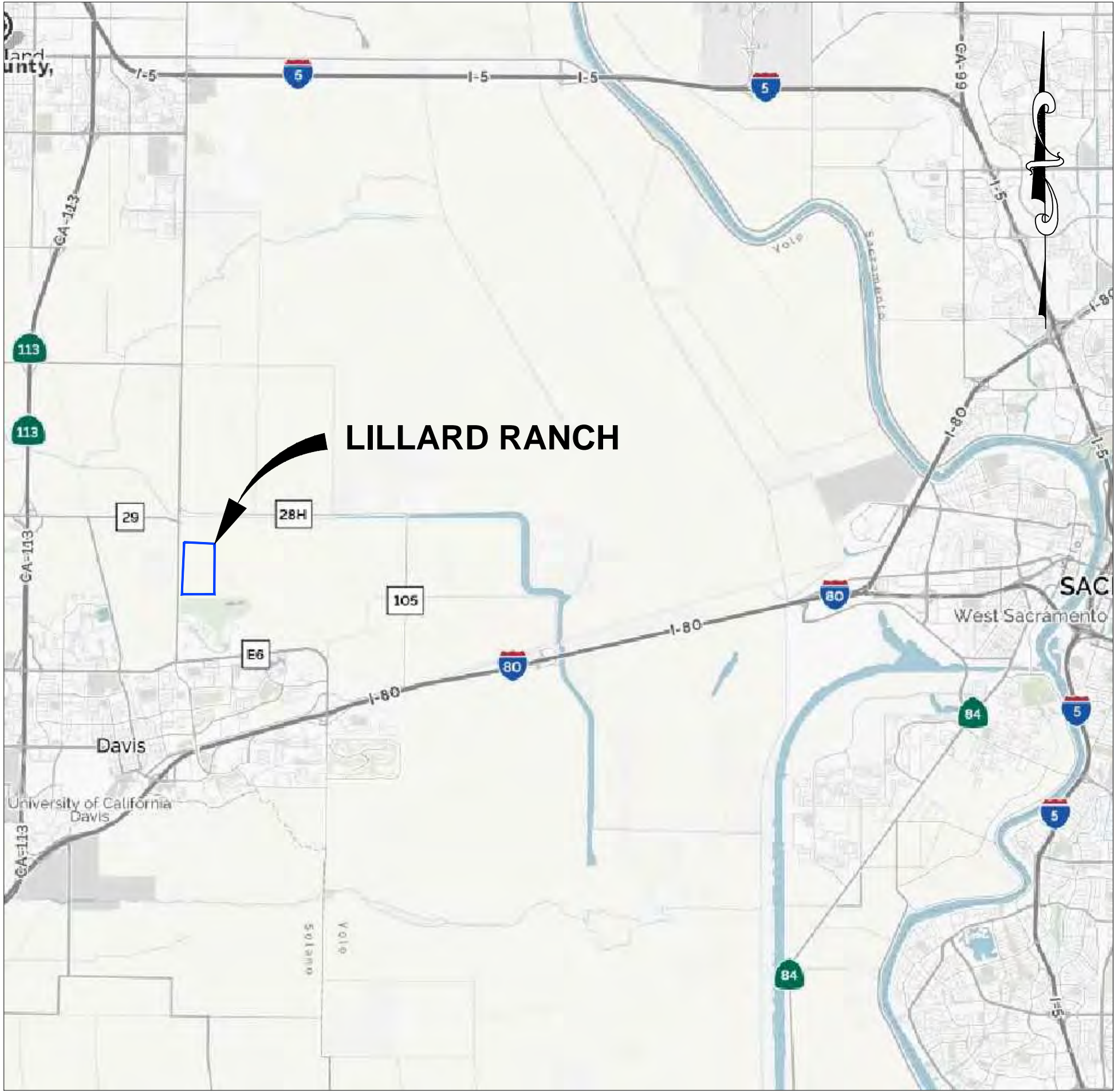
EARTHWORK QUANTITIES:

TOTAL CUT (CUBIC YARDS): 6,786.00 C.Y.  
TOTAL FILL (CUBIC YARDS): 6,786.00 C.Y.  
TOTAL IMPORT (CUBIC YARDS): 0\* C.Y.  
TOTAL EXPORT (CUBIC YARDS): 3,342.00 C.Y.

\*ONSITE STOCKPILED MATERIAL WILL BE USED TO BACKFILL EXCAVATED AREAS

ENGINEER OF RECORD:

TRC SOLUTIONS INC.  
9685 RESEARCH DRIVE  
IRVINE, CA 92618  
(949)341-7447  
PROJECT ENGINEER - ERCAN CANDAN, PE



LOCATION MAP

SCALE: 1" = 6,000'

BENCH MARK:

THE ELEVATIONS SHOWN HEREON ARE BASED UPON STATIC GPS OBSERVATION, HOLDING THE LEICA S.N.N.A. C.O.R.S. "PLSB"; ELEVATION = 929.56 FEET (NAVD 88)

BASES OF BEARINGS:

THE COORDINATES SHOWN HEREON ARE BASED UPON THE CALCULATED LINE BETWEEN THE TWO FOUND NGS POINTS, DESIGNATED "RFW1" AND "COY DUMP" PER PARCEL MAP 5063 RECORDED IN BOOK 2015 PAGES 33-34 OF MISCELLANEOUS RECORDS, IN THE OFFICE OF THE COUNTY RECORDER OF YOLO COUNTY, THE COORDINATES OF THE NGS POINTS ARE AS FOLLOWS:

NGS POINT "RFW1"  
N: 1975368.34  
E: 6632721.09  
(GROUND VALUES)  
CALIFORNIA STATE PLANE, ZONE II  
(NAD83)

NGS POINT "COY DUMP"  
N: 1977246.47  
E: 6649649.01  
(GROUND VALUES)  
CALIFORNIA STATE PLANE, ZONE II  
(NAD83)



VICINITY MAP

SCALE: 1" = 1,000'

SHEET INDEX:

|          |                                                             |
|----------|-------------------------------------------------------------|
| SHEET 1  | TITLE SHEET                                                 |
| SHEET 2  | GRADING NOTES                                               |
| SHEET 3  | SITE PLAN AND TEMPORARY FACILITIES                          |
| SHEET 4  | GRADING PLAN - DECISION UNIT GRADING                        |
| SHEET 5  | GRADING PLAN - DECISION UNIT GRADING                        |
| SHEET 6  | EROSION CONTROL PLAN                                        |
| SHEET 7  | TRAFFIC CONTROL PLAN                                        |
| SHEET 8  | GRADING PLAN - DECISION UNIT GRADING (DIOXIN FURAN REMOVAL) |
| SHEET 9  | GRADING PLAN - DECISION UNIT GRADING (DIOXIN FURAN REMOVAL) |
| SHEET 10 | GRADING PLAN - METALLIC DEBRIS REMOVAL                      |
| SHEET 11 | GRADING PLAN - METALLIC DEBRIS REMOVAL                      |



ATTENTION:

ALL UNDERGROUND UTILITIES AND SUBSTRUCTURES SHOWN HEREON WERE OBTAINED FROM THE BEST AVAILABLE SOURCES AND ARE PRESUMED TO BE ACCURATE AND COMPLETE. BUT SINCE THE INFORMATION WAS OBTAINED FROM OTHERS, THE OFFICE OF MNS ENGINEERS, INC. CANNOT GUARANTEE SAID INFORMATION AS BEING ACCURATE AND COMPLETE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO VERIFY, LOCATE, AND PROTECT ALL UTILITIES AND SUBSTRUCTURES SHOWN OR NOT SHOWN.  
CALL UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA  
TOLL FREE AT 1-800-422-4133 TWO WORKING DAYS BEFORE YOU DIG

UNAUTHORIZED CHANGES & USES

CAUTION: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



9685 RESEARCH DRIVE  
IRVINE, CA 92618  
Phone: 949.341.7447  
www.trcsolutions.com

|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
|                           | for Agency / Utility |
| PRINT NAME:               |                      |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

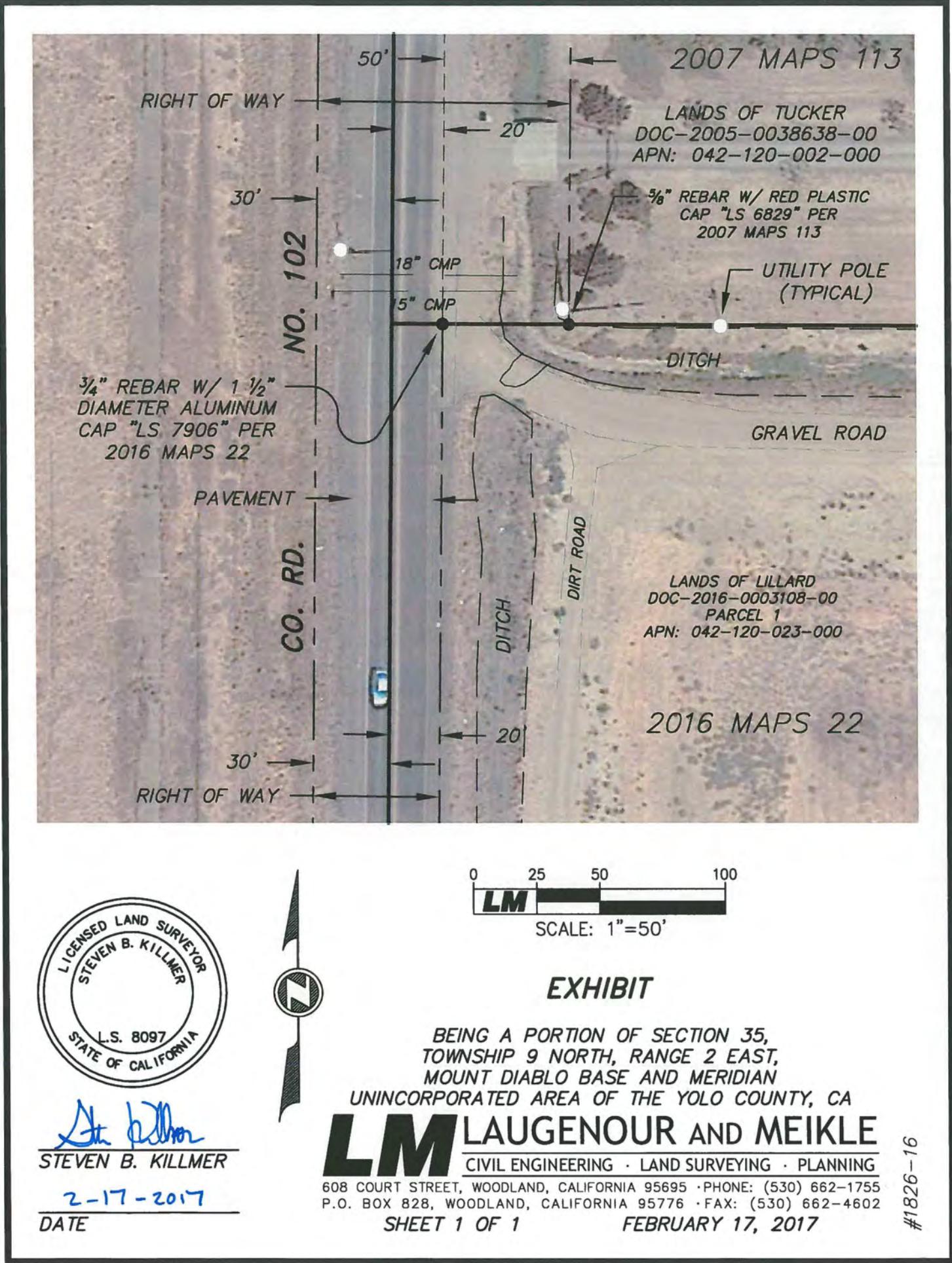
TITLE PAGE

SHEET 1  
OF  
11 SHEETS









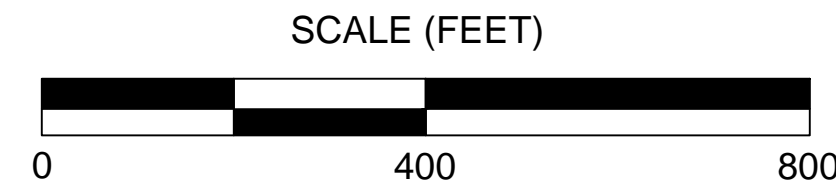
NOTES:

- 1 ASH BOUNDARY, REFER TO SHEET 4 FOR SPECIFIC AREAS OF EXCAVATION REFERRED TO IT AS "DECISION UNITS".
- 2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 SITE ENTRANCE / EXIT LOCATION FOR ALL CONSTRUCTION PERSONNEL, VISITORS, AND EQUIPMENT. REFER TO SHEET 6 FOR REQUIRED CONSTRUCTION SITE ENTRANCE IMPROVEMENTS AND 7 FOR TRAFFIC CONTROL PLAN.
- 5 DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 7 ACCESS ROADS TO PERSONNEL PARKING AND EQUIPMENT STORAGE AREA.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE AGRICULTURAL CRITERIA SPREADING/BLENDING AREA.

2 3 5 6 8 CLEARING AND GRUBBING OF VEGETATION MAY BE REQUIRED TO MAKE THESE LOCATIONS FUNCTIONAL FOR THEIR RESPECTIVE INTENDENT USE.

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- ONSITE STAFF ACCESS ROAD



ATTENTION:  
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CALL UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA TOLL FREE AT 1-800-422-4133 TWO WORKING DAYS BEFORE YOU DIG

UNAUTHORIZED CHANGES & USES  
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|     |           |    |                                                                         |
|-----|-----------|----|-------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN           |
|     |           |    | CONTAINING ASH SPREADING LOCATION                                       |
| REV | DATE      | BY | DESCRIPTION                                                             |



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|                           |      |
|---------------------------|------|
| PROJECT ENGINEER          |      |
| ERCAN CANDAN, P.E. C72067 | DATE |
| PROJECT MANAGER           |      |
|                           | DATE |
| PRINT NAME:               | DATE |

|                      |      |
|----------------------|------|
| REVIEWED BY:         |      |
| for Agency / Utility | DATE |
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| for Agency / Utility | DATE |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

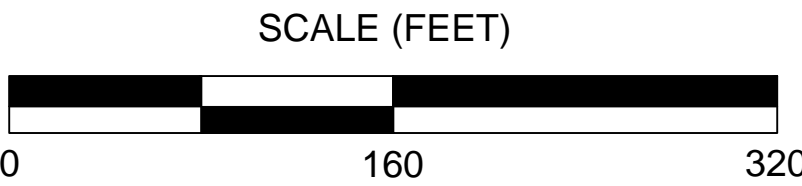
SITE PLAN AND TEMPORARY FACILITIES

SHEET 3  
OF  
11 SHEETS





MATCHLINE - SEE SHEET 5



NOTES:

1. PREPARE EXCAVATION, STOCKPILE AND HAUL ROADS BY TRIMMING, CLEARING, OR GRUBBING VEGETATION, IF PRESENT.
2. INSTALL A 10-MIL PLASTIC BARRIER WITHIN THE TEMPORARY STOCKPILE STAGING AREA FOOTPRINT. EXCAVATED ASH MATERIAL SHALL BE PLACED ON THE PLASTIC. UPON COMPLETION OF ALL EXCAVATION ACTIVITIES AND REMOVAL OF ALL ASH MATERIAL FROM THE STOCKPILE LOCATION, REMOVE AND DISPOSE THE PLASTIC AT AN APPROPRIATE OFFSITE DISPOSAL FACILITY.
3. ESTIMATED EXCAVATION DEPTH AND ASH VOLUME FOR EACH DECISION UNIT IS PROVIDED IN BELOW TABLE.
4. EXCAVATE ASH FROM DECISION UNITS 5C, 11C, 6D, 13G, 8H, 12J, 10L, 10M, 13M, 16P, 17T, 10V, 9W, 10Y, 20Z, 21Z, 24Z, 16BB, 18BB, 15DD, 14FF, 9GG, 28HH, 118, AND 27PP PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
5. UPON ACCUMULATION OF SUFFICIENT VOLUME OF ASH IN THE STOCKPILE STAGING AREA, LOAD END DUMP TRUCKS AND TRANSPORT TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
6. EXCAVATE ASH FROM DECISION UNITS 6D, 8H, 13G, 16P, 9W, 20Z, 18BB, 14FF, AND 28HH AND STOCKPILE SEPARATELY. COORDINATE WITH THE DISPOSAL FACILITY FOR THE TRANSPORT AND ACCEPTANCE OF THIS MATERIAL UNDER WASTE PROFILE NUMBER CA611751 AS MATERIAL FROM THESE DECISION UNITS WILL REQUIRE TREATMENT/STABILIZATION AT THE LANDFILL.
7. PERFORM ALL EXCAVATION WORK IN A MANNER TO MINIMIZE THE POTENTIAL FOR SPREADING ASH FROM SUBJECT DECISION UNITS TO OTHER AREAS OF THE SITE. EQUIPMENT EXCAVATING AND TRANSPORTING ASH TO THE STOCKPILE AREA SHALL BE LIMITED TO OPERATING ON THE AREA OF ASH, TO AVOID TRACKING ASH TO AREAS OF NON-ASH AT THE SITE.
8. ROUTE END DUMP TRUCKS TRANSPORTING ASH FROM THE NORTHERN ACCESS POINT AND ALONG THE TRAVEL PATH INDICATED ON SHEET 3. IMPROVEMENTS TO ACCESS ROUTE MAY BE REQUIRED.
9. LOAD END DUMP TRUCKS, TARP AND WEIGH TRUCKS ONSITE TO ENSURE TRUCKS MEET THE LEGAL LOAD LIMIT PRIOR TO LEAVING SITE FOR THE DISPOSAL FACILITY IN KETTLEMAN CITY.
10. UPON COMPLETION OF EXCAVATION OF ASH MATERIAL FROM DESIGNATED DECISION UNITS AND PRIOR TO BACKFILL, ENGINEER WILL COLLECT A CONFIRMATION SAMPLE FOR ANALYSIS. CONTRACTOR WILL PROVIDE UP TO 4 DAYS FOR SAMPLE ANALYSIS. BASED ON THE RESULTS OF THE LABORATORY ANALYSIS, AND AT DIRECTION OF THE ENGINEER, CONTRACTOR WILL FURTHER EXCAVATE OR WILL BACKFILL THE EXCAVATION.
11. PRIOR TO OBTAINING BACKFILL MATERIAL FROM THE ONSITE STOCKPILE, CONTRACTOR MUST ENSURE THAT THE DECISION UNIT I18 IS REMOVED, CONFIRMATION SAMPLE IS COLLECTED AND THE ENGINEER HAS PROVIDED CLEARANCE TO BEGIN REMOVING SOIL FROM THE HOSTETLER STOCKPILE FOR BACKFILL PURPOSES.
12. BACKFILL EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
13. PLACE BACKFILL MATERIAL IN SIX INCH LAYERS, AND COMPACT TO 90 PERCENT MINIMUM RELATIVE COMPACTION IN UNIFORM HORIZONTAL LAYERS.
14. UPON COMPLETION OF BACKFILLING ACTIVITIES, COMPACT ALL LOOSE SURFACES ON THE HOSTETLER STOCKPILE, SPREAD HYDROSEED TO PREVENT FUTURE EROSION AND SEDIMENT TRANSPORT FROM THE STOCKPILE AREA.
15. SPREAD HYDROSEED WHERE VEGETATION EXISTED PRIOR TO SITE CONSTRUCTION ACTIVITIES TO RETURN SITE TO PRE-GRADING CONDITIONS. REFER TO YOLO COUNTY STANDARDS SECTION 11-4.6.

- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE AGRICULTURAL CRITERIA SPREADING/BLENDING AREA.

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- 50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY

| DECISION UNIT | MAXIMUM ASH THICKNESS (INCHES) | ESTIMATED REMOVAL VOLUME (CUBIC YARDS) | CURRENT GROUND SURFACE ELEVATION (FEET) | PROPOSED GROUND SURFACE ELEVATION (FEET) |
|---------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 5C            | 12                             | 93                                     | 33.25                                   | 33.25                                    |
| 11C           | 12                             | 93                                     | 32.27                                   | 32.27                                    |
| 6D            | 12                             | 93                                     | 33.31                                   | 33.31                                    |
| 13G           | 18                             | 139                                    | 32.92                                   | 32.92                                    |
| 8H            | 24                             | 185                                    | 33.50                                   | 33.50                                    |
| 12J           | 18                             | 139                                    | 32.33                                   | 32.33                                    |
| 10L           | 18                             | 139                                    | 33.74                                   | 33.74                                    |
| 10M           | 24                             | 185                                    | 33.33                                   | 33.33                                    |
| 13M           | 12                             | 93                                     | 32.57                                   | 32.57                                    |
| 16P           | 18                             | 139                                    | 32.93                                   | 32.93                                    |
| 17T           | 12                             | 93                                     | 32.53                                   | 32.53                                    |
| 10V           | 12                             | 93                                     | 32.59                                   | 32.59                                    |
| 9W            | 12                             | 93                                     | 32.88                                   | 32.88                                    |
| 10Y           | 12                             | 93                                     | 32.63                                   | 32.63                                    |
| 20Z           | 12                             | 93                                     | 31.90                                   | 31.90                                    |
| 21Z           | 12                             | 93                                     | 32.08                                   | 32.08                                    |
| 24Z           | 12                             | 93                                     | 32.06                                   | 32.06                                    |
| 16BB          | 12                             | 93                                     | 32.54                                   | 32.54                                    |
| 18BB          | 18                             | 139                                    | 33.30                                   | 33.30                                    |
| 15DD          | 12                             | 93                                     | 32.73                                   | 32.73                                    |
| 14FF          | 12                             | 93                                     | 32.80                                   | 32.80                                    |
| 9GG           | 12                             | 93                                     | 33.09                                   | 33.09                                    |
| 28HH          | 18                             | 139                                    | 33.29                                   | 33.29                                    |
| I18           | 12                             | 93                                     | 33.28                                   | 33.28                                    |
| 27PP          | 12                             | 93                                     | 32.75                                   | 32.75                                    |
| TOTAL         |                                | 2,785                                  | CY (IN-PLACE)                           |                                          |
|               |                                | 3,342                                  | CY (WITH 20% EXPANSION)                 |                                          |
|               |                                | 5,013                                  | TONS (AT 1 CY=1.5 TONS)                 |                                          |



ATTENTION:  
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| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                                                       |                                              |
|-------------------------------------------------------|----------------------------------------------|
| PROJECT ENGINEER<br>ERCAN CANDAN, P.E. C72067<br>DATE | REVIEWED BY:<br>for Agency / Utility<br>DATE |
| PROJECT MANAGER<br>DATE                               | REVIEWED BY:<br>for Agency / Utility<br>DATE |
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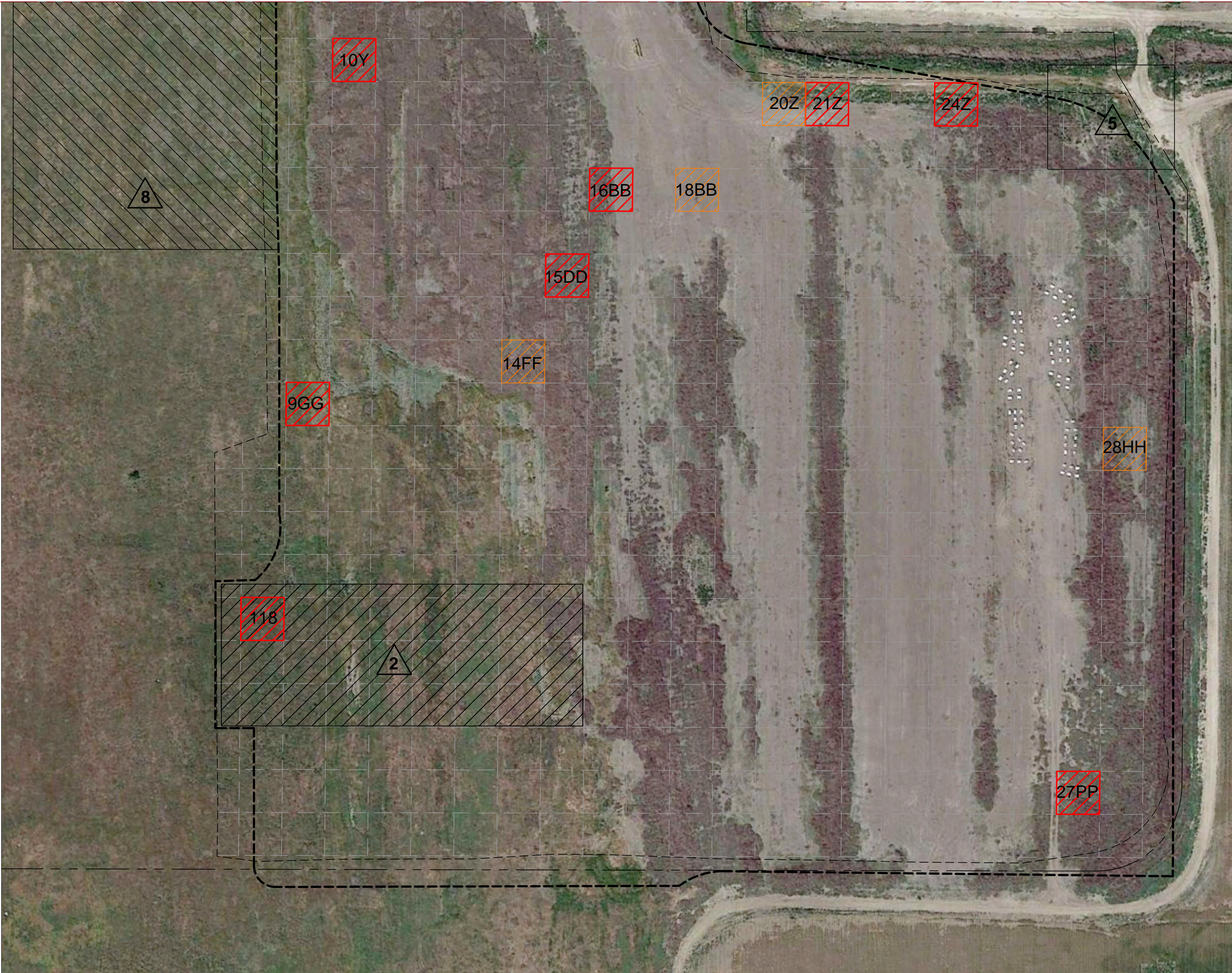
REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

GRADING PLAN-DECISION UNIT GRADING

SHEET 4  
OF  
11 SHEETS

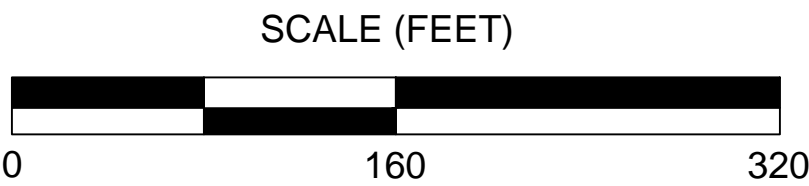


MATCHLINE - SEE SHEET 4



NOTES:

1. PREPARE EXCAVATION, STOCKPILE AND HAUL ROADS BY TRIMMING, CLEARING, OR GRUBBING VEGETATION, IF PRESENT.
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NOTES CONTINUED:

6. EXCAVATE ASH FROM DECISION UNITS 6D, 8H, 13G, 16P, 9W, 20Z, 18BB, 14FF, AND 28HH AND STOCKPILE SEPARATELY. COORDINATE WITH THE DISPOSAL FACILITY FOR THE TRANSPORT AND ACCEPTANCE OF THIS MATERIAL UNDER WASTE PROFILE NUMBER CA611751 AS MATERIAL FROM THESE DECISION UNITS WILL REQUIRE TREATMENT/STABILIZATION AT THE LANDFILL.
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| 13G           | 18                             | 139                                    | 32.92                                   | 32.92                                    |
| 8H            | 24                             | 185                                    | 33.50                                   | 33.50                                    |
| 12J           | 18                             | 139                                    | 32.33                                   | 32.33                                    |
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| 9W            | 12                             | 93                                     | 32.88                                   | 32.88                                    |
| 10Y           | 12                             | 93                                     | 32.63                                   | 32.63                                    |
| 20Z           | 12                             | 93                                     | 31.90                                   | 31.90                                    |
| 21Z           | 12                             | 93                                     | 32.08                                   | 32.08                                    |
| 24Z           | 12                             | 93                                     | 32.06                                   | 32.06                                    |
| 16BB          | 12                             | 93                                     | 32.54                                   | 32.54                                    |
| 18BB          | 18                             | 139                                    | 33.30                                   | 33.30                                    |
| 15DD          | 12                             | 93                                     | 32.73                                   | 32.73                                    |
| 14FF          | 12                             | 93                                     | 32.80                                   | 32.80                                    |
| 9GG           | 12                             | 93                                     | 33.09                                   | 33.09                                    |
| 28HH          | 18                             | 139                                    | 33.29                                   | 33.29                                    |
| I18           | 12                             | 93                                     | 33.28                                   | 33.28                                    |
| 27PP          | 12                             | 93                                     | 32.75                                   | 32.75                                    |

TOTAL 2,785  
3,342  
5,013  
CY (IN-PLACE)  
CY (WITH 20% EXPANSION)  
TONS (AT 1 CY=1.5 TONS)

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- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- 50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
- 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY



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| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                                                                                 |                                                                              |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| PROJECT ENGINEER<br>ERCAN CANDAN, P.E. C72067<br>PROJECT MANAGER<br>PRINT NAME: | REVIEWED BY:<br>for Agency / Utility<br>REVIEWED BY:<br>for Agency / Utility |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

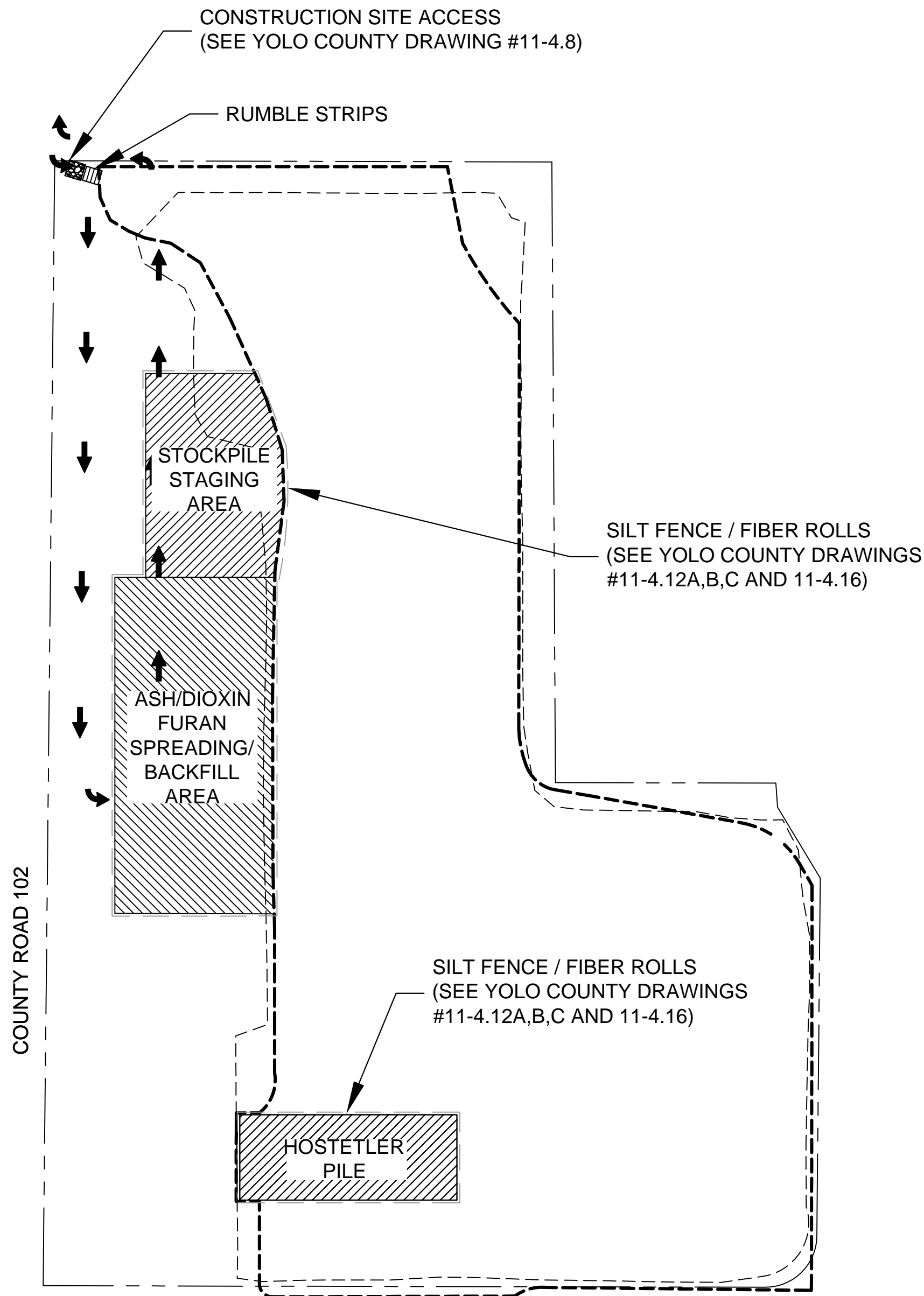
GRADING PLAN-DECISION UNIT GRADING

SHEET 5  
OF  
11 SHEETS



NOTES:

1. STORMWATER QUALITY, EROSION AND SEDIMENT CONTROL MEASURES WILL BE IN ACCORDANCE WITH SECTION 11 OF YOLO COUNTY IMPROVEMENT STANDARDS.
2. A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN PREPARED BY CONTRACTOR. A DESIGN FOR FINALIZATION BY CONTRACTOR IS INCLUDED IN THE ASH REMOVAL WORKPLAN. CONTRACTOR WILL FINALIZE AND SIGN THE SWPPP. WASTE DISCHARGE IDENTIFICATION NUMBER IS 5S57C378592.
3. DRAINAGE AND EROSION CONTROL MEASURES WILL BE IMPLEMENTED IN THE EVENT OF RAIN. ANY POTENTIALLY AFFECTED DRAINAGE DITCHES SHALL BE PROTECTED.
4. THESE MEASURES WOULD INCLUDE SILT FENCING, FIBER ROLLS, SAND BAGS, OR CONTAINMENT BERMS AS NECESSARY FOR SPECIFIC SITE CONDITIONS.
5. THE MINIMUM BEST MANAGEMENT PRACTICES (BMPs) ARE SHOWN ON THIS SHEET AND THE PROJECT SWPPP AND WILL BE INSTALLED AT ACTIVE EXCAVATION LOCATIONS.
6. UPON COMPLETION OF GRADING, HYDROSEED ALL DISTURBED AREAS IN GENERAL COMPLIANCE WITH YOLO COUNTY IMPROVEMENT STANDARDS SECTION 11-4.6.
7. YOLO COUNTY STANDARD BMP INSTALLATION SPECIFICATIONS FOR THE MINIMUM BMPs ARE PROVIDED BELOW.

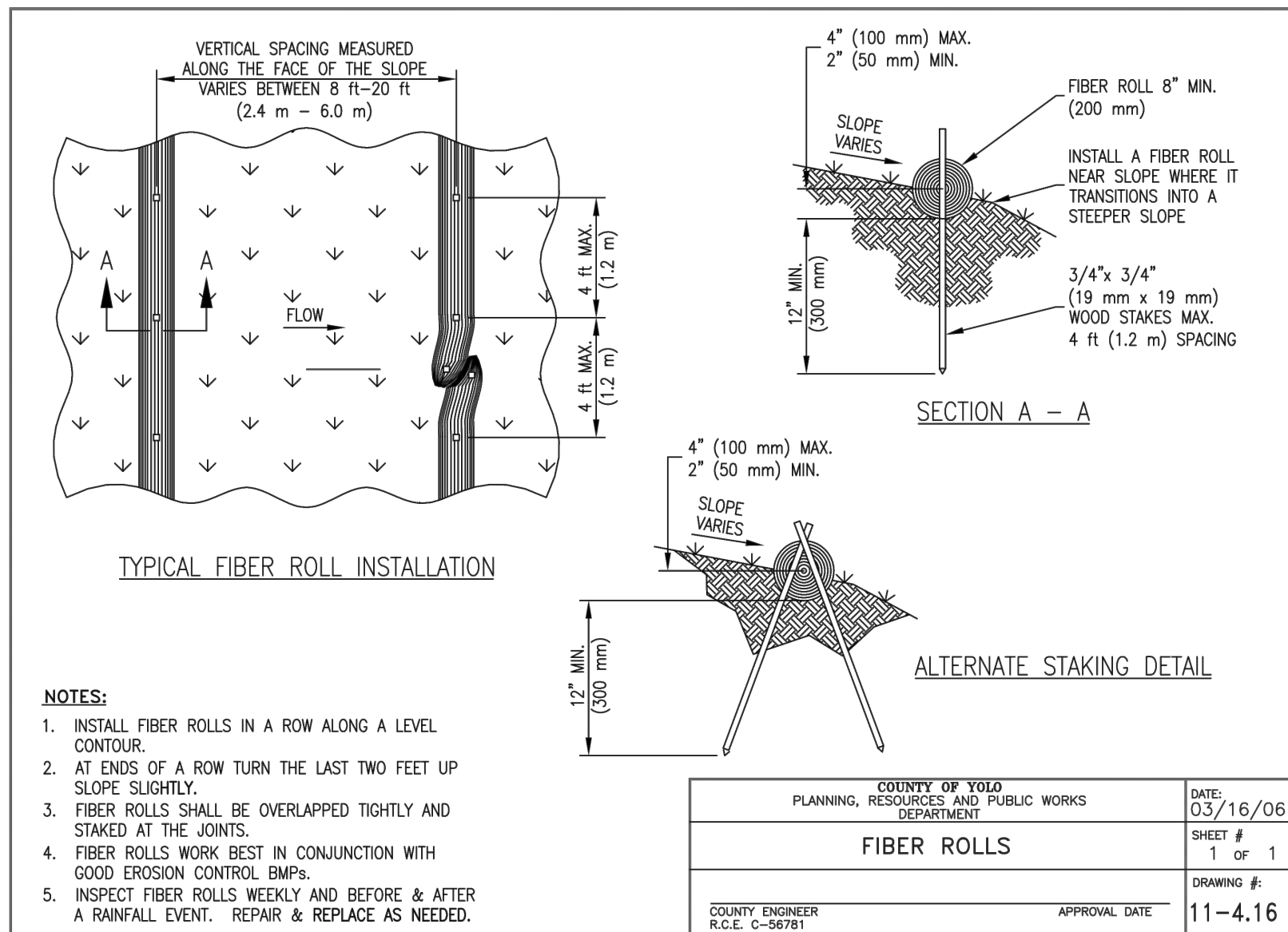
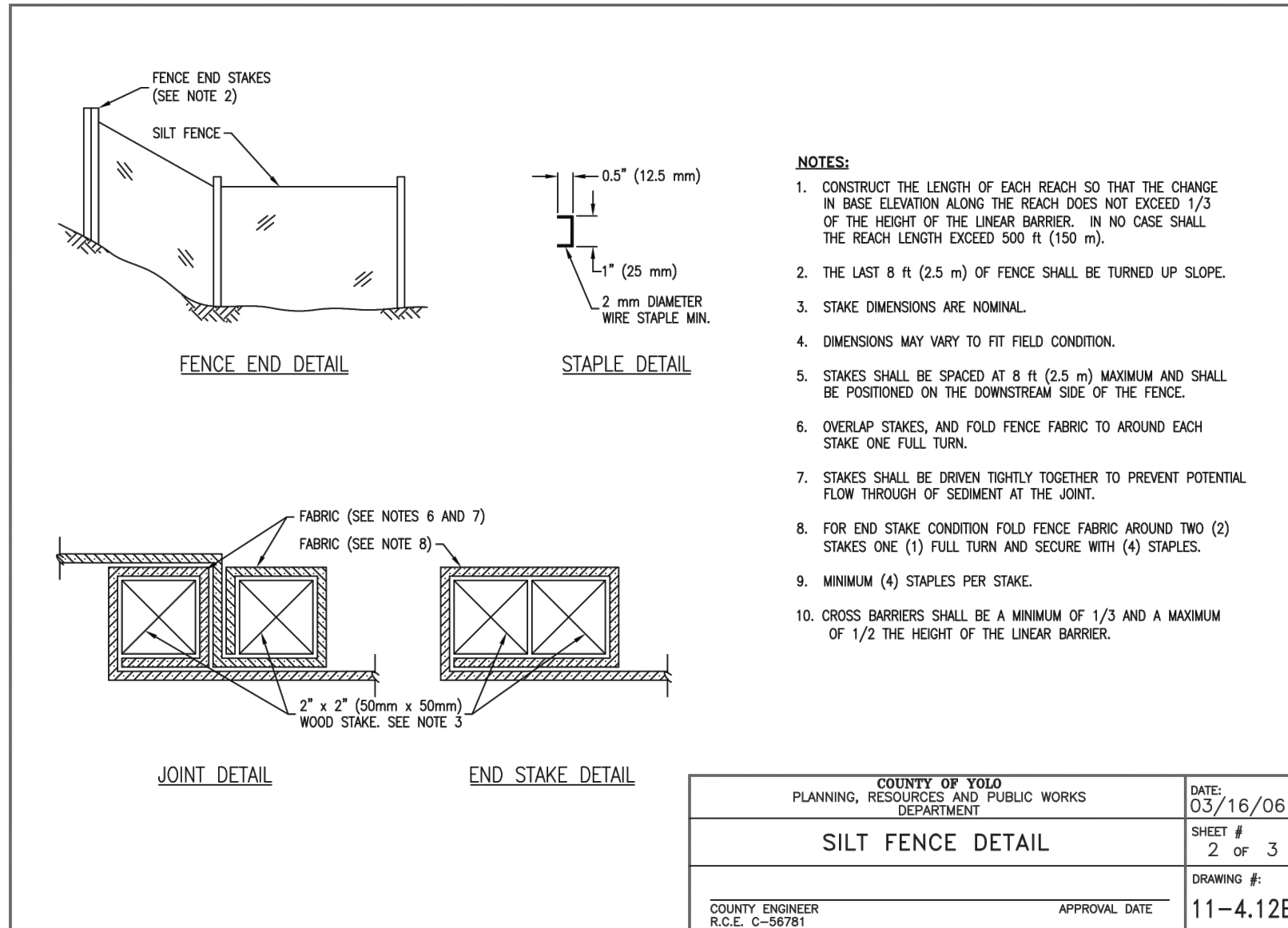
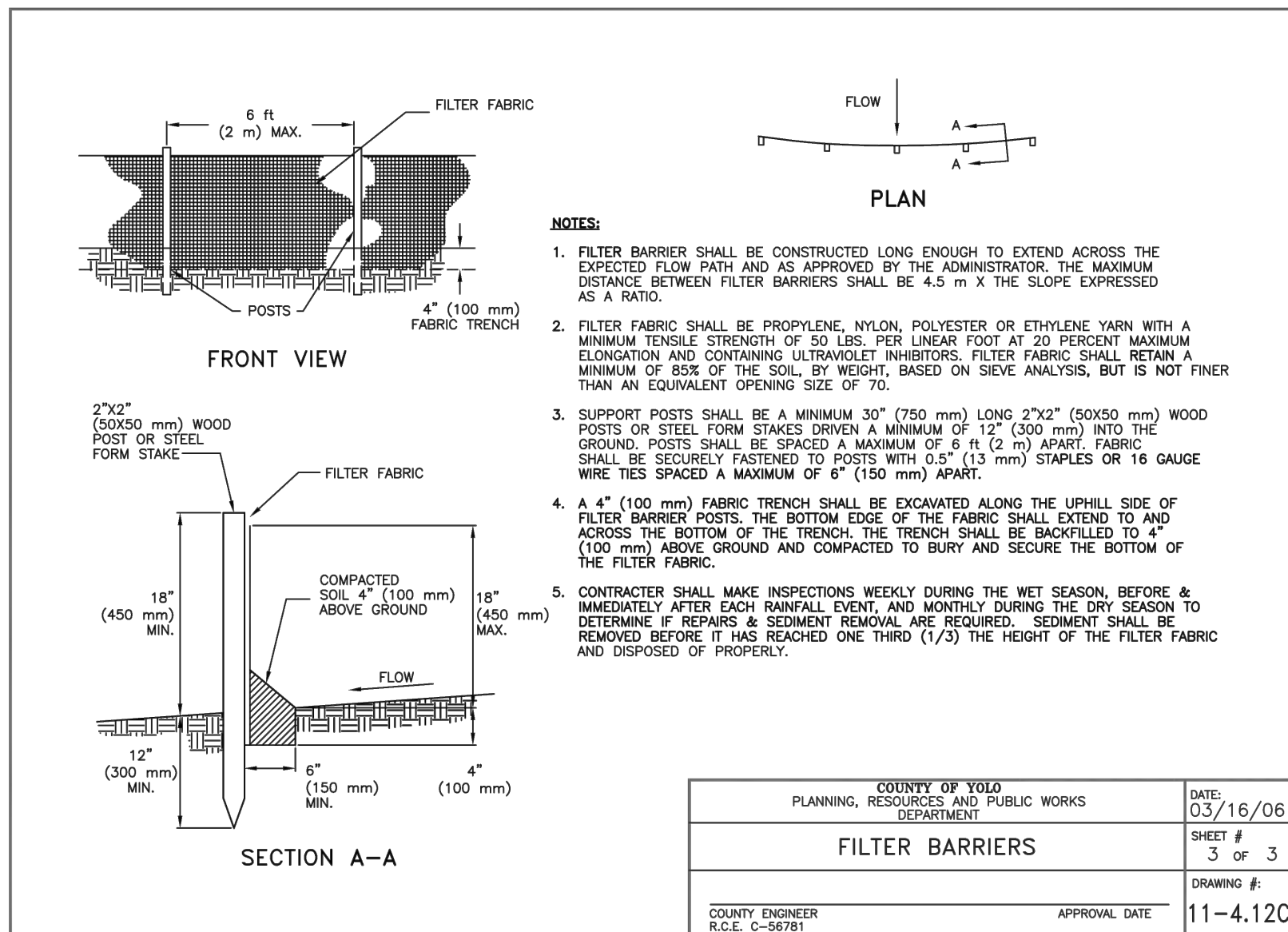
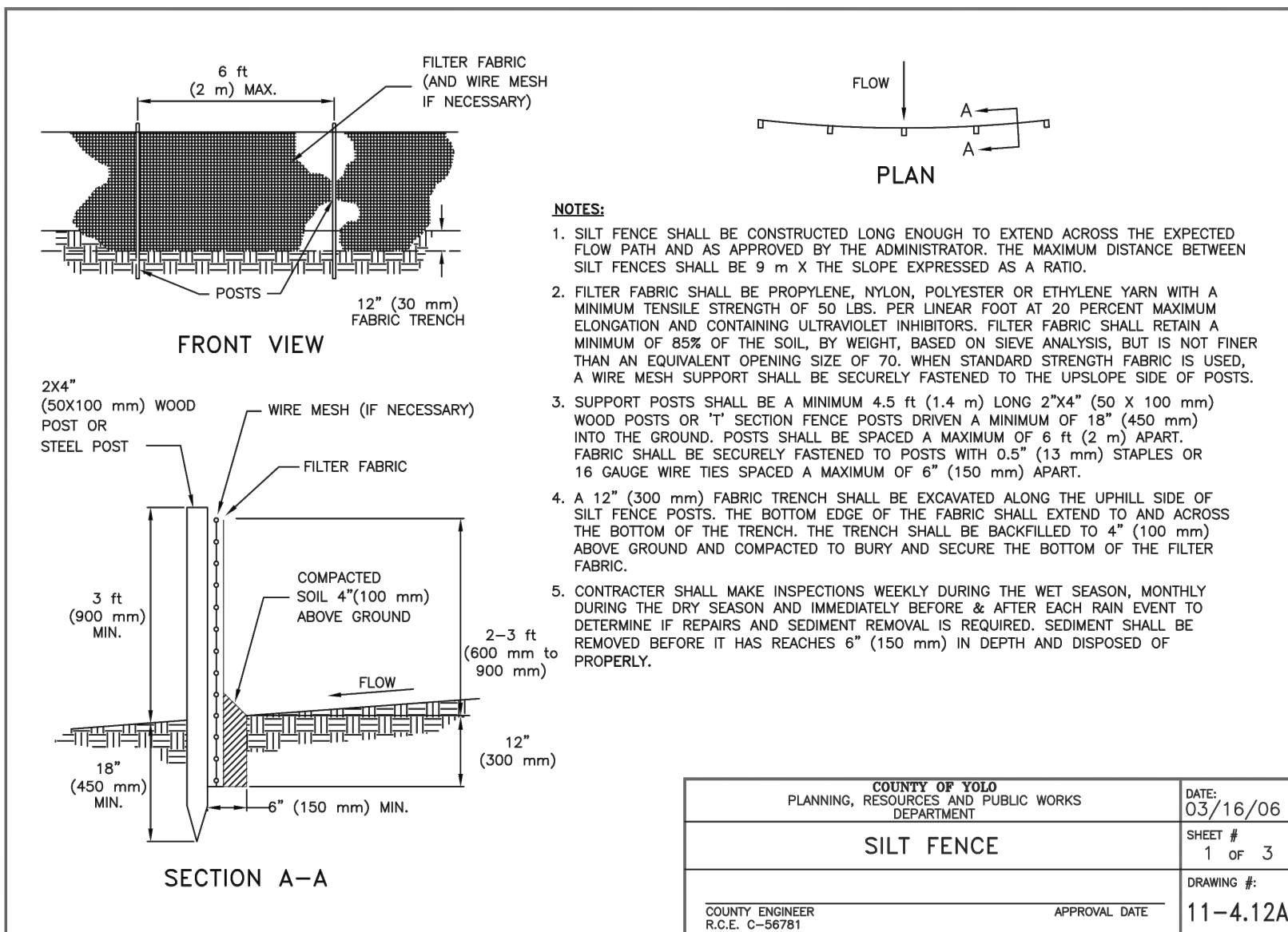
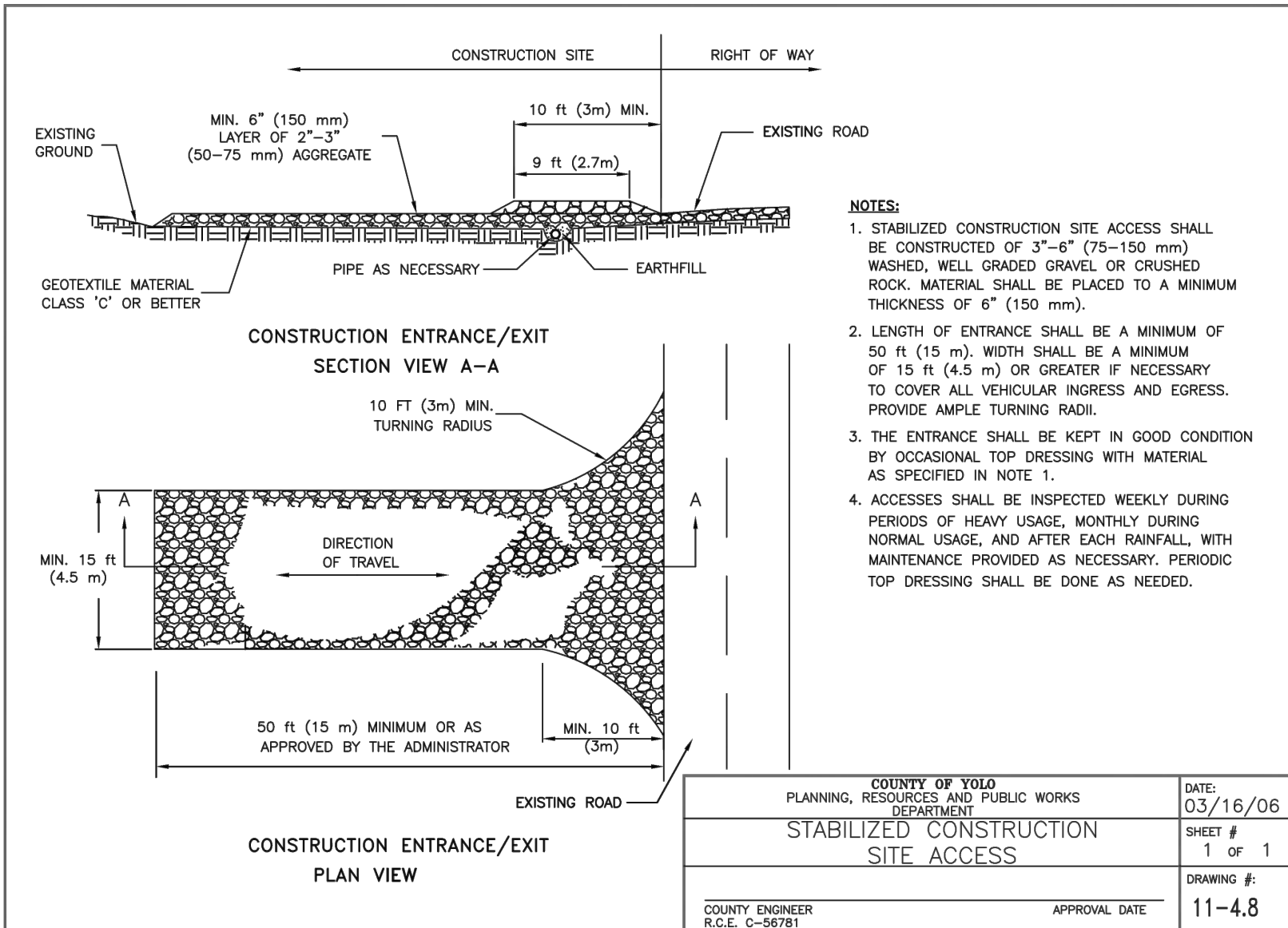
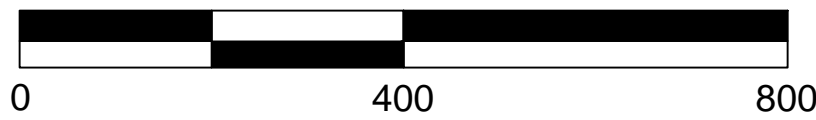


LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- ONSITE STAFF ACCESS ROAD



SCALE (FEET)



ATTENTION:

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UNAUTHORIZED CHANGES & USES

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|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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IRVINE, CA 92618  
Phone: 949.341.7447  
www.trcsolutions.com

|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
|                           | for Agency / Utility |
| PRINT NAME:               |                      |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

EROSION CONTROL PLAN

SHEET 6  
OF  
11 SHEETS





**TRAFFIC CONTROL NOTES:**

1. TRAFFIC CONTROL SHALL CONSIST OF ALL WORK AND MATERIALS NECESSARY TO MAINTAIN TRAFFIC AND ACCESS DURING ALL STAGES OF THE CONSTRUCTION AS SHOWN ON THIS SHEET AND IN GENERAL WORK PLAN.
2. THE ACCESS ROUTE TO THE WORK AREA IS SHOWN ON THE DRAWING. USE ONLY THE ACCESS ROUTE DESIGNATED ON THIS DRAWING.
3. TRUCKS SHALL ENTER THE SITE FROM THE NORTHERN ACCESS POINT AND TRAVEL ALONG THE EASTERN PROPERTY BOUNDARY TO GET TO THE STOCKPILE AREA AND EXIT FROM THE NORTHERN ACCESS POINT.
4. TRUCKS SHALL AVOID CITY STREETS AS MUCH AS POSSIBLE DURING TRANSPORTATION OF ASH TO THE OFFSITE LANDFILL.
5. TRUCKS ENTERING/EXITING SIGNS SHALL BE INSTALLED AT DESIGNATED LOCATIONS.
6. FLAGGER WILL BE REQUIRED AT THIS SITE ENTRANCE / EXIT. TRAFFIC ON NORTH BOUND MAY BE STOPPED INTERMITTENTLY BETWEEN 6:30 AM AND 11:30 AM TO DIRECT END DUMP TRUCKS IN / OUT OF THE SITE.
7. TRUCKS SHALL OBEY ALL POSTED SPEED LIMITS DURING TRAVEL TO AND FROM THE SITE.
8. TRUCKS SHALL NEVER HAUL MATERIAL IN EXCESS OF THE LEGAL LOAD LIMIT, AND ALL LOADS SHALL BE TARPED.
9. THE CONTRACTOR SHALL REMOVE AND REPLACE TRAFFIC CONTROL MARKINGS AND SYSTEMS THROUGHOUT THE CONSTRUCTION STAGES.
10. THE CONTRACTOR SHALL COOPERATE WITH THE SITE QUALITY CONTROL OFFICER RELATIVE TO HANDLING TRAFFIC AROUND THE CONSTRUCTION AREA AND SHALL MAKE ARRANGEMENTS RELATIVE TO KEEPING THE WORKING AREA CLEAR OF PARKED VEHICLES.
11. IN ORDER TO MINIMIZE DUST MIGRATION FROM SITE, 10-MPH SHALL BE IMPLEMENTED WHILE DRIVING IN DIRT ROADS WITHIN THE SITE.
12. DAMAGE DONE BY THE CONTRACTOR DURING THE COURSE OF WORK TO ADJACENT PROPERTIES SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ADJACENT PROPERTY OWNERS.
13. PERSONAL VEHICLES OF THE CONTRACTOR'S EMPLOYEES, AND THE CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL NOT BE PARKED ON THE TRAVELED WAY OR SHOULDERS AT ANY TIME. WHEN ENTERING OR LEAVING ROADWAYS CARRYING PUBLIC TRAFFIC, THE CONTRACTOR'S EQUIPMENT, WHETHER EMPTY OR LOADED, SHALL IN ALL CASES YIELD TO PUBLIC TRAFFIC AND SHALL TRAVEL IN THE DIRECTION OF THE TRAFFIC. FLAGGERS AND TRAFFIC SIGNS MAY BE REQUIRED TO CONTROL THIS ACTIVITY.

- 2** ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 3** PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 5** DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.
- 7** ACCESS ROADS TO PERSONNEL PARKING AND EQUIPMENT STORAGE AREA.
- 8** ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

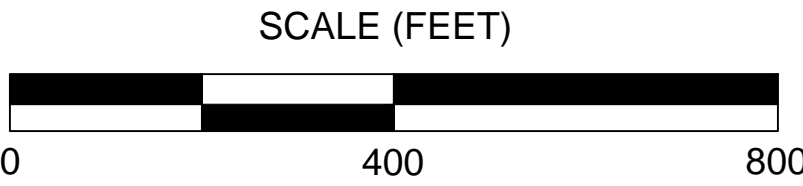
**TRUCK AND FLAGGER SIGNS**



W20-7  
FLAGGER AHEAD

**LEGEND:**

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- TRUCK TRAFFIC SIGN
- FLAGGER



**ATTENTION:**  
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|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
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| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                           |      |
|---------------------------|------|
| PROJECT ENGINEER          | DATE |
| ERCAN CANDAN, P.E. C72067 |      |
| PROJECT MANAGER           | DATE |
|                           |      |
| PRINT NAME:               | DATE |

|                      |      |
|----------------------|------|
| REVIEWED BY:         | DATE |
| for Agency / Utility |      |
| REVIEWED BY:         | DATE |
| for Agency / Utility |      |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

**TRAFFIC CONTROL PLAN**





SHEET 7  
OF  
11 SHEETS



NOTES:

ALL NOTES ON SHEETS 2, 4, AND 5 APPLY TO DIOXIN FURAN CONTAINING DECISION UNITS DESCRIBED ON THIS SHEET. ADDITIONAL NOTES FOR THE ALTERNATIVES AS DESCRIBED IN THE BID DOCUMENTS PROVIDED BELOW





- EXCAVATE ASH FROM DIOXIN FURAN DECISION UNITS PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
- REMOVE METAL DEBRIS FROM DIOXIN FURAN CONTAINING ASH AS DESCRIBED IN SHEETS 10 AND 11 FOR USE AS BACKFILL ONSITE.
- SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED, ON-SITE IN 3" LAYERS AND DISKING INTO NATIVE SOILS BENEATH DECISION UNITS WHERE ASH HAS BEEN REMOVED. COMPLETE BACKFILLING OF THE EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
- SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED IN ON-SITE AREAS WITHOUT ASH IN 3" LAYERS AND DISK INTO NATIVE SOILS WITHIN THE AREA SHOWN ON THESE PLANS.

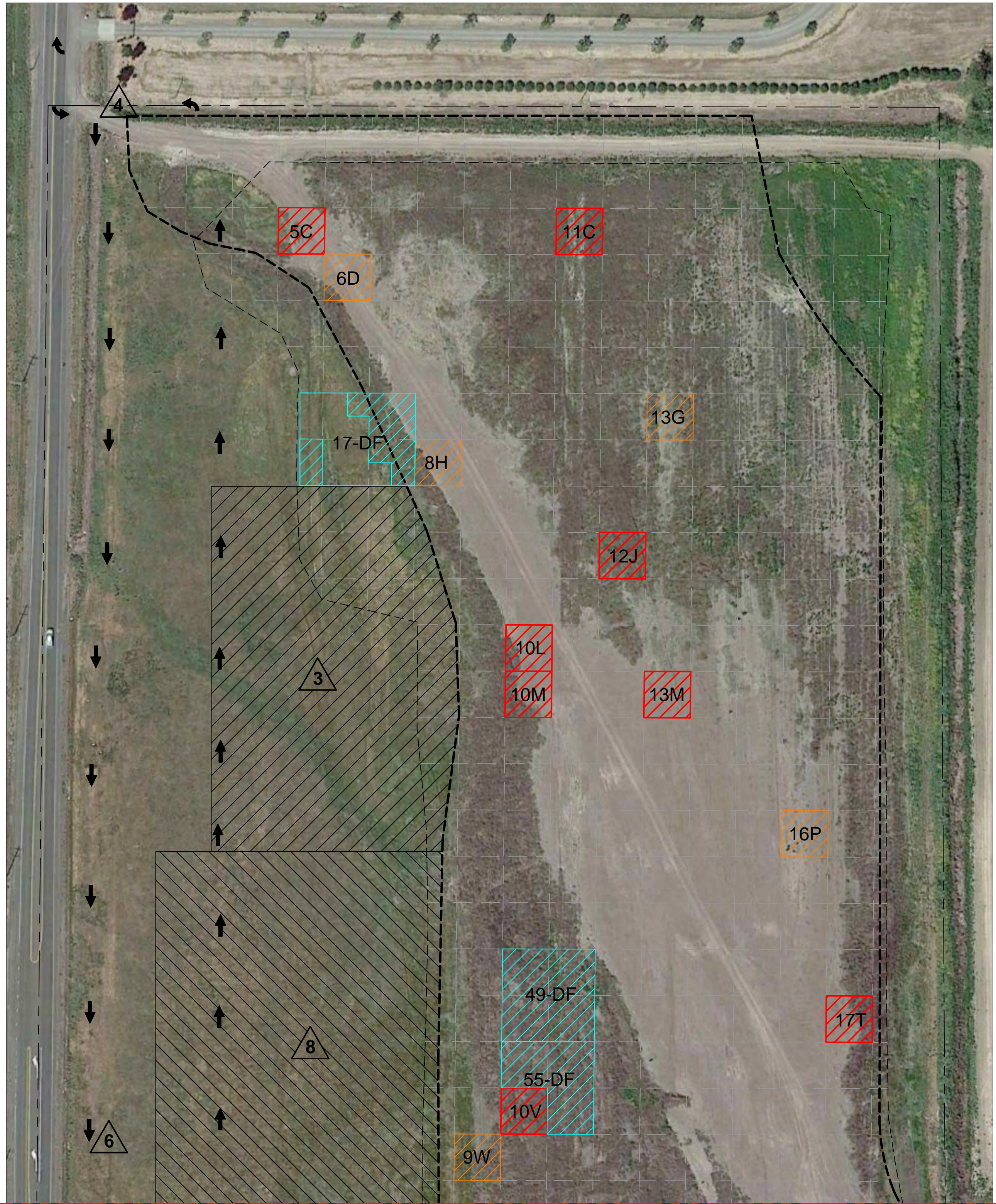
-  PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
-  CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
-  DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
-  ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

| Dioxin/Furan Units | Decision Unit Grids | Maximum Ash Thickness (Inches) | Estimated Removal Volume (Cubic Yards) | Current Ground Surface Elevation (feet) | Proposed Ground Surface Elevation (feet) |
|--------------------|---------------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 17-DF              | 6G                  | 6                              | 12                                     | 32.85                                   | 32.85                                    |
|                    | 7G                  | 14                             | 108                                    | 32.71                                   | 32.71                                    |
|                    | 5H                  | 6                              | 20                                     | 33.41                                   | 33.41                                    |
|                    | 7H                  | 6                              | 24                                     | 32.69                                   | 32.69                                    |
|                    | 10S                 | 8                              | 60                                     | 32.57                                   | 32.57                                    |
| 49-DF              | 11S                 | 8                              | 60                                     | 32.80                                   | 32.8                                     |
|                    | 10T                 | 8                              | 60                                     | 32.66                                   | 32.66                                    |
|                    | 11T                 | 10                             | 76                                     | 32.58                                   | 32.58                                    |
|                    | 10U                 | 8                              | 45                                     | 32.70                                   | 32.7                                     |
| 55-DF              | 11U                 | 10                             | 57                                     | 32.89                                   | 32.89                                    |
|                    | 11V                 | 9                              | 51                                     | 32.74                                   | 32.74                                    |
|                    | 10AA                | 6                              | 36                                     | 32.59                                   | 32.59                                    |
| 77-DF              | 9BB                 | 6                              | 36                                     | 32.81                                   | 32.81                                    |
|                    | 10BB                | 6                              | 36                                     | 32.77                                   | 32.77                                    |
| 80-DF              | 23CC                | 12                             | 92                                     | 32.84                                   | 32.84                                    |
|                    | 24CC                | 12                             | 92                                     | 32.07                                   | 32.07                                    |
|                    | 23DD                | 12                             | 92                                     | 32.92                                   | 32.92                                    |
|                    | 24DD                | 12                             | 92                                     | 32.34                                   | 32.34                                    |
| 81-DF              | 21CC                | 7                              | 56                                     | 32.01                                   | 32.01                                    |
|                    | 22CC                | 10                             | 76                                     | 32.34                                   | 32.34                                    |
|                    | 21DD                | 11                             | 84                                     | 32.38                                   | 32.38                                    |
|                    | 22DD                | 12                             | 92                                     | 32.60                                   | 32.6                                     |
| 88-DF              | 29DD                | 10                             | 38                                     | 32.78                                   | 32.78                                    |
|                    | 29EE                | 12                             | 46                                     | 32.35                                   | 32.35                                    |
|                    | 29FF                | 14                             | 54                                     | 32.17                                   | 32.17                                    |
|                    | 29GG                | 15                             | 58                                     | 32.37                                   | 32.37                                    |
| 91-DF              | 23EE                | 12                             | 92                                     | 32.85                                   | 32.85                                    |
|                    | 24EE                | 12                             | 92                                     | 32.42                                   | 32.42                                    |
|                    | 23FF                | 10                             | 40                                     | 32.94                                   | 32.94                                    |
|                    | 24FF                | 12                             | 92                                     | 32.24                                   | 32.24                                    |
| 94-DF              | 17EE                | 11                             | 84                                     | 32.86                                   | 32.86                                    |
|                    | 18EE                | 9                              | 68                                     | 32.82                                   | 32.82                                    |
|                    | 17FF                | 10                             | 76                                     | 33.02                                   | 33.02                                    |
|                    | 18FF                | 10                             | 76                                     | 32.63                                   | 32.63                                    |
| 100-DF             | 23GG                | 12                             | 92                                     | 33.35                                   | 33.35                                    |
|                    | 24GG                | 14                             | 27                                     | 32.49                                   | 32.49                                    |
|                    | 23HH                | 12                             | 92                                     | 33.46                                   | 33.46                                    |
|                    | 24HH                | 12                             | 92                                     | 32.62                                   | 32.62                                    |
| 104-DF             | 15GG                | 9                              | 68                                     | 32.75                                   | 32.75                                    |
|                    | 16GG                | 10                             | 76                                     | 32.85                                   | 32.85                                    |
|                    | 15HH                | 6                              | 36                                     | 32.68                                   | 32.68                                    |
|                    | 16HH                | 10                             | 76                                     | 32.76                                   | 32.76                                    |
| 111-DF             | 21II                | 13                             | 100                                    | 32.67                                   | 32.67                                    |
|                    | 22II                | 12                             | 92                                     | 33.21                                   | 33.21                                    |
|                    | 21JJ                | 13                             | 100                                    | 32.68                                   | 32.68                                    |
|                    | 22JJ                | 12                             | 92                                     | 33.29                                   | 33.29                                    |
| 127-DF             | 21MM                | 10                             | 76                                     | 33.07                                   | 33.07                                    |
|                    | 22MM                | 11                             | 84                                     | 33.15                                   | 33.15                                    |
|                    | 21NN                | 10                             | 76                                     | 32.83                                   | 32.83                                    |
|                    | 22NN                | 12                             | 92                                     | 33.15                                   | 33.15                                    |

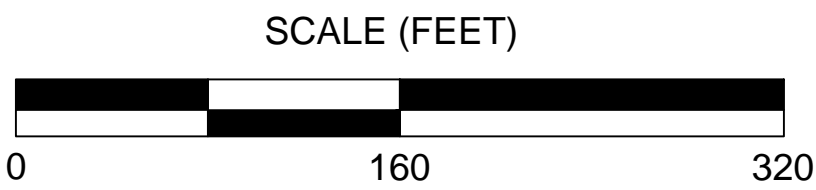
TOTAL 3444 5166 CY (IN-PLACE) TONS (AT 1CY = 1.5 TONS)

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
-  50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH
-  50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
-  50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY
-  100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA



MATCHLINE - SEE SHEET 9



|     |           |    |                                                                                                 |
|-----|-----------|----|-------------------------------------------------------------------------------------------------|
| 1   | 2/23/2017 | WC | ADJUSTED PROPERTY APN BOUNDARY ON SHEETS 3, 4, 6, AND 7.                                        |
| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
| PRINT NAME:               | for Agency / Utility |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY  
GRADING PLAN-DECISION UNIT GRADING DIOXIN FURAN REMOVAL

SHEET 8  
OF  
11 SHEETS



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NOTES:

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1. EXCAVATE ASH FROM DIOXIN FURAN DECISION UNITS PER DIRECTION OF THE ENGINEER, LOAD ONTO SMALL TRUCK(S) AND TRANSPORT TO THE TEMPORARY STOCKPILE STAGING AREA.
2. REMOVE METAL DEBRIS FROM DIOXIN FURAN CONTAINING ASH AS DESCRIBED IN SHEETS 10 AND 11 FOR USE AS BACKFILL ONSITE.
3. SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED, ON-SITE IN 3" LAYERS AND DISKING INTO NATIVE SOILS BENEATH DECISION UNITS WHERE ASH HAS BEEN REMOVED. COMPLETE BACKFILLING OF THE EXCAVATED DECISION UNITS TO THEIR RESPECTIVE PRE-EXCAVATION GRADE ELEVATION USING SUITABLE MATERIAL FROM THE ONSITE STOCKPILE IDENTIFIED AS HOSTETLER PILE ON SHEET 3. TABLE BELOW PROVIDES PRE-GRADING SURFACE ELEVATION FOR DECISION UNITS TO BE EXCAVATED.
4. SPREAD DIOXIN/FURAN CONTAINING ASH, FROM WHICH METAL DEBRIS HAS BEEN REMOVED IN ON-SITE AREAS WITHOUT ASH IN 3" LAYERS AND DISK INTO NATIVE SOILS WITHIN THE AREA SHOWN ON THESE PLANS.

2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.

5 DESIGNATED CONSTRUCTION PERSONNEL PARKING, EQUIPMENT STORAGE, AND RESTROOM FACILITIES LOCATION.

| Dioxin/Furan Units | Decision Unit Grids | Maximum Ash Thickness (Inches) | Estimated Removal Volume (Cubic Yards) | Current Ground Surface Elevation (feet) | Proposed Ground Surface Elevation (feet) |
|--------------------|---------------------|--------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|
| 17-DF              | 6G                  | 6                              | 12                                     | 32.85                                   | 32.85                                    |
|                    | 7G                  | 14                             | 108                                    | 32.71                                   | 32.71                                    |
|                    | 5H                  | 6                              | 20                                     | 33.41                                   | 33.41                                    |
|                    | 7H                  | 6                              | 24                                     | 32.69                                   | 32.69                                    |
| 49-DF              | 10S                 | 8                              | 60                                     | 32.57                                   | 32.57                                    |
|                    | 11S                 | 8                              | 60                                     | 32.80                                   | 32.8                                     |
|                    | 10T                 | 8                              | 60                                     | 32.66                                   | 32.66                                    |
|                    | 11T                 | 10                             | 76                                     | 32.58                                   | 32.58                                    |
| 55-DF              | 10U                 | 8                              | 45                                     | 32.70                                   | 32.7                                     |
|                    | 11U                 | 10                             | 57                                     | 32.89                                   | 32.89                                    |
|                    | 11V                 | 9                              | 51                                     | 32.74                                   | 32.74                                    |
| 77-DF              | 10AA                | 6                              | 36                                     | 32.59                                   | 32.59                                    |
|                    | 98B                 | 6                              | 36                                     | 32.81                                   | 32.81                                    |
|                    | 108B                | 6                              | 36                                     | 32.77                                   | 32.77                                    |
| 80-DF              | 23CC                | 12                             | 92                                     | 32.84                                   | 32.84                                    |
|                    | 24CC                | 12                             | 92                                     | 32.07                                   | 32.07                                    |
|                    | 23DD                | 12                             | 92                                     | 32.92                                   | 32.92                                    |
|                    | 24DD                | 12                             | 92                                     | 32.34                                   | 32.34                                    |
| 81-DF              | 21CC                | 7                              | 56                                     | 32.01                                   | 32.01                                    |
|                    | 22CC                | 10                             | 76                                     | 32.34                                   | 32.34                                    |
|                    | 21DD                | 11                             | 84                                     | 32.38                                   | 32.38                                    |
|                    | 22DD                | 12                             | 92                                     | 32.60                                   | 32.6                                     |
| 88-DF              | 29DD                | 10                             | 38                                     | 32.78                                   | 32.78                                    |
|                    | 29EE                | 12                             | 46                                     | 32.35                                   | 32.35                                    |
|                    | 29FF                | 14                             | 54                                     | 32.17                                   | 32.17                                    |
|                    | 29GG                | 15                             | 58                                     | 32.37                                   | 32.37                                    |
| 91-DF              | 23EE                | 12                             | 92                                     | 32.85                                   | 32.85                                    |
|                    | 24EE                | 12                             | 92                                     | 32.42                                   | 32.42                                    |
|                    | 23FF                | 10                             | 40                                     | 32.94                                   | 32.94                                    |
|                    | 24FF                | 12                             | 92                                     | 32.24                                   | 32.24                                    |
| 94-DF              | 17EE                | 11                             | 84                                     | 32.86                                   | 32.86                                    |
|                    | 18EE                | 9                              | 68                                     | 32.82                                   | 32.82                                    |
|                    | 17FF                | 10                             | 76                                     | 33.02                                   | 33.02                                    |
|                    | 18FF                | 10                             | 76                                     | 32.63                                   | 32.63                                    |
| 100-DF             | 23GG                | 12                             | 92                                     | 33.35                                   | 33.35                                    |
|                    | 24GG                | 14                             | 27                                     | 32.49                                   | 32.49                                    |
|                    | 23HH                | 12                             | 92                                     | 33.46                                   | 33.46                                    |
|                    | 24HH                | 12                             | 92                                     | 32.62                                   | 32.62                                    |
| 104-DF             | 15GG                | 9                              | 68                                     | 32.75                                   | 32.75                                    |
|                    | 16GG                | 10                             | 76                                     | 32.85                                   | 32.85                                    |
|                    | 15HH                | 6                              | 36                                     | 32.68                                   | 32.68                                    |
|                    | 16HH                | 10                             | 76                                     | 32.76                                   | 32.76                                    |
| 111-DF             | 21II                | 13                             | 100                                    | 32.67                                   | 32.67                                    |
|                    | 22II                | 12                             | 92                                     | 33.21                                   | 33.21                                    |
|                    | 21JJ                | 13                             | 100                                    | 32.68                                   | 32.68                                    |
|                    | 22JJ                | 12                             | 92                                     | 33.29                                   | 33.29                                    |
| 127-DF             | 21MM                | 10                             | 76                                     | 33.07                                   | 33.07                                    |
|                    | 22MM                | 11                             | 84                                     | 33.15                                   | 33.15                                    |
|                    | 21NN                | 10                             | 76                                     | 32.83                                   | 32.83                                    |
|                    | 22NN                | 12                             | 92                                     | 33.15                                   | 33.15                                    |

LEGEND:

--- APPROXIMATE SITE BOUNDARY

--- APPROXIMATE EXTENT OF ASH

--- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS

50' x 50' DECISION UNITS ASSESSED WITHIN THE APPROXIMATE EXTENT OF THE ASH

50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE

50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY

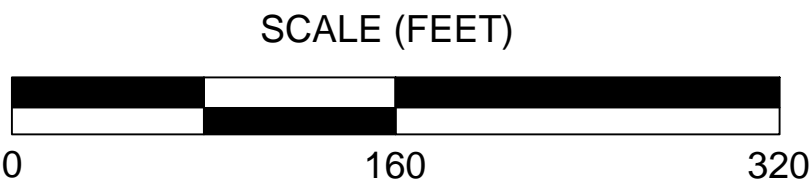
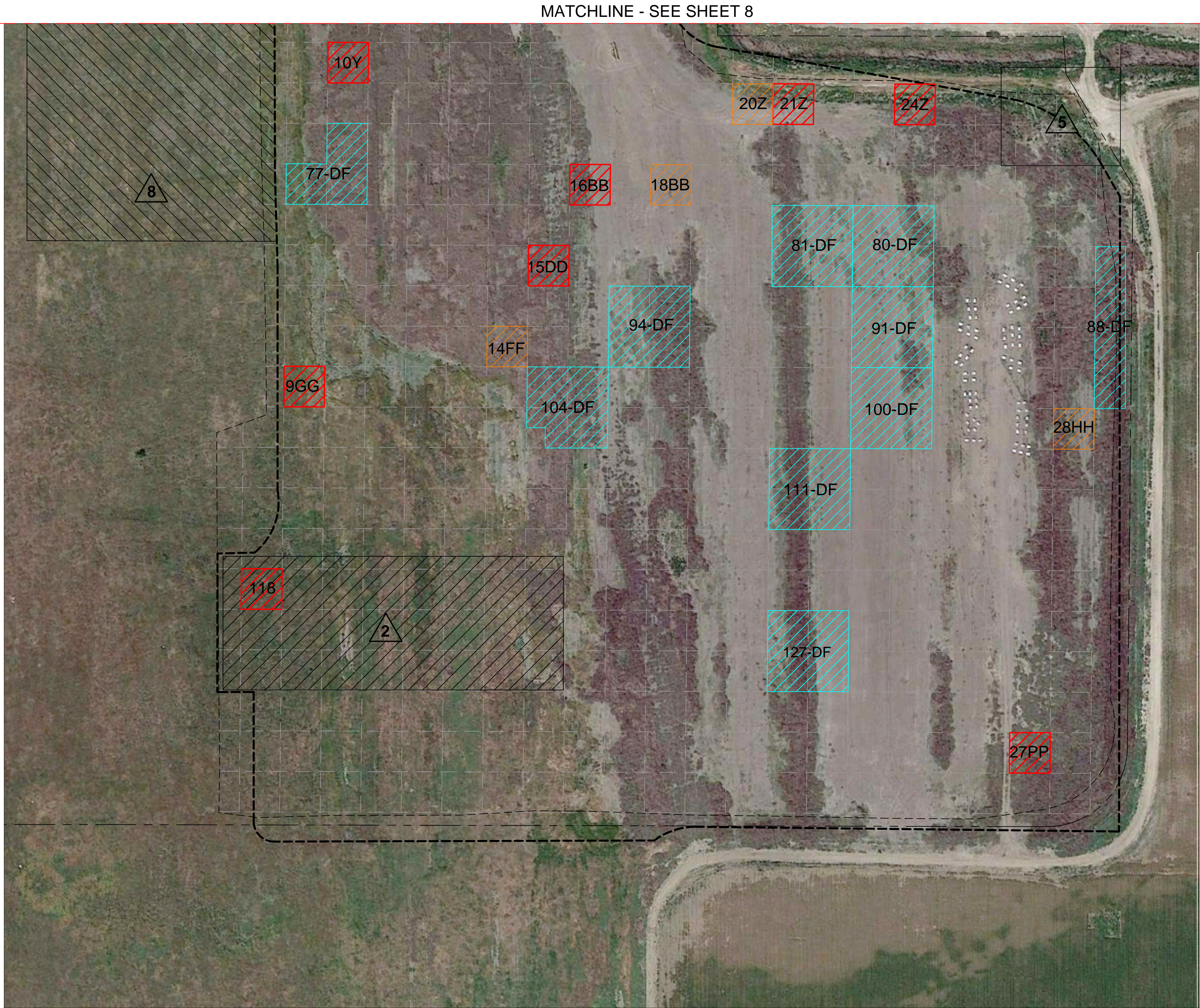
100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA

TOTAL 3444 5166 CY (IN-PLACE) TONS (AT 1CY = 1.5 TONS)



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|     |           |    |                                                                                                 |
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| 2   | 3/27/2017 | WC | ADDED SHEETS 8, 9, 10, AND 11 FOR DIOXIN FURAN AND NAIL REMOVAL DETAILS                         |
|     |           |    | REVISED PROJECT DESCRIPTION, DURATION, AND ADDED DIOXIN FURAN CONTAINING ASH SPREADING LOCATION |
| REV | DATE      | BY | DESCRIPTION                                                                                     |



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|                           |                      |
|---------------------------|----------------------|
| PROJECT ENGINEER          | REVIEWED BY:         |
| ERCAN CANDAN, P.E. C72067 | for Agency / Utility |
| PROJECT MANAGER           | REVIEWED BY:         |
| PRINT NAME:               | for Agency / Utility |

|      |      |
|------|------|
| DATE | DATE |
| DATE | DATE |

REMEDIAL GRADING, EROSION & SEDIMENT CONTROL, AND TRAFFIC CONTROL PLANS  
LILLARD RANCH PROPERTY

GRADING PLAN-DECISION UNIT GRADING DIOXIN FURAN REMOVAL



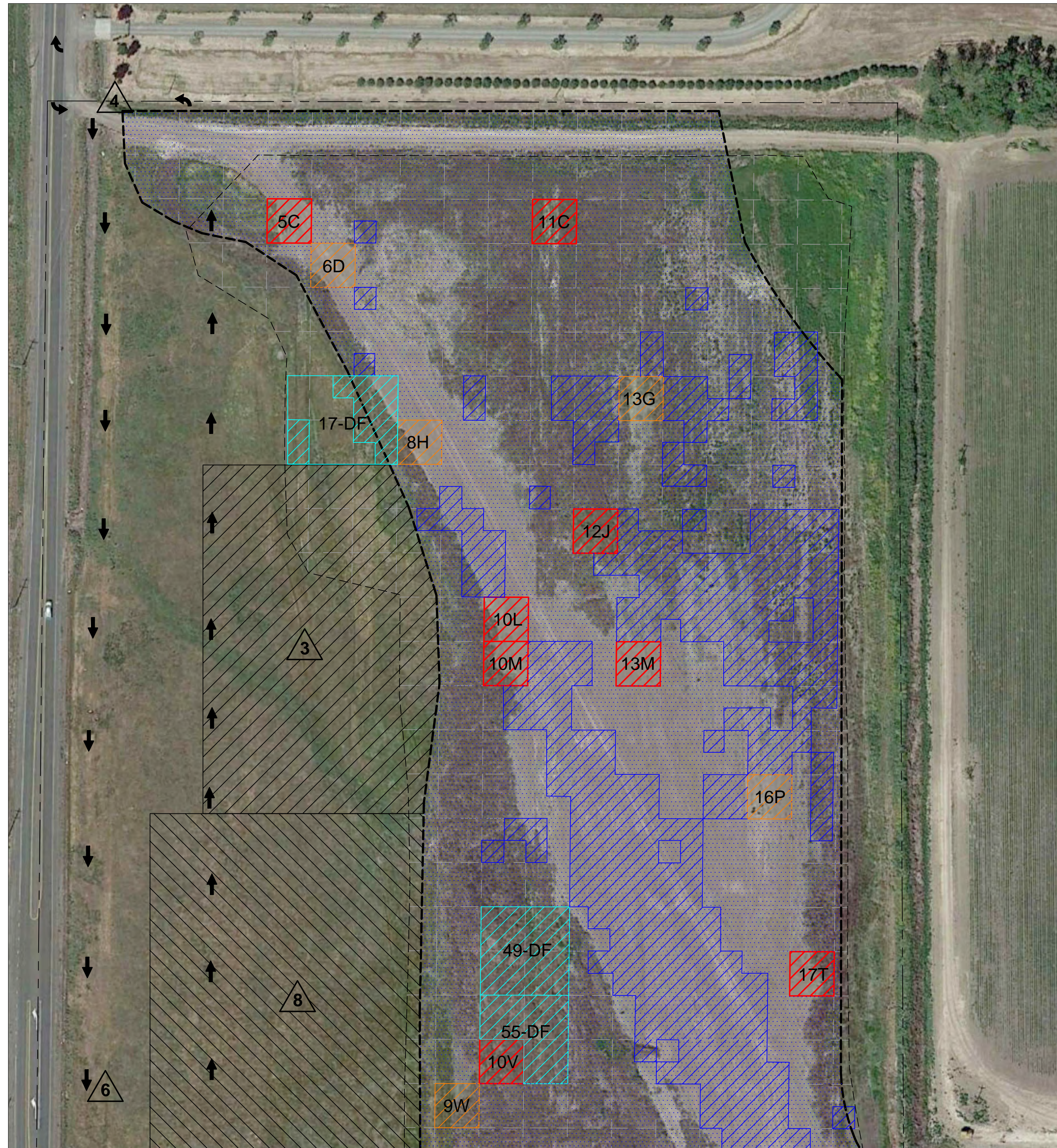
NOTES:

1. LOOSEN ASH IN THE NON-EXCAVATED DECISION UNITS THROUGHOUT THE SITE BY PLOWING/DISKING TO 10-INCHES AND REMOVE METALLIC DEBRIS FROM SURFACE TO 10-INCH DEPTH USING A MAGNET.
2. WHERE ASH THICKNESS IS GREATER THAN 10-INCHES, COMPLETE AN ADDITIONAL PASS OF THE PLOW DISK TO LOOSEN THE DEEPER ASH AND REMOVE METALLIC DEBRIS BELOW 10-INCHES USING A MAGNET. THE MAXIMUM DEPTH OF METALLIC DEBRIS REMOVAL IS ANTICIPATED TO BE 20 TO 24 INCHES.
3. DISPOSE METALLIC DEBRIS AT APPROPRIATE OFFSITE DISPOSAL FACILITY.
4. WHEEL ROLL AND LIGHTLY COMPACT DISTURBED DECISION UNITS THROUGHOUT THE SITE AND PLACE EROSION CONTROL MEASURES SUCH AS SILT FENCE AND/OR FIBER ROLLS AS APPROPRIATE.

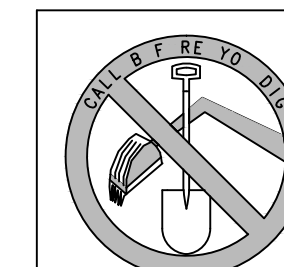
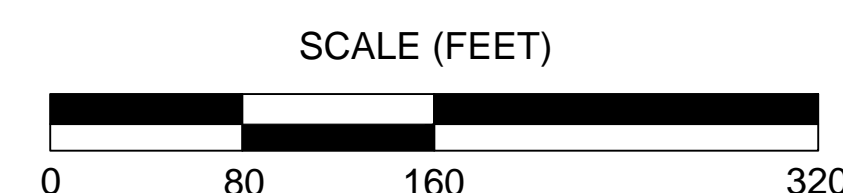
- 3 PROPOSED TEMPORARY STOCKPILE STAGING AREA FOR EXCAVATED ASH MATERIAL AWAITING TO BE TRANSPORTED TO WASTE MANAGEMENT FACILITY AT KETTLEMAN CITY, CALIFORNIA.
- 4 CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE / EXIT PER YOLO COUNTY DETAIL SHOWN ON SHEET 6.
- 6 DUMP TRUCK PARKING AND ACCESS ROUTE, IMPROVEMENTS SUCH AS BLADING, INSTALLING FABRIC, AND GRAVEL MAYBE REQUIRED TO KEEP ROADS FUNCTIONAL.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

LEGEND:

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXTENT OF ASH
- APPROXIMATE EXTENT OF ASH INCLUDING AREAS OF ASH 3" THICKNESS
- # 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE
- # 50' x 50' DECISION UNITS TO BE EXCAVATED AND TRANSPORTED OFF SITE FOR DISPOSAL AS NON-RCRA WASTE, WILL BE TREATED / STABILIZED ONSITE OR AT THE DISPOSAL FACILITY
- # 100' x 100' DIOXIN / FURAN CONTAINING DECISION UNITS ABOVE THE AGRICULTURAL CRITERIA
- LIMITS OF METAL DEBRIS REMOVAL AREA FOR SURFACE TO 10" DEPTH
- LIMITS OF METAL DEBRIS REMOVAL AREA TO 24" DEPTH



MATCHLINE - SEE SHEET 11



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|                           |      |
|---------------------------|------|
| PROJECT ENGINEER          |      |
| ERCAN CANDAN, P.E. C72067 | DATE |
| PROJECT MANAGER           |      |
| PRINT NAME:               | DATE |

|                      |      |
|----------------------|------|
| REVIEWED BY:         |      |
| for Agency / Utility | DATE |
| REVIEWED BY:         |      |
| for Agency / Utility | DATE |

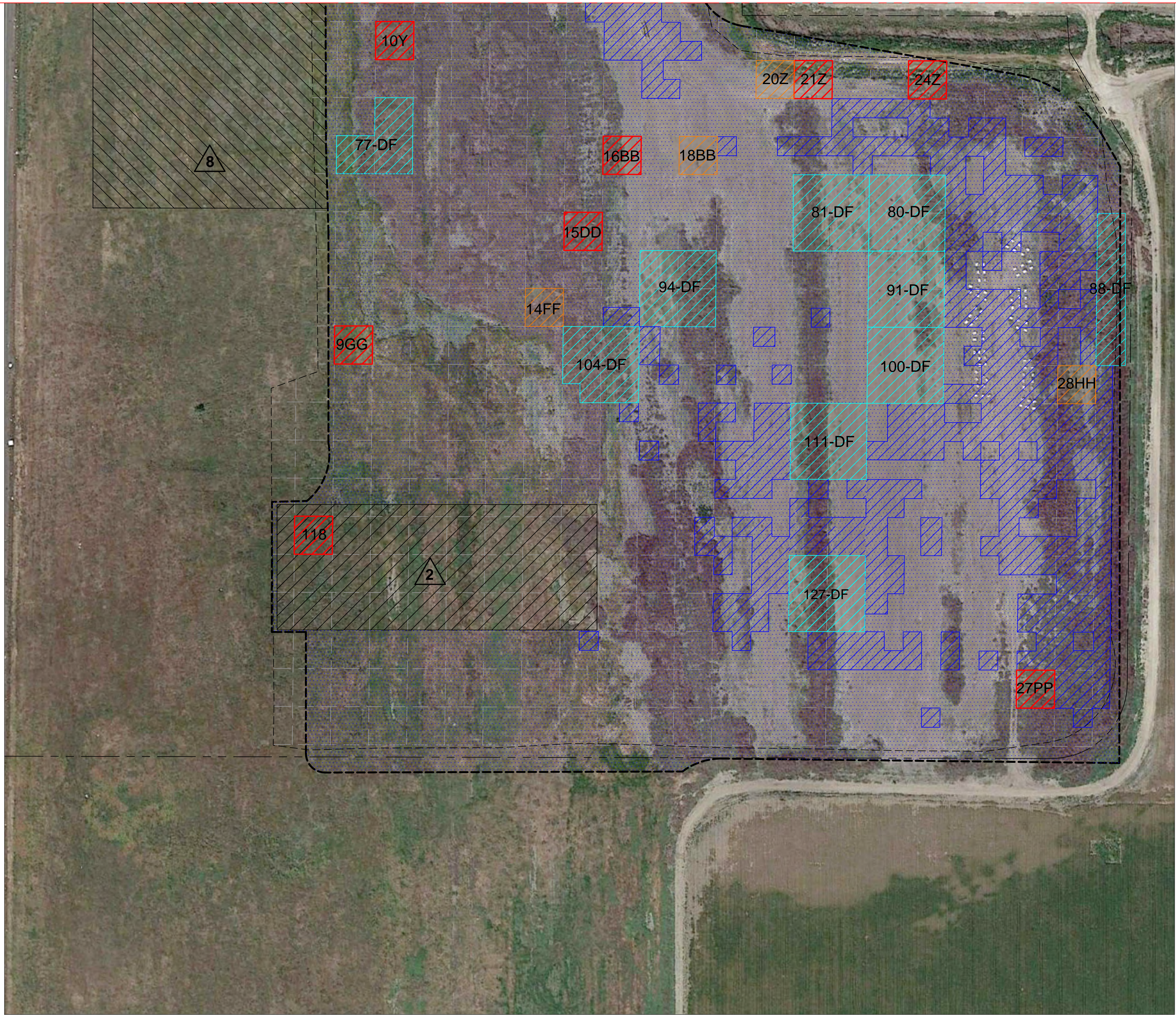
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LILLARD RANCH PROPERTY

GRADING PLAN-METALLIC DEBRIS REMOVAL

SHEET 10  
OF  
11 SHEETS



MATCHLINE - SEE SHEET 10



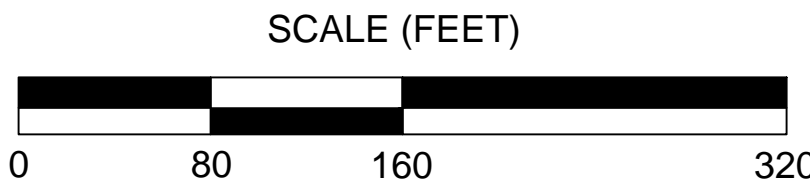
**NOTES:**

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- 2 ON-SITE STOCKPILE, MIXTURE OF SOIL AND ASH. THE HEIGHT OF THE STOCKPILE RANGES FROM 0.5 FEET TO 6.5 FEET. REFER TO SHEET 4 AND 5 FOR SPECIFIC AREAS OF EXCAVATION. THIS STOCKPILE WILL BE USED AS BACKFILL MATERIAL SOURCE TO BACKFILL DECISION UNITS SHOWN ON SHEET 4 AND 5.
- 8 ASH CONTAINING DIOXIN/FURAN ABOVE CRITERIA SPREADING/BLENDING AREA.

**LEGEND:**

- APPROXIMATE SITE BOUNDARY
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GRADING PLAN-METALLIC DEBRIS REMOVAL

SHEET 11  
OF  
11 SHEETS