

# STORMWATER POLLUTION PREVENTION PLAN

For

## Campus Paving and Drainage Project

**Legally Responsible Person (LRP):**

Garrett Higerd  
District Engineer

**Approved Signatory:**

Garrett Higerd  
District Engineer

**Project Address:**

1315 Meridian Blvd.  
Mammoth Lakes CA 93543

**SWPPP Preparation Date:**

6-3-2024

**Estimated Project Dates:**

Start of Construction: July 2024

Finish Construction: September 2024

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## **SECTION 1 SWPPP Requirements**

### **1.1 Introduction**

The Storm Water Pollution Prevention Plan (SWPPP) has been prepared for the Mammoth Community Water District's Wastewater Treatment Plant located at 1315 Meridian Blvd, Mammoth Lakes, Mono County, California, 93546. The project is overseen by the Mammoth Community Water District (MCWD), which acts as both the owner and the developer. Site and vicinity maps are referenced for precise location details.

This SWPPP is designed to comply with the requirements outlined in the July 2012 California Stormwater BMP Handbook, and the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. Compliance includes adherence to the State Water Resources Control Board (SWRCB) Order No. 2009-0009-DWQ. A copy of this General Permit is included in Appendix A of the SWPPP, as recommended by Section IV.G.1, which requires a copy of the General Permit to be kept on-site.

The primary objectives of the SWPPP, as specified in the General Permit (Section XIV.A), include:

1. Controlling all pollutants and their sources, including sediment from construction activities and site erosion.
2. Identifying and managing non-stormwater discharges that are not covered under a Regional Water Quality Control Board (RWQCB) permit.
3. Ensuring site BMPs are effective, achieving the Best Available Technology/Best Control Technology (BAT/BCT) standard to reduce or eliminate pollutants in stormwater and authorized non-stormwater discharges.
4. Ensuring calculations, design details, and BMP controls for site run-on are accurate and complete.
5. Installing stabilization BMPs to reduce or eliminate pollutants post-construction.

Additionally, the SWPPP aims to:

- Identify post-construction BMPs to be installed during construction to mitigate pollutants after project completion, as required by Section XIII.B. These BMPs should be planned early in the project and referenced in related reports or drawings.
- Provide methods for implementing BMP inspection, visual monitoring, the Rain Event Action Plan (REAP), and the Construction Site Monitoring Program (CSMP) in compliance with the General Permit.

## 1.2 Permit Registration Documents

The Permit Registration Documents (PRDs) for the Mammoth Community Water District's Wastewater Treatment Plant were submitted to the State Water Resources Control Board (SWRCB) through the Stormwater Multi Application and Report Tracking System (SMARTS). The submission was completed by the Legally Responsible Person (LRP), as required by the General Permit Sections I.D.36, II.B, and Attachment B.

To obtain coverage under the Construction General Permit, the project-related PRDs must be submitted via SMARTS. The project Waste Discharge Identification (WDID) confirmation is included in Appendix B of this SWPPP, in accordance with General Permit Section II.B.5, which mandates maintaining documentation of a valid WDID on demand.

The PRDs submitted and included in Appendix B are as follows:

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

This SWPPP has also been filed electronically as a PRD and submitted to the SWRCB.

### **1.3 SWPPP Availability and Implementation**

In accordance with the General Permit (Section XIV.C), the Storm Water Pollution Prevention Plan (SWPPP) will be available at the construction site during working hours while construction activities are ongoing. The SWPPP will be made accessible upon request by a State or Municipal inspector.

If the original SWPPP is retained by a crewmember in a construction vehicle and not present at the construction site, current copies of the Best Management Practices (BMPs) and the site map/drawing will be left with the field crew. The original SWPPP can be requested and made available via radio or telephone communication.

The SWPPP will be implemented concurrently with the commencement of ground-disturbing activities, ensuring that all required measures are in place to manage stormwater discharge and mitigate potential pollutants from the onset of the project.

### **1.4 SWPPP Amendments**

No amendments exist at this time. However, if any amendments are made, they will be directly attached to this SWPPP, signed by a Qualified SWPPP Developer (QSD), and dated accordingly. A log of these amendments will also be maintained in SWPPP Appendix C to ensure systematic documentation and compliance with the General Permit requirements (Sections XIV.A and VII.B.6).

### **1.5 Retention of Records**

The General Permit (Sections I.J.69 and IV.G) mandates that all dischargers maintain a paper or electronic copy of all required records for a minimum of three years from the date they are generated or submitted, whichever is later. These records must be available at the construction site until construction is completed.

To comply with this requirement, all relevant documents will be stored at the Mammoth Community Water District, located at 1315 Meridian Blvd, Mammoth Lakes, CA, 93546. The district will furnish the Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), or the US Environmental Protection Agency (EPA) with any requested information within a reasonable time frame to determine compliance with the General Permit.

RWQCBs may require records to be retained for longer periods. Therefore, all documentation will be diligently managed to ensure full compliance with these potential extended retention requirements.

## 1.6 Required Non-Compliance Reporting

The General Permit outlines several areas that require non-compliance reporting. It is the responsibility of MCWD to properly document and report any discharges or other violations of the General Permit. Exceedances and violations should be reported using the Stormwater Multi Application and Report Tracking System (SMARTS) and must include the following:

- Numeric Action Level (NAL) exceedances (NAL Exceedance Report upon request of the Regional Water Quality Control Board (RWQCB));
- Self-reporting of any other discharge violations or to comply with RWQCB enforcement actions; and
- Discharges containing a hazardous substance in excess of reportable quantities established in 40 CFR §§ 117.3 and 302.4, unless a separate National Pollutant Discharge Elimination System (NPDES) Permit has been issued to regulate those discharges.

In the event of an NAL exceedance, the subsequent site evaluation must be documented in the SWPPP (Section V.C.4). It is recommended that documentation of all reportable exceedances be included in the SWPPP. The results of an NAL exceedance site evaluation, along with other non-compliance events, should be included in SWPPP Appendix D.

## 1.7 Annual Report

The General Permit requires that all permittees prepare, certify, and electronically submit an Annual Report no later than September 1 of each year. Reporting requirements are identified in Section XVI of the General Permit and include (but are not limited to) providing a summary of:

- 1) Sampling and analysis results including laboratory reports, analytical methods and reporting limits and chain of custody forms (Risk Levels 2 and 3);
- 2) Corrective actions and compliance activities, including those not implemented;
- 3) Violations of the General Permit.
- 4) Date, time, place, and name(s) of the inspector(s) for all sampling, inspections, and field measurement activities;
- 5) Visual observation and sample collection exception records; and
- 6) Training documentation of all personnel responsible for General Permit compliance activities.

## 1.8 Changes to Permit Coverage

The General Permit (Section II.C) allows a permittee to reduce or increase the total acreage covered under the General Permit 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 sold to a different entity; or when new acreage is added to the project.

To change the acreage covered, the permittee must electronically file modifications to PRDs (revised NOI, site map, SWPPP revisions as appropriate, and certification that new landowners have been notified of applicable requirements to obtain permit coverage (including name, address, phone number, and e-mail address of new landowner) in accordance with requirements of the General Permit within 30 days of a reduction or increase in total disturbed

area. Include any updates to PRDs submitted via SMARTS in SWPPP Appendix E. *Document any related SWPPP revisions/amendments (Section II.C.2) in SWPPP Appendix C.*

## **1.9 Notice of Termination**

To terminate coverage under the General Permit, a Notice of Termination (NOT) must be submitted electronically via SMARTS. A “final site map” and photos are required to be submitted with the NOT. Filing a NOT certifies that all General Permit requirements have been met. The NOT is submitted when the construction project is complete and within 90 days of meeting all General Permit requirements for termination and final stabilization (Section II.D) including:

- The site will not pose any additional sediment discharge risk than it did prior to construction activity.
- All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.
- Post-construction stormwater management measures are installed and a long-term maintenance plan that is designed for a minimum of five years has been developed.

The NOT must demonstrate through photos, Revised Universal Soil Loss Equation (RUSLE) results, or results of testing and analysis that the project meets all of the requirements of Section II.D.1 of the General Permit by one of the following methods:

- 70% final cover method (no computational proof required); or
- RUSLE/RUSLE2 method (computational proof required); or
- Custom method (discharger demonstrates that site complies with final stabilization).

## **SECTION 2 Project Information**

### **2.1 Project and Site Description**

#### *Project Description*

The Mammoth Community Water District’s Campus Paving and Drainage project is located at 1315 Meridian Blvd, Mammoth Lakes, Mono County, California, 93546. The project involves full depth reclamation with pulverizing to a depth of 6 inches. The existing 3 inches will be reclaimed and used as subgrade for new Hot Mix Asphalt to be installed. The construction activities will disturb a total area of 182,700 Square Feet. Detailed references to applicable SWPPP drawings or construction plans are included to fulfill the General Permit site map requirements (General Permit Attachment B.J.2).

#### *Existing Site Conditions and Prior Land Use*

The project site currently features multiple drop inlets to direct all storm water from non-permeable surfaces to different percolation basins across the campus. The elevation of the project site is between 7682.32 Feet, and 7660 Feet, with drainage patterns leading to large stormwater

basins with a total approximate volume of 275,000 Cubic Feet. No major waterways are impacted by the campus stormwater runoff. All runoff finds its way to one of these basins.

*Soils and Geologic Conditions*

The project will be effecting previously disturbed soil, and the subgrade will be composed of pulverized asphalt, therefore no soils reports were conducted in anticipation of this project.

*Rainfall Patterns*

Mammoth Lakes, California experiences a Mediterranean climate characterized by dry summers and wet winters. The average monthly rainfall patterns for the period of July through October are as follows:

- **July & August:** These are the months with the lowest rainfall in Mammoth Lakes. On average, they receive close to zero inches of precipitation. Occasional thunderstorms may occur, but they are infrequent.
- **September:** September marks the beginning of a slight increase in rainfall compared to July and August. However, it remains a dry month with an average of approximately 0.25 inches of precipitation.
- **October:** October witnesses a more substantial increase in rainfall, signifying the transition towards the wetter season. The average precipitation for October falls within the range of 0.5 to 1 inch.

**2.2 Stormwater Run-On From Offsite Areas**

The project site topographically sits at a higher elevation than its surrounding stormwater runoff basins. Therefore there is no Run-On from offsite areas for this project.

**2.3 Findings of the Construction Site Sediment and Receiving**

Risk Type 2 and Risk Type 3. Project Type is based on the analytical results of two components: Sediment Risk and Receiving Water Risk. Sediment Risk calculations include analysis of project duration, location, and soil conditions. Receiving Water Risk is based on proximity to impaired receiving waters. Additionally, Linear Underground/Overhead Projects (LUPs) utilize a flow chart to determine either LUP Type 1 status or Receiving Water Risk. Risk Type determination documentation is included in Appendix B and summarized in the table(s) below:

RUSLE Factor	Value	Method for Establishing Value
R	1.35	US EPA, Construction Rainfall Erosivity Factor Calculator
K	0.24	SMARTS populated
LS	5.39	SMARTS populated

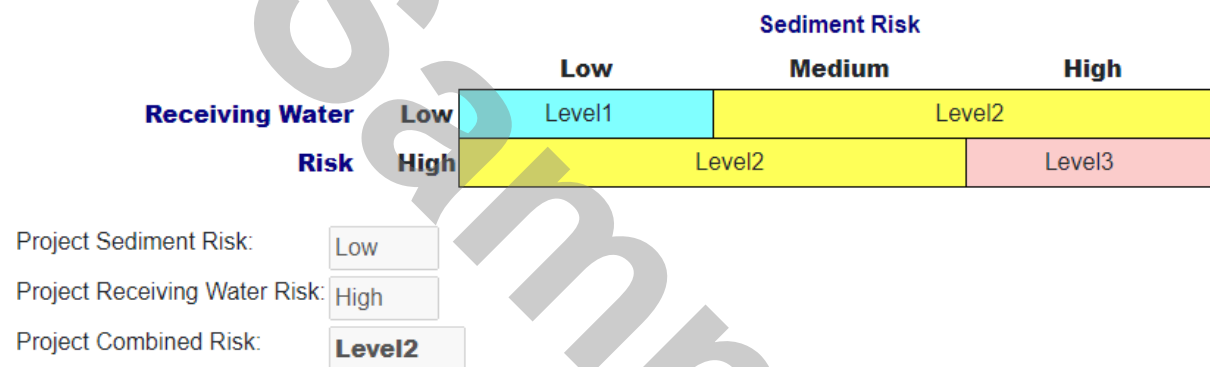


Watershed Erosion Estimate (tons/acre)	1.75	
Overall Sediment Risk	Low	Project Specific Assessment

Summary of Sediment Risk

Question	Answer
A.1.(a) Does the disturbed area discharge directly or indirectly to a 303(d) listed waterbody impaired by sediment? OR	No
A.1.(b) Is the disturbed area located within a sub-watershed draining to a 303(d) listed waterbody impaired by sediment? OR	Yes
A.2. Is the disturbed area located within a planning watershed draining to a waterbody with designated beneficial uses of COLD, SPAWN AND MIGRATORY?	No
<b>Overall Receiving Water Risk</b>	<b>HIGH</b>

Summary of Receiving Water Risk



Project Combined Risk Summary

## 2.4 Construction Schedule

**Estimated Project Dates:** July 2024 - October 2024 (inclusive)

**Note:** This schedule is an estimate and subject to change. Any modifications or extensions to the construction timeframe may require reevaluation of the site sediment risk and potentially impact permit requirements. In the event of schedule changes, project personnel must contact the Qualified Storm Water Discharge (QSD) Inspector for guidance.

## 2.5 Potential Construction Site Pollutant Sources

This section identifies potential construction materials and activities that have the potential to contribute pollutants, including sediment, to stormwater runoff. The following list is required by the General Permit (Attachments C, D, & E - Section B.5) to develop Best Management Practices (BMPs) that minimize or prevent these pollutants from entering stormwater discharges.

### 1. Sediment:

- Construction activities such as full-depth reclamation, grading, and stockpiling of soil and aggregate are the primary sources of sediment generation. Uncontrolled sediment can significantly impact water quality in nearby streams and rivers.

### 2. *Construction Equipment Fluids:*

- Leaks or spills from equipment used for reclamation, paving, and other construction activities can introduce pollutants like:
  - Oil
  - Hydraulic fluid
  - Coolant

### 3. *Asphalt Materials:*

- Asphalt binder and tack coat contain solvents that can contribute to stormwater pollution if not managed properly.

### 4. *Concrete Curing Compounds:*

- Some concrete curing compounds, used if minor concrete work is involved, may contain volatile organic compounds (VOCs) that can evaporate and enter stormwater runoff.

### 5. *Dust from Stockpiles:*

- Stockpiles of soil, aggregate, or other materials can generate dust particles that get carried away by stormwater runoff.

### 6. *Sanitary Waste:*

- Improper management of sanitary waste from construction crews can introduce harmful bacteria and other contaminants into stormwater.

### 7. *Construction Waste:*

- Construction and demolition debris can leach pollutants into stormwater if not properly contained.

## **2.6 Identification of Non-Stormwater Discharges**

The General Permit requires the identification of all non-stormwater discharges generated at the construction site. These discharges, if not eliminated, must be controlled or treated to prevent pollutants from entering stormwater runoff. Here's a breakdown of potential non-stormwater discharges relevant to this project:

- *Construction Site Dewatering:* Discharges from trench dewatering, foundation drainage, or other water removal activities associated with construction.

- *Equipment Washwater:* Washwater from cleaning construction equipment, tools, and vehicles. Note: Washing with biodegradable detergents in designated wash areas can potentially be allowed under specific permit conditions. However, confirmation requires consultation with local regulations.
- *Sanitary Wastewater:* Discharges from toilets or other sanitary facilities used by construction workers. These discharges must be directed to a sanitary sewer system or properly permitted portable sanitary facilities.
- *Discharges from Concrete Washout:* Leftover concrete, concrete truck rinsate, and washwater from concrete equipment should not be discharged onto the ground or into storm drains. Designated concrete washout facilities should be used to capture and solidify these materials.

## **SECTION 3 Best Management Practices**

### **3.1 Schedule for BMP Implementation**

BMPs must be implemented, modified, and maintained to reflect the phase of construction and the weather conditions. To be effective, some BMPs must be installed before the site is disturbed and others may require multiple applications or installations. The following BMP and A-ESCP selection tables indicate the BMPs that should be implemented on the construction site; alternate methods may be implemented if effective and approved by the QSD. Fact Sheets/Cut Sheets for BMPs which describe the purpose, application, limitations, implementation, inspection, and maintenance are provided in Appendix H. The QSD shall be contacted in the event of a conflict between the SWPPP, the Site Map(s), Fact Sheets or other documents.

#### **3.2.1 Erosion and Sediment Control**

Erosion control, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Erosion control BMPs protect the soil surface by covering, binding soil particles, and/or strengthening the subsurface. This construction project will implement the following practices to provide effective temporary and/or final erosion control during construction:

1. Control of area of soil disturbing operations shall be such that the Contractor is able to implement erosion control BMPs quickly and effectively.
2. Provide effective soil cover for inactive areas. Inactive is defined as areas of construction activity that have been disturbed and are not scheduled to be redisturbed for at least 14 days.
3. Implement BMPs to prevent the off-site tracking of loose construction materials.
4. Control erosion in concentrated flow paths by applying erosion control blankets, or alternate effective methods.
5. Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist.

<b>BMP Name</b>	<b>Description</b>	<b>Project Specific Notes/Instructions</b>
EC-1	Scheduling	Limit soil disturbance activities and pollutant use during periods of precipitation to the entire project duration.
WE-1	Wind Erosion Control	Cover inactive stockpiles and trash receptacles to prevent windblown dust and debris.

### 3.2.2 Sediment Controls

Sediment controls are measures that are intended to complement the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are typically temporary but permanent measures also exist. Sediment controls are designed to intercept, filter, and/or settle out soil particles that have been detached and are transported by the force of water. This construction project will implement the following practices to provide effective sediment control during construction:

1. Establish and maintain effective perimeter controls.
2. Stabilize all construction entrances and exits and ensure that construction traffic to and from the project is limited to the entrances and exits.
3. Ensure that all storm drain inlets and perimeter controls, runoff controls, and pollutant controls are maintained and effective.

<b>BMP Name</b>	<b>Description</b>	<b>Project Specific Notes/Instructions</b>
SE-5	Fiber Rolls	Place along the downgradient perimeter of stockpiles and upslope of pole locations before soil disturbance to intercept and trap sediment.
TC-1	Stabilized Construction Entrance/Exit	Construct a stabilized area at the entrance to the facility

### 3.3 Non-Stormwater and Materials Management

3.3.1 Non-Stormwater Controls Non-stormwater discharges into storm drain systems or waterways, which are not authorized, are prohibited. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in Appendix D. This construction project will implement the following practices to provide effective non-stormwater management during construction:

1. Prevent oil, grease, or fuel to leak into the ground, storm drains, or surface waters. Clean leaks immediately and dispose of leaked materials properly.
2. Place all equipment or vehicles which are to be fueled, maintained, and stored in a designated area, fitted with appropriate BMPs.

3. Clean streets in such a manner as to prevent unauthorized non-storm water discharges. 4. Wash vehicles (if necessary) in such a manner as to prevent non-stormwater discharges.

#### 4 Post-Construction Stormwater Management Measures.

<b>BMP Name</b>	<b>Description</b>	<b>Project Specific Notes/Instructions</b>
NS-1	Water Conservation Practices	Implement water conservation practices throughout the project duration to minimize water use.
NS-6	Illicit Connection/Discharge	If an illicit connection or discharge is discovered, immediately contact the QSP or EFS to report the issue and take corrective actions.
NS-8	Vehicle and Equipment Cleaning	Limit vehicle and equipment cleaning activities to designated off-site locations with proper wastewater disposal procedures.
NS-9	Vehicle and Equipment Fueling	Implement secondary containment measures and maintain a spill kit readily available during vehicle and equipment fueling activities.
NS-10	Vehicle and Equipment Maintenance	Maintain a spill kit readily available during vehicle and equipment maintenance activities.
NS-12	Concrete Curing (Minimal or no concrete use)	(Note: Adapt based on actual concrete use) If concrete work occurs, implement secondary containment for storage of concrete curing chemicals.
NS-13	Concrete Finishing (Minimal or no concrete use)	(Note: Adapt based on actual concrete use) If concrete work occurs, implement secondary containment for storage of concrete finishing chemicals.

### 3.3.2 Material Management and Waste Management Material

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 stormwater discharges.

Waste management consists of implementing procedural and structural BMPs for handling, storing, and ensuring proper disposal of waste to prevent the release of those wastes into stormwater discharges. If applicable to the project site, waste management should be conducted in accordance with the Project's Construction Waste Management Plan.

Material and waste management pollution control BMPs shall be implemented to minimize stormwater contact with construction material, waste, and service areas; and to prevent materials and waste from being discharged off-site. This construction project will implement the following practices to provide effective waste and materials management during construction:

1. Inventory products.
2. Cover and berm loose stockpiled construction materials that are not actively being used. Contain and securely protect stockpiled waste material from wind and rain all times unless actively being used. Contain stockpiled landscape materials such as mulches and topsoil when they are not actively being used.
3. Store chemicals in watertight containers in appropriate secondary containment to prevent any spillage or leakage or in a completely enclosed storage shed.

4. Minimize exposure of construction material to precipitation.
5. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so that there is no discharge into the underlying soil and onto surrounding areas.
6. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surface or into the storm drain system.
7. Ensure the containment of sanitation facilities, clean or replace regularly, and inspect for leaks and spills.
8. Cover waste disposal containers at the end of every business day and during a rain event. Prevent discharges from waste disposal containers.
9. Control the air deposition of site materials and from site operations.

<b>BMP Name</b>	<b>Description</b>	<b>Project Specific Notes/Instructions</b>
WM-1	Material Delivery and Storage	Implement measures to ensure proper delivery, handling, and storage of construction materials throughout the project.
WM-2	Material Use	Minimize material waste through careful planning, cutting, and ordering practices.
WM-3	Stockpile Management	Implement proper management practices for all stockpiles of soil, aggregate, or other materials.
WM-4	Spill Prevention and Control	Develop and implement a Spill Prevention and Control Plan (SPCC) to address potential spills or leaks of hazardous materials.
WM-5	Solid Waste Management	Establish a comprehensive solid waste management plan to minimize waste generation and ensure proper disposal.
WM-6	Hazardous Waste Management	Identify, manage, and dispose of hazardous wastes (e.g., used oil, solvents, paints) in accordance with applicable regulations.
WM-7	Contaminated Soil Management	Develop a plan for the identification, handling, and disposal of any contaminated soil encountered during construction activities.
WM-8	Concrete Waste Management (Minimal or no concrete use)	(Note: Adapt based on actual concrete use) If concrete work occurs, implement measures to minimize concrete waste and ensure proper disposal of any concrete residuals.
WM-9	Sanitary-Septic Waste Management	Provide and maintain adequate sanitary facilities (e.g., portable toilets) in the staging area for construction workers.

### 3.3.3 Spill Response and Implementation

Prevention and control of spills minimizes or eliminates the discharge of hazardous and nonhazardous material and waste to the storm drain system or surface waters. All material storage and handling should be located away from natural water courses and storm drains, and should be stored in areas not susceptible to rain if possible. Employees, contractors, subcontractors, and any other site personnel shall use Good Housekeeping practices at all times and implement other containment controls as a secondary line of defense. Personnel handling any hazardous materials shall be knowledgeable about such materials and shall take proper steps

in notifying the Engineer. This construction project will implement the following practices to provide effective spill prevention and management during construction:

1. Equipment and materials for cleanup of spills shall be available on site.
2. Spills and leaks shall be cleaned up immediately and disposed properly.
3. Appropriate spill response personnel are to be assigned and trained.
4. If a spill occurs, document all steps taken and submit a written report to the Engineer.

### **3.4 Post Construction Stormwater Management Measures**

Post construction BMPs are permanent measures designed to reduce or eliminate pollutant discharges from the site after construction is complete and are installed during construction. Due to the topography and nature of the project, Housekeeping will be the only Post Construction Measure to be implemented.

## **SECTION 4: BMP Inspection, Maintenance, and Rain Event Action Plans**

### **4.1 BMP Inspection and Maintenance**

- **Inspection Requirements:**
  - All BMPs will be inspected on a weekly basis and daily during rain events (minimum requirement). Some BMPs, like tracking controls, may require daily monitoring.
  - Inspections will be conducted by a Qualified Stormwater Pollution Prevention Plan (SWPPP) Practitioner (QSP) or trained personnel under their supervision.
  - Blank and completed inspection checklists will be included in SWPPP Appendix I. Completed checklists will be maintained on-site with the SWPPP or in an accompanying file readily accessible on-site.

#### **Inspection Checklist:**

- The SWPPP Appendix I will include a blank inspection checklist that captures the following information for each inspection:
  - Date of inspection
  - Weather information
  - Site information
  - Observations of each inspected BMP
  - Any deficiencies noted in BMP functionality.
  - Corrective actions taken (repairs, additional BMPs)
  - Inspector name, title, and signature

### **Maintenance Procedures:**

- BMPs will be maintained regularly based on inspection findings and routine construction activities.
- Corrective actions for identified deficiencies will be implemented within 72 hours of inspection.
- SWPPP amendments will be prepared by the QSP if warranted by the problem encountered and corrective action required.

## **4.2 Rain Event Action Plans (REAPs)**

### **REAP Requirements:**

- Site-specific REAP templates will be developed for each applicable phase of the project and included in SWPPP Appendix J. Completed REAPs will be maintained on-site with the SWPPP or in an accompanying file.
- The QSP will develop a REAP 48 hours before any predicted rain event with a 50% or greater chance of precipitation in the project area.
- The REAP will be implemented 24 hours before the predicted rain event.

### **REAP Content:**

The REAP will include the following minimum site and phase-specific information:

- Site Address
- Calculated Risk Level (2)
- Site Stormwater Manager Information (name, company, 24-hour emergency phone number)
- Activities associated with construction.
- Trades active on the site during construction.
- Trade contractor information
- Suggested actions.

## **SECTION 5 Training**

All persons responsible for implementing requirements of the 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. To promote stormwater management awareness specific for this project, periodic training of job-site personnel should be included as part of routine project meetings (e.g. daily/weekly tailgate safety meetings), or task specific trainings as needed. The QSP and Contractor can provide stormwater training information at the meetings, and subsequently complete a training log as provided in Appendix E. MCWD's stormwater training expectations include the following:



- The QSP provide a SWPPP training session to site personnel at the start of the project.
- All site personnel attend a site orientation that includes storm water pollution prevention topics specific to the site.

The QSD may delegate activities to personnel trained to do the task(s) appropriately but shall ensure adequate performance. The QSD is responsible for ensuring that all persons working on construction related activities on-site have SWPPP training. A copy of the training record sign in sheet is filed with the on-site SWPPP immediately after the training. In cases where the initial training does not reach all members of the crew, the QSD must ensure additional training is provided. Additional training may be delegated; however, the initial training must be conducted by the QSD. The QSD is also expected to be available to train and assist those individuals conducting daily inspections. The primary and secondary daily unrecorded inspectors must be trained at the same time to ensure that the secondary contact is able to immediately step in, should the primary contact be unavailable. Site specific training requirements will include:

- Erosion Control
- Sediment Control
- Non-Storm Water Control
- Waste Management and Material Pollution Control Retain formal and informal training documentation, including copies of QSD and QSD certificates for designated personnel, in Appendix I.

## SECTION 6 Responsible Parties and Operators

- **Legally Responsible Person (LRP):** Garrett Higerd, District Engineer, Mammoth Community Water District. [ghigard@mcwd.dst.ca.us](mailto:ghigard@mcwd.dst.ca.us).
- **Qualified SWPPP Practitioner (QSD):** Garrett Higerd, District Engineer, Mammoth Community Water District. [ghigard@mcwd.dst.ca.us](mailto:ghigard@mcwd.dst.ca.us).
- **Project Manager:** Nolan Ferguson, Staff Engineer, Mammoth Community Water District. [nferguson@mcwd.dst.ca.us](mailto:nferguson@mcwd.dst.ca.us)

### Contractor and Subcontractors

All contractors, subcontractors, and individuals who will be directed by the QSP shall be listed in Appendix F. Contractor and Subcontractor information shall include telephone numbers, work addresses, areas of responsibility, and emergency contact numbers. The list shall be updated as contractors, subcontractors, and individuals change.

## SECTION 7 Construction Site Monitoring Program

### 7.1 Purpose

This Construction Site Monitoring Program (CSMP) is developed to comply with the California State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges from Construction Activities (General Permit). This site-specific CSMP outlines the monitoring procedures for the MCWD Paving Project (the Project). The CSMP will be included as Appendix N of the project's Storm Water Pollution Prevention Plan (SWPPP). The CSMP will be revised as necessary to reflect any project modifications.

### 7.2 Applicability of Permit Requirements

The General Permit outlines monitoring requirements for stormwater and non-stormwater discharges from construction sites. These requirements vary depending on the project's risk level. Since this project is classified as Risk Level 2, the following monitoring requirements apply:

- **Visual Observations:** Weekly inspections of all BMPs and site conditions, with daily inspections during qualifying storm events.
- **Stormwater Sample Collection:** Collection of stormwater runoff samples during qualifying storm events. Samples will be analyzed for pH and turbidity.
- **Non-Stormwater Sample Collection:** Collection of non-stormwater discharge samples (authorized and unauthorized) to characterize the discharge.
- **Sample Collection During BMP Failure:** Collection of runoff samples and samples from an unaffected area in the event of a BMP failure, breach, or spill.

**Qualifying Storm Event:** A qualifying storm event is defined as a storm event that produces measurable precipitation (0.1 inch or greater) following a minimum 72-hour dry period.

### 7.3 Monitoring Locations

Maps and descriptions of all monitoring locations will be included in this section. These locations will include:

- **BMP Locations:** The CSMP will include a map and table identifying the specific locations of all implemented BMPs on the project site. For paving projects, typical BMPs may include sediment traps, inlet protection, stabilized construction entrances/exits, and dust control measures.
- **Stormwater Discharge Locations:** The CSMP will include a map and table identifying all potential discharge locations for stormwater runoff from the paved areas and disturbed soils.
- **Non-Stormwater Discharge Locations:** The CSMP will include a map and table identifying all potential discharge locations for authorized and unauthorized non-stormwater discharges from the project site. This may include dewatering activities, washout of equipment or concrete trucks, or sanitary wastewater.

- **Sample Collection Locations:** The CSMP will include a map and table identifying all locations where stormwater and non-stormwater discharge samples will be collected. These may include locations at BMP outlets, discharge points, and upstream/downstream of potential pollutant sources.

## 7.4 Safety

Safety is a top priority during all monitoring activities. The CSMP will include a site safety plan that outlines potential hazards associated with conducting visual observations and sample collection, particularly during inclement weather. Personnel conducting monitoring activities will be trained on the site safety plan and proper personal protective equipment (PPE) requirements.

## 7.5 Visual Monitoring (Inspections)

### Inspection Frequency:

- **BMP Inspections:** Weekly inspections of all BMPs will be conducted. Daily inspections will be conducted during qualifying storm events.
- **Site Inspections:** Weekly inspections of the entire project site will be conducted to identify potential sources of erosion or sediment transport, unauthorized non-stormwater discharges, and any issues that may affect BMP performance. Particular attention should be paid to areas where paving is incomplete or disturbed soils are exposed.

### Inspection Checklists:

Blank and completed inspection checklists will be included in Appendix O of the SWPPP. The checklists will include the following information for each inspection:

- Date and time of inspection
- Inspector name and qualifications
- Weather conditions
- Observations of each BMP, including functionality and any deficiencies
- Observations of site conditions, including stockpiles of soil or paving materials, exposed soils, dust control measures, and unauthorized non-stormwater discharges
- Corrective actions taken to address any identified deficiencies

## 7.6 Water Quality Sampling and Analysis (continued from previous section)

### Sample Collection Procedures:

- All samples will be collected using clean sampling techniques to avoid contamination.
- Sample containers will be properly labeled with the project name, date, time, location, and sample type.
- Chain-of-custody procedures will be followed to ensure proper documentation of sample collection, handling, and transport to the laboratory.

## **Laboratory Analysis:**

- A qualified laboratory certified by the State of California will be used for all sample analyses.
- All laboratory reports will be maintained with the SWPPP documentation.

## **7.7 Watershed Monitoring Option (Not Applicable)**

This section is not applicable for this project as we are not participating in a regional watershed-based monitoring program.

## **7.8 Quality Assurance and Quality Control (QA/QC)**

In addition to the sample collection procedures outlined in Section 7.6, the following QA/QC measures will be implemented to ensure the accuracy and representativeness of collected samples:

- **Field Blanks:** Field blanks will be collected during each sampling event to identify potential contamination from sample collection procedures. Field blanks consist of laboratory-grade deionized water transported to the site and processed identically to environmental samples.
- **Equipment Calibration:** All field measurement instruments (e.g., pH meters) will be calibrated according to the manufacturer's specifications and documented. Calibration records will be maintained with the SWPPP documentation.
- **Duplicate Samples:** Duplicate samples will be collected at a frequency of 10% during each sampling event to assess precision in sample collection and laboratory analysis. Duplicate samples are collected from the same location and time as the original sample using identical procedures.

## **7.9 Reporting Requirements and Records Retention**

### **7.9.1 Documentation**

The following information will be documented on standardized checklists and field forms during observations and sample collection:

- Date and time of inspection/sampling
- Inspector/sampler name and qualifications
- Weather conditions
- Description of each BMP inspected or sampling location
- Observations of site conditions or sample characteristics (e.g., color, clarity)

- Field measurements (e.g., pH)
- Sample identification code
- Any corrective actions taken

### **7.9.2 Records Retention**

All monitoring records, including inspection checklists, field data sheets, laboratory reports, and chain-of-custody documents, will be maintained for a minimum of three years following the completion of the project. These records will be available for review by authorized regulatory personnel upon request.

### **7.9.3 Reporting**

- **Annual Report:** An annual report summarizing the monitoring activities conducted during the previous year will be submitted to the appropriate Regional Water Quality Control Board (RWQCB) by the deadline specified in the General Permit.
- **Stormwater Reports:** SMARTS electronic reporting system will be used to report qualifying storm events and any exceedances of Numeric Action Levels (NALs) as required by the General Permit.

**Note:** Specific details regarding NALs and their reporting requirements can be found in Appendix D of the handbook referenced in the original text you provided. You may need to consult that document for this section or reference it for further guidance.

# **Appendix A**

## **Projects Plans and Site Maps**

Sample

# Appendix B

## Applicable Permit Registration Documents (PRDs)

NOI  
Application ID  
Risk Determination

Sample

Permit Type: Traditional:Construction - NOI Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

**Enter the Owner Contact Information**

Populate contact information from linked user:

Owner Name: \*

Street Address: \*

Address Line 2:

City/State/Zip: \*

Type: \*  [Definitions](#)

Federal Tax ID:

Contact First Name: \*

Contact Last Name: \*

Title:

Phone:  Ext:  (999-999-9999)

E-mail: \*  (abc@xyz.com)

[Save & Continue](#) Fields marked with \* are mandatory fields.

Permit Type: Traditional:Construction - NOI Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification

**Enter the on-site contact person. This is the person present on-site that oversees day to day construction activities**

Select the contact from the drop box or enter the contact information into the fields:

Company Name: \*

Street Address: \*

Address Line 2:

City/State/Zip: \*

Contact First Name: \*

Contact Last Name: \*

Title:

Phone: \*  Ext:  (999-999-9999)

Email: \*  (abc@xyz.com)

[Save & Continue](#) Fields marked with \* are mandatory fields.



Permit Type: Traditional:Construction - NOI

Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

**Enter the Site Information**

Site Name: \*

Street Address: \*

Address Line 2:

City/State/Zip: \*  CA

Latitude: \*

Longitude: \*  [Lookup Map](#)

Total Site Size: \*  Acres

Total Planned Disturbed Acreage \*  Acres

Disturbed Area Remaining \*  Acres

Tract Number(s):

Mile Post Marker:

Construction Start Date: \*  (mm/dd/yyyy)

Complete Grading Date:  (mm/dd/yyyy)

Final Stabilization Date: \*  (mm/dd/yyyy)

Is the site a part of a larger common plan of development?

Yes  No

Name of the Common Plan of Development:

What is the Total Site Size of the Common Plan of Development?

Type of Construction:  Traditional  Linear

Residential  Commercial  Industrial  Reconstruction  Transportation  Other:

Permit Type: Traditional:Construction - NOI

Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

**Enter Additional Site Information**

County: \*

Regional Board: \*

Regional Water Board email: \*

Name of receiving water (river, lake, creek, stream, bay, ocean):

If applicable, has the local agency reviewed/approved a required erosion/sediment control plan?  Yes  No

Does the erosion/sediment control plan address construction activities such as infrastructure and structures?  Yes  No

Is the project or any part thereof subject to conditions imposed under a Clean Water Act Section 401 or 404 Water Quality Certification (Y/N)?  Yes  No

If yes, provide details:

Dewatering - Are there any dewatering activities occurring on site in accordance with Attachment J that are not covered under a separate NPDES dewatering permit?  Yes  No

Active Treatment System - Will active treatment systems be utilized on site in accordance with Attachment F?  Yes  No

Passive Treatment Technologies - Will passive treatment technologies be utilized on site in accordance with Attachment G?  Yes  No

Areas of Special Biological Significance - Is this project granted an exception to the California Ocean Plan provisions prohibiting construction and non-stormwater discharges to areas of special biological significance in accordance with Attachment I?  Yes  No

Permit Type: Traditional:Construction - NOI

Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk**
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

- Sediment Risk**
- Receiving Water Risk
- Combined Risk

### 1. SEDIMENT RISK FACTOR CALCULATION

Instructions: Enter R, K, and LS factor values. System will calculate watershed erosion estimates and segment sediment risk factor.

A) R Factor Value: **\*(What's this?)\***  [Erosivity Calculator Help](#)

[Populate K and LS using GIS layer data](#)

B) K Factor Value: (weighted average, by area, for all site soils) **\*(What's this?)\***

C) LS Factor: (weighted average, by area, for all slopes) **\*(What's this?)\***

Watershed Erosion Estimate (=R\*K\*LS) in tons/acre

Project Sediment Risk Factor: **(What's this?)\***

[Save & Continue](#)

Fields marked with \* are mandatory fields.

Permit Type: Traditional:Construction - NOI

Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk**
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

- Sediment Risk
- Receiving Water Risk**
- Combined Risk

### 2. RECEIVING WATER RISK FACTOR CALCULATION

[Statewide Map of High Receiving Water Risk Watersheds](#)

#### A. Watershed Characteristics

A.1.(a) Does the disturbed area discharge directly or indirectly to a 303(d) listed waterbody impaired by sediment?  
[OR](#)

A.1.(b) Is the disturbed area located within a sub-watershed draining to a 303(d) listed waterbody impaired by sediment?  
[OR](#)

A.2. Is the disturbed area located within a planning watershed draining to a waterbody with designated beneficial uses of COLD, SPAWN AND MIGRATORY?

Receiving Water Risk (answer to above questions):  [Populate Receiving Water Risk](#)

Project Receiving Water Risk Factor:

[Save & Continue](#)

Fields marked with \* are mandatory fields.

Permit Type: Traditional:Construction - NOI

Application ID: 572932

Status: Not Submitted

- Owner Information
- On-Site Contact Information
- Site Information
- Additional Site Information
- Risk**
- TMDL
- Post Construction
- QSD Information
- Attachments
- Billing Information
- Certification
- Linked Users

- Sediment Risk
- Receiving Water Risk
- Combined Risk**

### 3. COMBINED RISK LEVEL MATRIX

		Sediment Risk		
		Low	Medium	High
Receiving Water Risk	Low	Level1	Level2	
	High	Level2		Level3

Project Sediment Risk:

Project Receiving Water Risk:

Project Combined Risk:

[Continue](#)

Fields marked with \* are mandatory fields.

# Appendix C

## **Amendment Certifications**

Sample



## Amendment Certification

General Information	
Project/Site Name:	MCWD Campus and Wastewater Treatment Plant
Project Location:	1315 Meridian Blvd. Mammoth Lakes CA
Amendment Number:	

QSD Certification of the SWPPP Amendment
<p>By signing below, the QSD certifies the following statement, "I certify under penalty of law that this amendment 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." Additionally, the QSD certifies that, "I am a Qualified SWPPP Developer in good standing as of the date signed below."</p>

_____	_____
QSD Signature	Date
_____	_____
QSD Name	QSD Certification Number
_____	_____
Title and Affiliation	Telephone Number
_____	_____
Address	Email Address

# Appendix D

**Submitted Changes to PRDs**

---

### Log of Updated PRDs

The General Permit allows for the reduction or increase of the total acreage covered under the General Permit 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.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in permit covered acreage is to be sought. The SWPPP shall be modified appropriately, with revisions and amendments recorded in **Appendix C**. Updated PRDs submitted electronically via SMARTS can be found in this Appendix.

---

This appendix includes all of the following updated PRDs (check all that apply):

- Revised Notice of Intent (NOI);
- Revised Site Map;
- Revised Risk Assessment;
- New landowner's information (name, address, phone number, email address); and
- New signed certification statement.

---

Legally Responsible Person

---

Signature of Legally Responsible Person  
or Approved Signatory

---

Date

---

Name of Legally Responsible Person  
or Approved Signatory

---

Telephone Number

---

# Appendix E

## Construction Schedule

Sample

Anticipated Project Start Date: July 21, 2024

Duration: 30 Working Days

### Construction Schedule

Week 1 (July 21 - July 27)

Mobilization and Setup (1 day - July 21)

Pulverizing Existing Asphalt (4 days - July 22 to July 25)

Site Cleanup and Preparation for Grading (1 day - July 26)

Week 2 (July 28 - August 3)

Grading (3 days - July 28 to July 30)

Initial Inspection and Adjustments (1 day - July 31)

Recompacting (2 days - August 1 to August 2)

Week 3 (August 4 - August 10)

Final Grading and Compaction Adjustments (2 days - August 4 to August 5)

Preparation for Asphalt Installation (1 day - August 6)

Hot Mix Asphalt Installation (First Layer) (2 days - August 7 to August 8)

Curing and Initial Inspection (1 day - August 9)

Week 4 (August 11 - August 17)

Hot Mix Asphalt Installation (Second Layer) (2 days - August 11 to August 12)

Final Surface Finishing (1 day - August 13)

Final Inspection and Quality Assurance (2 days - August 14 to August 15)

Week 5 (August 18 - August 24)

Punch List and Corrections (2 days - August 18 to August 19)

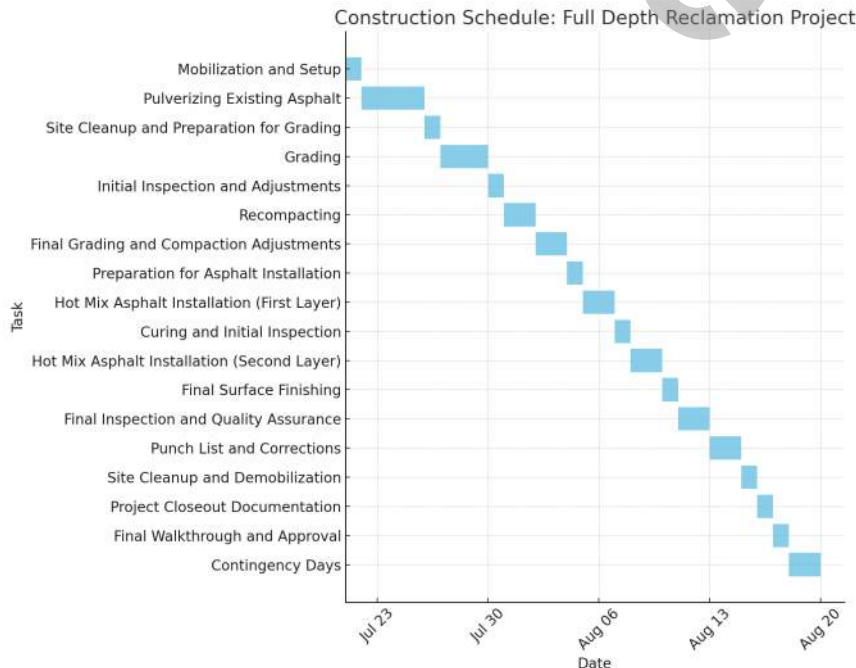
Site Cleanup and Demobilization (1 day - August 20)

Project Closeout Documentation (1 day - August 21)

Week 6 (August 25 - August 27)

Final Walkthrough and Approval (1 day - August 25)

Contingency Days (2 days - August 26 to August 27)





Sample

# Appendix F

CONSTRUCTION ACTIVITIES, MATERIALS USED AND ASSOCIATED POLLUTANTS

**Table F.1 POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

General Work Activity/Products With Potential Stormwater Pollutants	Specific Work Activity/Products With Potential Stormwater Pollutants	Pollutant Categories
Adhesives	PVC cement	Oil and Grease
Asphalt paving/curbs	Hot mix asphalt	Oil and Grease
Concrete / Masonry	Cement and brick dust; Concrete curing compounds;	Metals, Synthetic Organics
Liquid waste	Wash waters	Metals, Synthetic Organics
Painting	stripping pigments and sanding	Metals, Synthetic Organics
Removal of existing structures	Demolition of asphalt, concrete, masonry	Metals, Oil and Grease, Synthetic Organics
Sanitary waste	Portable toilets; Disturbance of existing sewer lines.	Nutrients
Solid waste	Litter, trash and debris	Gross Pollutants
Vehicle and equipment use	Equipment operation; Equipment maintenance; Equipment washing; Equipment fueling	Oil and Grease

**Table F.2 CONSTRUCTION ACTIVITY AND ASSOCIATED POLLUTANTS**

Phase	Activity	Associated Materials or Pollutants	Pollutant Category(1)
Demolition & Pulverization Phase	Demolish Block Stem Wall	Demolition of asphalt, concrete, masonry	Metals, Oil and Grease, Synthetic Organics
	Demolish Concrete Drop Inlets	Demolition of asphalt, concrete, masonry	Metals, Oil and Grease, Synthetic Organics
	Pulverize Existing Asphalt	Hot Mix Asphalt	Oil and Grease
New Facilities and Grading Phase	Install New Concrete	Cement and brick dust; Concrete curing compounds;	Metals, Synthetic Organics
	Install new Drain Pipes	PVC cement	Oil and Grease
	Vehicle and equipment use	Equipment operation; Equipment maintenance; Equipment washing; Equipment fueling	Oil and Grease
New HMA Phase	Vehicle and equipment use	Equipment operation; Equipment maintenance; Equipment washing; Equipment fueling	Oil and Grease
	Asphalt paving/curbs	Hot mix asphalt	Oil and Grease
	Sanitary waste	Portable toilets; Disturbance of existing sewer lines.	Nutrients
Striping and Cleanup	Painting	stripping pigments and sanding	Metals, Synthetic Organics
	Vehicle and equipment use	Equipment operation; Equipment maintenance; Equipment washing; Equipment fueling	Oil and Grease
	Solid waste	Litter, trash and debris	Gross Pollutants

# Appendix G

CASQA BMP HANDBOOK FACT SHEETS

# Scheduling

EC-1

JANUARY				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
		1	2 NTP MOBILIZATION	3
			9	10 Grading
6 Install erosion & sediment control measures	7	8 Land clearing		16
		13	14	15
				22
				23

## 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

## 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 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.

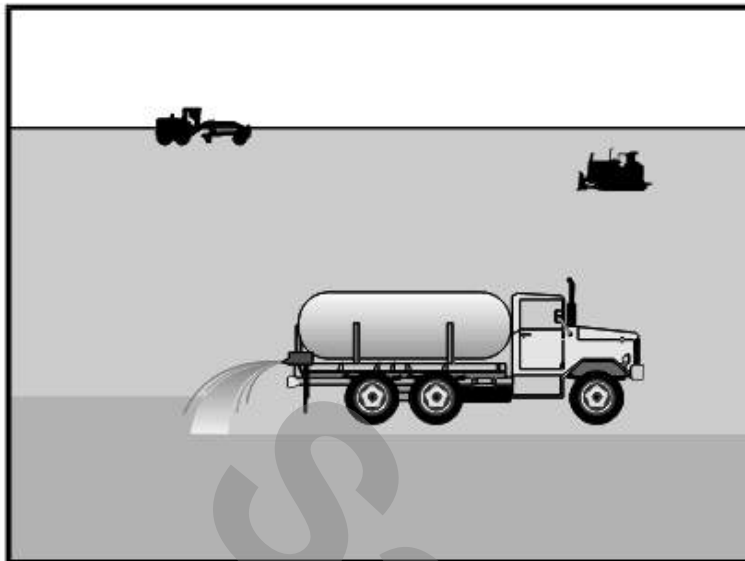
Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

Sample

---

# Wind Erosion Control

# WE-1



## 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

## 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:

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

EC-5 Soil Binders

- 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 repellent, 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.

---



# Wind Erosion Control

# WE-1

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.

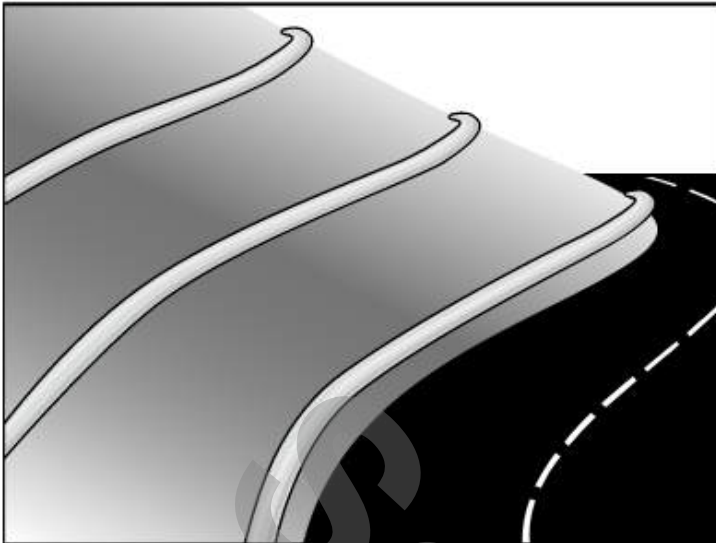
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Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM<sub>10</sub>), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Sample

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## 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-14 Biofilter Bags

- 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 biodegradable 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.

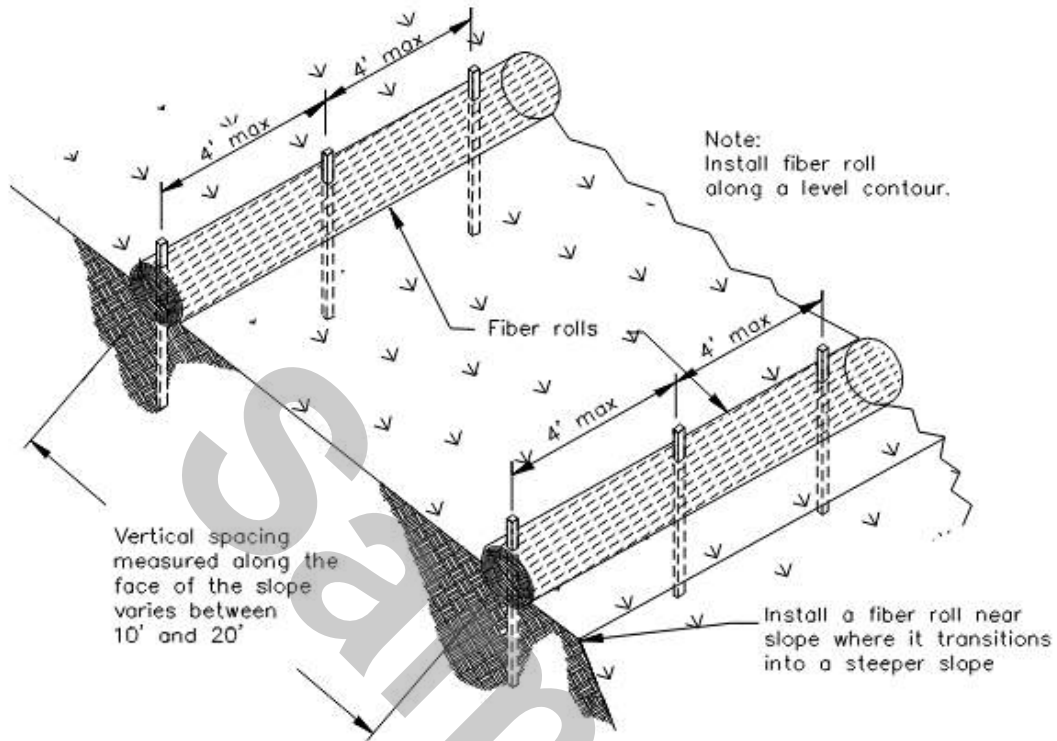
## References

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.

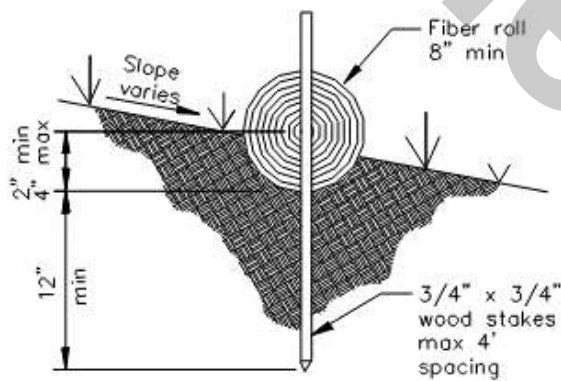
Sample

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TYPICAL FIBER ROLL INSTALLATION

N.T.S.



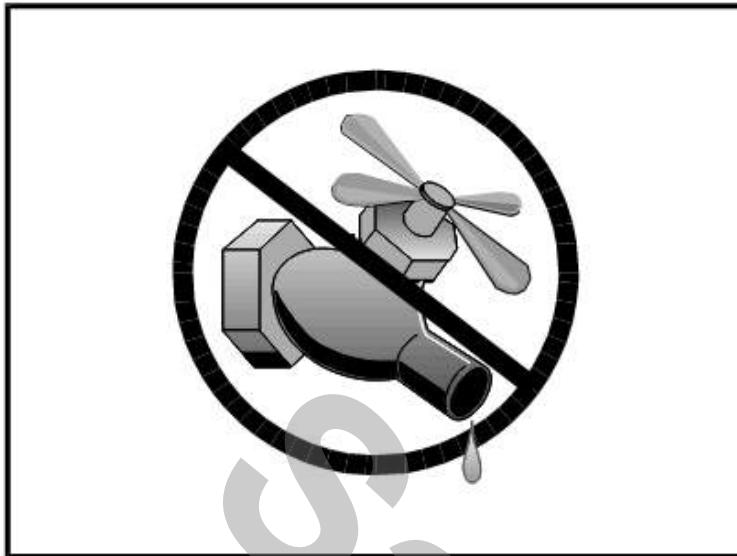
ENTRENCHMENT DETAIL

N.T.S.



# Water Conservation Practices

# NS-1



## 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.
- Direct construction water runoff to areas where it can soak

## 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



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 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.

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# Illicit Connection/Discharge

NS-6



## Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

## Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.

## Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

## Implementation

### Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.
- Inspect site regularly during project execution for evidence

## 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	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None

of illicit connections, illegal dumping or discharges.

- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

### ***Identification of Illicit Connections and Illegal Dumping or Discharges***

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
  - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
  - Abnormal water flow during the dry weather season
  - Unusual flows in sub drain systems used for dewatering
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
  - Abnormal water flow during the non-irrigation season
  - Non-standard junction structures
  - Broken concrete or other disturbances at or near junction structures

### ***Reporting***

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

### ***Cleanup and Removal***

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.

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## Costs

Costs to look for and report illicit connections and illegal discharges and dumping are low. The best way to avoid costs associated with illicit connections and illegal discharges and dumping is to keep the project perimeters secure to prevent access to the site, to observe the site for vehicles that should not be there, and to document any waste or hazardous materials that exist onsite before taking possession of the site.

## 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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

## 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.

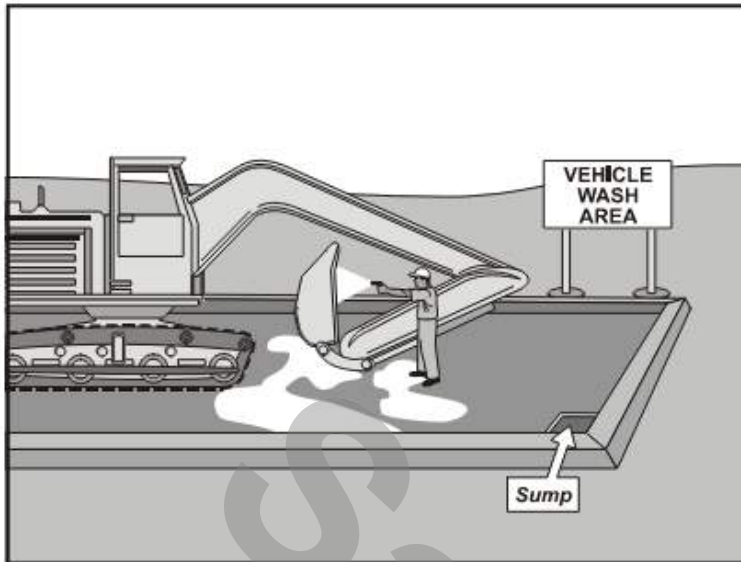
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

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# Vehicle and Equipment Cleaning

# 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

## 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:

## 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

- 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 and 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.

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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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- 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.

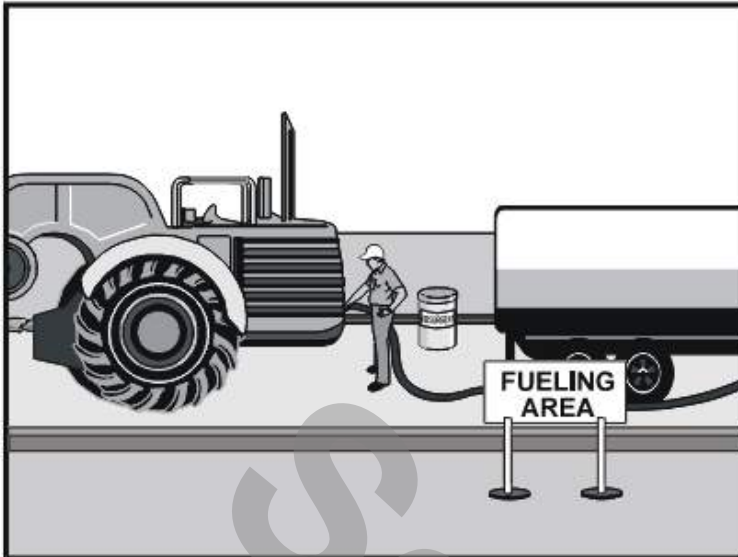
Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.

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# Vehicle and Equipment Fueling

# NS-9



## 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.
- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should

## 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

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**

- 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.

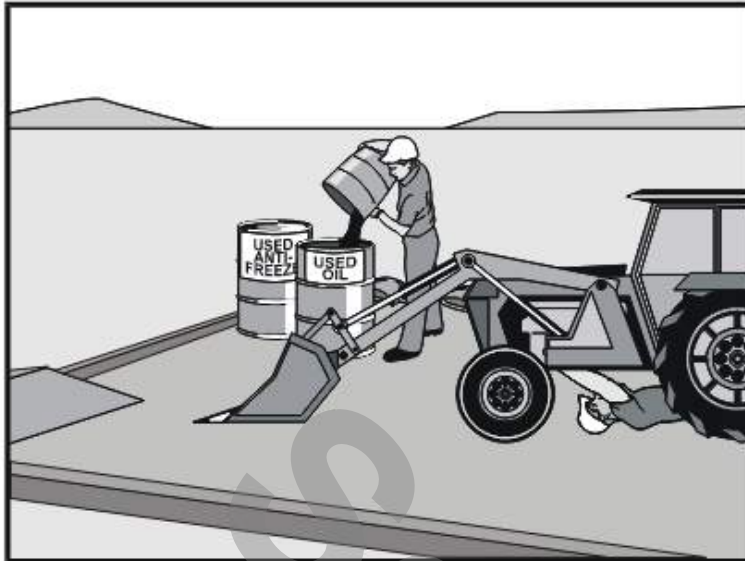
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Sample

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# 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, Vehicle and Equipment Cleaning, and NS-9, Vehicle and

## 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



# **Vehicle & Equipment Maintenance NS-10**

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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**

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- 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.

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# **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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- 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.

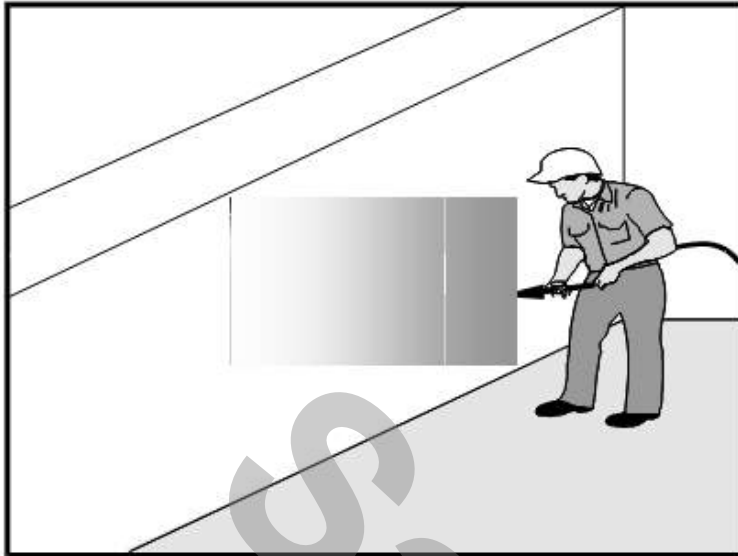
## **References**

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.

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### Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods.

Concrete and its associated curing materials have basic chemical properties that can raise the pH of water to levels outside of the permitted range. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Proper procedures and care should be taken when managing concrete curing materials to prevent them from coming into contact with stormwater flows, which could result in a high pH discharge.

### Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

### 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	<input checked="" type="checkbox"/>

### Legend:

- Primary Category
- Secondary Category

### Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

### Potential Alternatives

None



## **Limitations**

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

## **Implementation**

### ***Chemical Curing***

- Avoid over spray of curing compounds.
- Minimize the drift by applying the curing compound close to the concrete surface. Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.
- Use proper storage and handling techniques for concrete curing compounds. Refer to WM-1, Material Delivery and Storage.
- Protect drain inlets prior to the application of curing compounds.
- Refer to WM-4, Spill Prevention and Control.

### ***Water Curing for Bridge Decks, Retaining Walls, and other Structures***

- Direct cure water away from inlets and watercourses to collection areas for evaporation or other means of removal in accordance with all applicable permits. See WM-8 Concrete Waste Management.
- Collect cure water at the top of slopes and transport to a concrete waste management area in a non-erosive manner. See EC-9 Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

## **Education**

- Educate employees, subcontractors, and suppliers on proper concrete curing techniques to prevent contact with discharge as described herein.
- Arrange for the QSP or the appropriately trained contractor's superintendent or representative to oversee and enforce concrete curing procedures.

## **Costs**

All of the above measures are generally low cost.

## **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.
-

- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sample non-stormwater discharges and stormwater runoff that contacts uncured and partially cured concrete as required by the General Permit.
- Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.
- Inspect cure containers and spraying equipment for leaks.

## References

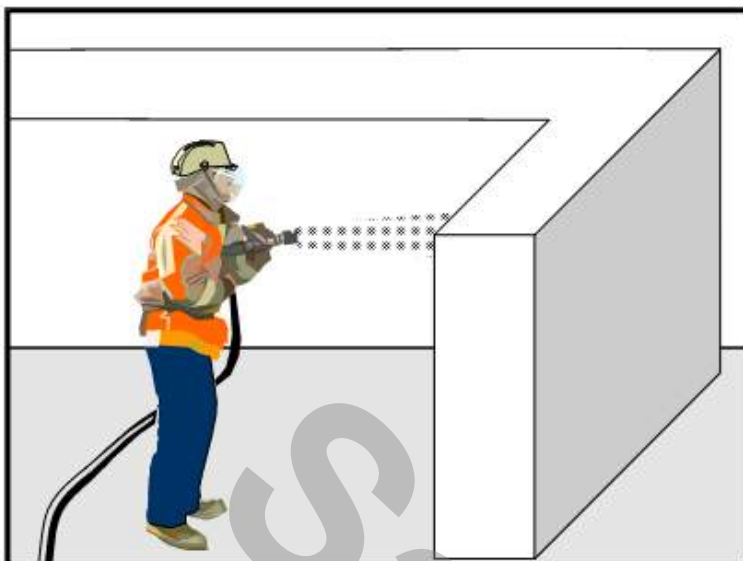
Blue Print for a Clean Bay-Construction-Related Industries: Best Management Practices for Stormwater Pollution Prevention; Santa Clara Valley Non Point Source Pollution Control Program, 1992.

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 Practices, EPA 832-R-92005; USEPA, April 1992.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

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### Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Concrete and its associated curing materials have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

### Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

### 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	<input checked="" type="checkbox"/>

### Legend:

- Primary Category
- Secondary Category

### Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	
Organics	<input checked="" type="checkbox"/>

### Potential Alternatives

None

## Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

## Implementation

- Collect and properly dispose of water from high-pressure water blasting operations.
- Collect contaminated water from blasting operations at the top of slopes. Transport or dispose of contaminated water while using BMPs such as those for erosion control. Refer to EC-9, Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Direct water from blasting operations away from inlets and watercourses to collection areas for infiltration or other means of removal (dewatering). Refer to NS-2 Dewatering Operations.
- Protect inlets during sandblasting operations. Refer to SE-10, Storm Drain Inlet Protection.
- Refer to WM-8, Concrete Waste Management for disposal of concrete debris.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to WM-6, Hazardous Waste Management.

## Education

- Educate employees, subcontractors, and suppliers on proper concrete finishing techniques to prevent contact with discharge as described herein.
- Arrange for the QSP or the appropriately trained contractor's superintendent or representative to oversee and enforce concrete finishing procedures.

## Costs

These measures are generally of low cost.

## 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.
  - Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
  - Sample non-stormwater discharges and stormwater runoff that contacts concrete dust and debris as required by the General Permit.
-

- Sweep or vacuum up debris from sandblasting at the end of each shift.
- At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.
- Inspect containment structures for damage prior to use and prior to onset of forecasted rain.

## 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), March 2003.

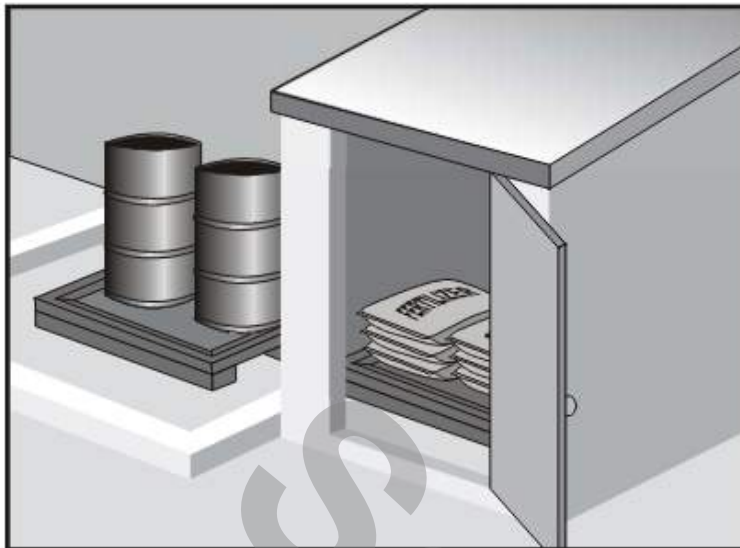
Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Sample

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# Material Delivery and Storage

# WM-1



## 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

## 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

## 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

- 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.
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- 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.

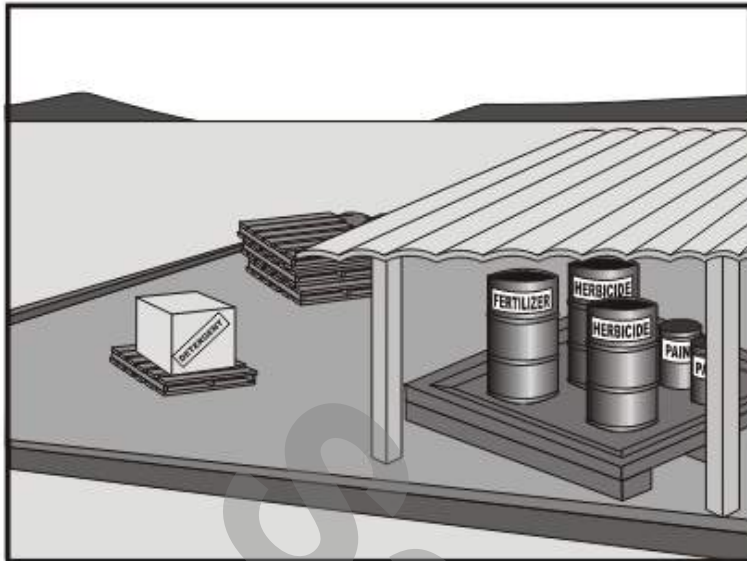
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

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.

# Material Use

# WM-2



### 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

### 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

### 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

## 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.

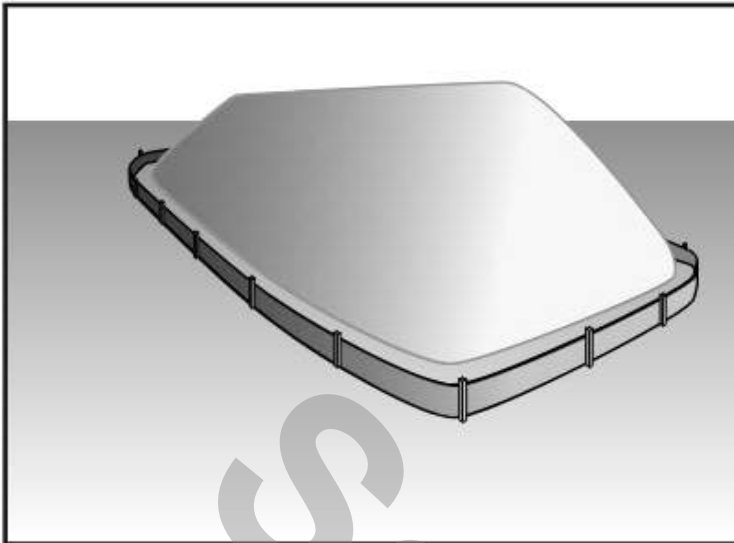
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

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# Stockpile Management

WM-3



## 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

- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- All stockpiles are required to be protected 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***

Non-active stockpiles of the identified materials should be protected further 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**

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.

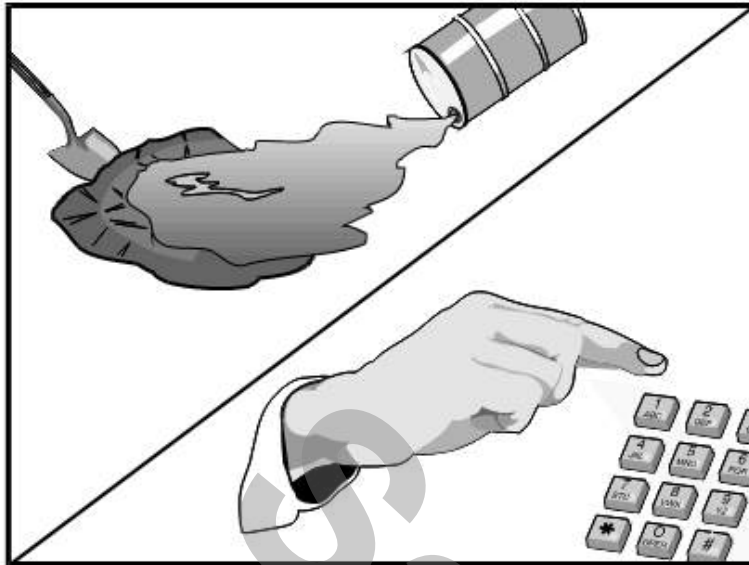
### **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

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# Spill Prevention and Control

# WM-4



### 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

### 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

- 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:

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## ***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 weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
  - 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.

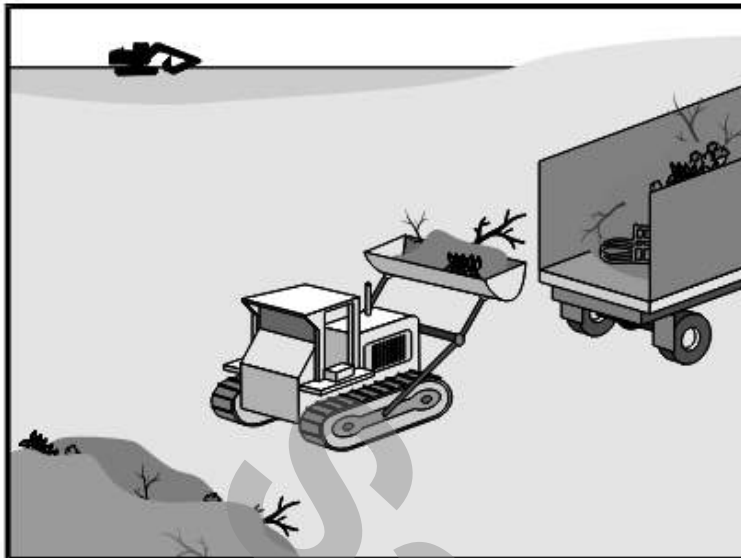
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Sample

# Solid Waste Management

# WM-5



### 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
- Highway planting wastes, including vegetative material,

### 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



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.
- 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 weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- 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.

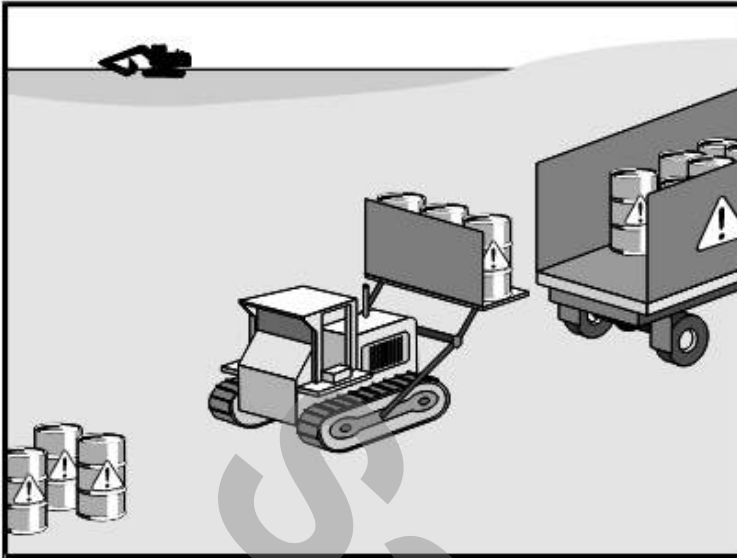
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

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# Hazardous Waste Management

# WM-6



## 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

## Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

## Suitable Applications

This best management practice (BMP) applies to all construction projects. Hazardous waste management practices are implemented on construction projects that generate waste from the use of:

- Petroleum Products
- Concrete Curing Compounds
- Palliatives
- Septic Wastes
- Stains
- Wood Preservatives
- Any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 CFR Parts 110, 117, 261, or 302
- Asphalt Products
- Pesticides
- Acids
- Paints
- Solvents
- Roofing Tar

## Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None

In addition, sites with existing structures may contain wastes, which must be disposed of in accordance with federal, state, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints
- Asbestos
- PCBs (particularly in older transformers)

## **Limitations**

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Nothing in this BMP relieves the contractor from responsibility for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
- This BMP does not cover aerially deposited lead (ADL) soils. For ADL soils refer to WM-7, Contaminated Soil Management.

## **Implementation**

The following steps will help reduce stormwater pollution from hazardous wastes:

### ***Material Use***

- Wastes should be stored in sealed containers constructed of a suitable material and should be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179.
  - All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.
  - Waste containers should be stored in temporary containment facilities that should comply with the following requirements:
    - Temporary containment facility should provide for a spill containment volume equal to 1.5 times the volume of all containers 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 tank within its boundary, whichever is greater.
    - Temporary containment facility should be impervious to the materials stored there for a minimum contact time of 72 hours.
    - Temporary containment facilities should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be placed into drums after each rainfall. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. 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.
  - Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.
  - Drums should not be overfilled and wastes should not be mixed.
  - Unless watertight, containers of dry waste should be stored on pallets.
  - Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.
  - Paint brushes and equipment for water and oil based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.
  - Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.
  - The following actions should be taken with respect to temporary contaminant:
    - Ensure that adequate hazardous waste storage volume is available.
    - Ensure that hazardous waste collection containers are conveniently located.
    - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.
    - Minimize production or generation of hazardous materials and hazardous waste on the job site.
    - Use containment berms in fueling and maintenance areas and where the potential for spills is high.
    - Segregate potentially hazardous waste from non-hazardous construction site debris.
    - Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.
-

- Clearly label all hazardous waste containers with the waste being stored and the date of accumulation.
- Place hazardous waste containers in secondary containment.
- Do not allow potentially hazardous waste materials to accumulate on the ground.
- Do not mix wastes.
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.

### ***Waste Recycling Disposal***

- Select designated hazardous waste collection areas onsite.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, making recycling impossible and complicating disposal.
- Recycle any useful materials such as used oil or water-based paint.
- 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.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g., excess oil-based paint and sludge) is collected, removed, and disposed of only at authorized disposal areas.

### ***Disposal Procedures***

- Waste should be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
  - A Department of Health Services certified laboratory should sample waste to determine the appropriate disposal facility.
  - Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.
  - Attention is directed to "Hazardous Material", "Contaminated Material", and "Aerially Deposited Lead" of the contract documents regarding the handling and disposal of hazardous materials.
-

## ***Education***

- Educate employees and subcontractors on hazardous waste storage and disposal procedures.
- Educate employees and subcontractors on potential dangers to humans and the environment from hazardous wastes.
- Instruct employees and subcontractors on safety procedures for common construction site hazardous wastes.
- Instruct employees and subcontractors in identification of hazardous and solid waste.
- Hold regular meetings to discuss and reinforce hazardous waste management procedures (incorporate into regular safety meetings).
- The contractor's superintendent or representative should oversee and enforce proper hazardous waste management procedures and practices.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

## **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 weekly during the rainy season and of two week intervals in the non-rainy season to verify continued BMP implementation.
  - Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
  - Hazardous waste should be regularly collected.
  - A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures.
  - Waste storage areas should be kept 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.
  - Hazardous spills should be cleaned up and reported in conformance with the applicable Material Safety Data Sheet (MSDS) and the instructions posted at the project site.
-



- The National Response Center, at (800) 424-8802, should be notified of spills of federal reportable quantities in conformance with the requirements in 40 CFR parts 110, 117, and 302. Also notify the Governors Office of Emergency Services Warning Center at (916) 845-8911.
- A copy of the hazardous waste manifests should be provided.

## 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.

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.

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# Contaminated Soil Management

# WM-7



### 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

### Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

### Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

### Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

### Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

### Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

### Potential Alternatives

None



plans, specifications, and SWPPP. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm a site assessment is completed before earth moving begins.

The following steps will help reduce stormwater pollution from contaminated soil:

- Conduct thorough, pre-construction inspections of the site and review documents related to the site. If inspection or reviews indicated presence of contaminated soils, develop a plan before starting work.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills. Contaminated soil can be expensive to treat and dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- The contractor may further identify contaminated soils by investigating:
  - Past site uses and activities
  - Detected or undetected spills and leaks
  - Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements
  - Contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
  - Suspected soils should be tested at a certified laboratory.

### ***Education***

- Have employees and subcontractors complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified, prior to performing any excavation work at the locations containing material classified as hazardous.
- Educate employees and subcontractors in identification of contaminated soil and on contaminated soil handling and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

### ***Handling Procedures for Material with Aerially Deposited Lead (ADL)***

- Materials from areas designated as containing (ADL) may, if allowed by the contract special provisions, be excavated, transported, and used in the construction of embankments and/or backfill.
  - Excavation, transportation, and placement operations should result in no visible dust.
  - Caution should be exercised to prevent spillage of lead containing material during transport.
-

- Quality should be monitored during excavation of soils contaminated with lead.

### ***Handling Procedures for Contaminated Soils***

- Minimize onsite storage. Contaminated soil should be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 66265.250 to 66265.260.
- Test suspected soils at an approved certified laboratory.
- Work with the local regulatory agencies to develop options for treatment or disposal if the soil is contaminated.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- Take the following precautions if temporary stockpiling is necessary:
  - Cover the stockpile with plastic sheeting or tarps.
  - Install a berm around the stockpile to prevent runoff from leaving the area.
  - Do not stockpile in or near storm drains or watercourses.
- Remove contaminated material and hazardous material on exteriors of transport vehicles and place either into the current transport vehicle or into the excavation prior to the vehicle leaving the exclusion zone.
- Monitor the air quality continuously during excavation operations at all locations containing hazardous material.
- Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material.
- Collect water from decontamination procedures and treat or dispose of it at an appropriate disposal site.
- Collect non-reusable protective equipment, once used by any personnel, and dispose of at an appropriate disposal site.
- Install temporary security fence to surround and secure the exclusion zone. Remove fencing when no longer needed.
- Excavate, transport, and dispose of contaminated material and hazardous material in accordance with the rules and regulations of the following agencies (the specifications of these agencies supersede the procedures outlined in this BMP):
  - United States Department of Transportation (USDOT)
  - United States Environmental Protection Agency (USEPA)
  - California Environmental Protection Agency (CAL-EPA)

# **Contaminated Soil Management** **WM-7**

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- Implement WM-4, Spill Prevention and Control, to prevent leaks and spills as much as possible.

## **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.

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.

Sample

# Concrete Waste Management

# WM-8



### Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

### Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.

### 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	<input checked="" type="checkbox"/>

### Legend:

- Primary Category
- Secondary Category

### Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	
Organics	

### Potential Alternatives

None

- Concrete trucks and other concrete-coated equipment are washed onsite.
- Mortar-mixing stations exist.
- Stucco mixing and spraying .
- See also NS-8, Vehicle and Equipment Cleaning.

## **Limitations**

- Offsite washout of concrete wastes may not always be possible.
- Multiple washouts may be needed to assure adequate capacity and to allow for evaporation.

## **Implementation**

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Store dry and wet materials under cover, away from drainage areas. Refer to WM-1, Material Delivery and Storage for more information.
- Avoid mixing excess amounts of concrete.
- Perform washout of concrete trucks in designated areas only, where washout will not reach stormwater.
- Do not wash out concrete trucks into storm drains, open ditches, streets, streams or onto the ground. Trucks should always be washed out into designated facilities.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
  - On larger sites, it is recommended to locate washout areas at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
  - Washout wastes into the temporary washout where the concrete can set, be broken up, and then disposed properly.
  - Washout should be lined so there is no discharge into the underlying soil.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose in the trash.
- See typical concrete washout installation details at the end of this fact sheet.

## **Education**

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
-

- Arrange for contractor's superintendent or representative to oversee and enforce concrete waste management procedures.
- Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.

### ***Concrete Demolition Wastes***

- Stockpile concrete demolition waste in accordance with BMP WM-3, Stockpile Management.
- Dispose of or recycle hardened concrete waste in accordance with applicable federal, state or local regulations.

### ***Concrete Slurry Wastes***

- PCC and AC waste should not be allowed to enter storm drains or watercourses.
- PCC and AC waste should be collected and disposed of or placed in a temporary concrete washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below).
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Saw-cut concrete slurry should not be allowed to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine or by sweeping. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement. See also NS-3, Paving and Grinding Operations; and WM-10, Liquid Waste Management.
- Concrete slurry residue should be disposed in a temporary washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

### ***Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures***

- Temporary concrete washout facilities should be located a minimum of 50 ft from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
  - A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
  - Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
-



- Temporary washout facilities should have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
  - Temporary washout facilities should be lined to prevent discharge to the underlying ground or surrounding area.
  - Washout of concrete trucks should be performed in designated areas only.
  - Only concrete from mixer truck chutes should be washed into concrete wash out.
  - Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of or recycled offsite.
  - Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per WM-5, Solid Waste Management. Dispose of or recycle hardened concrete on a regular basis.
  - Temporary Concrete Washout Facility (Type Above Grade)
    - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft; however, smaller sites or jobs may only need a smaller washout facility. With any washout, always maintain a sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
    - Materials used to construct the washout area should conform to the provisions detailed in their respective BMPs (e.g., SE-8 Sandbag Barrier).
    - Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
    - Alternatively, portable removable containers can be used as above grade concrete washouts. Also called a "roll-off"; this concrete washout facility should be properly sealed to prevent leakage, and should be removed from the site and replaced when the container reaches 75% capacity.
  - Temporary Concrete Washout Facility (Type Below Grade)
    - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
    - Lath and flagging should be commercial type.
    - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
-

- The base of a washout facility should be free of rock or debris that may damage a plastic liner.

### ***Removal of Temporary Concrete Washout Facilities***

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and properly disposed or recycled in accordance with federal, state or local regulations. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and properly disposed or recycled in accordance with federal, state or local regulations..
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

### **Costs**

All of the above are low cost measures. Roll-off concrete washout facilities can be more costly than other measures due to removal and replacement; however, provide a cleaner alternative to traditional washouts. The type of washout facility, size, and availability of materials will determine the cost of the washout.

### **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.
- Temporary concrete washout facilities should be maintained to provide adequate holding capacity with a minimum freeboard of 4 in. for above grade facilities and 12 in. for below grade facilities. Maintaining temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and properly disposed or recycled in accordance with federal, state or local regulations.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- Inspect washout facilities for damage (e.g. torn liner, evidence of leaks, signage, etc.). Repair all identified damage.

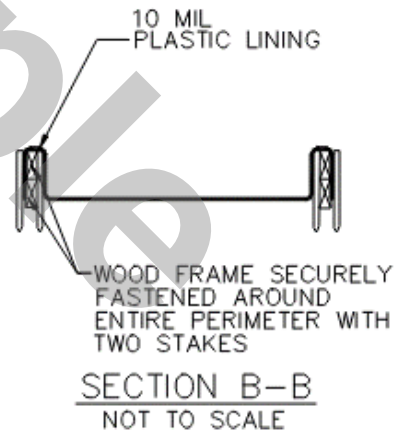
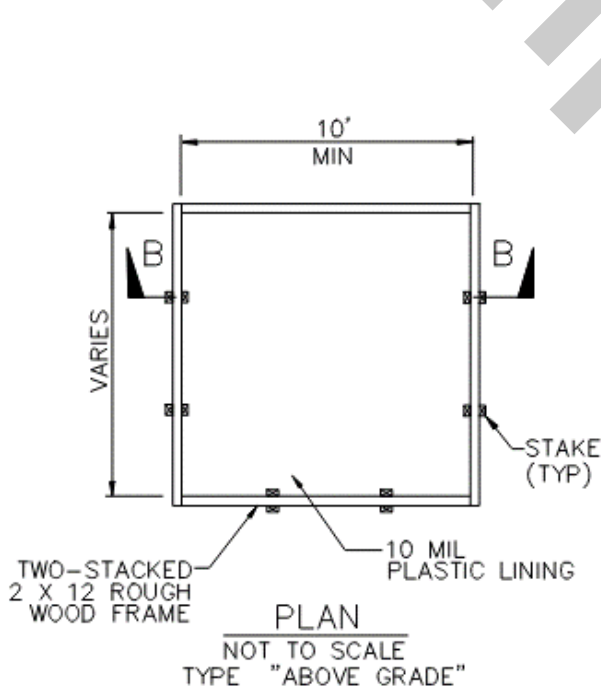
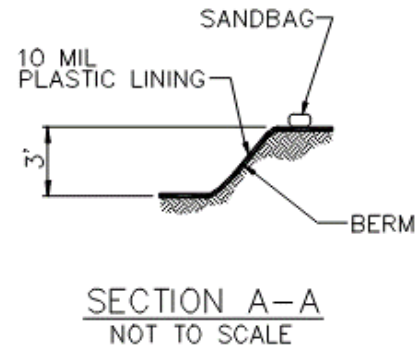
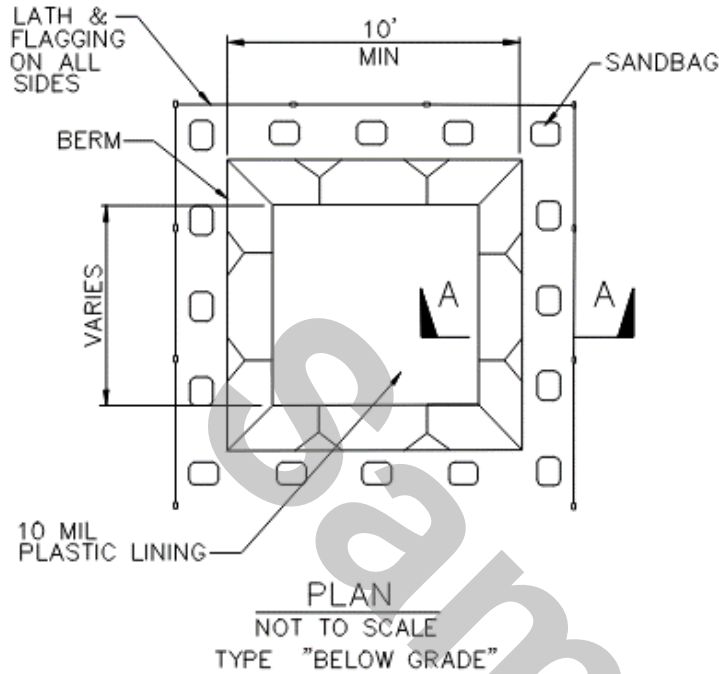
### **References**

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, Updated 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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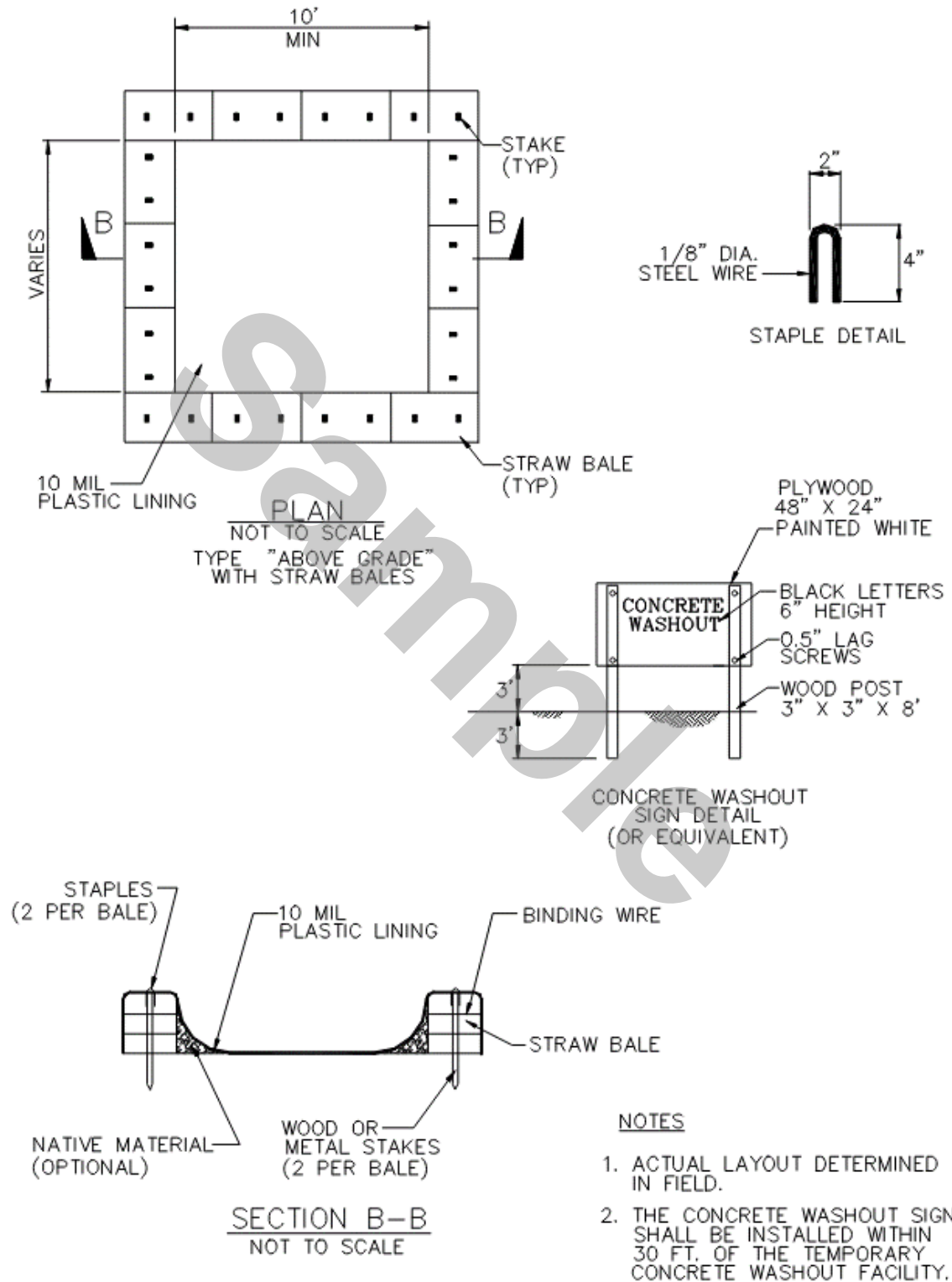


### NOTES

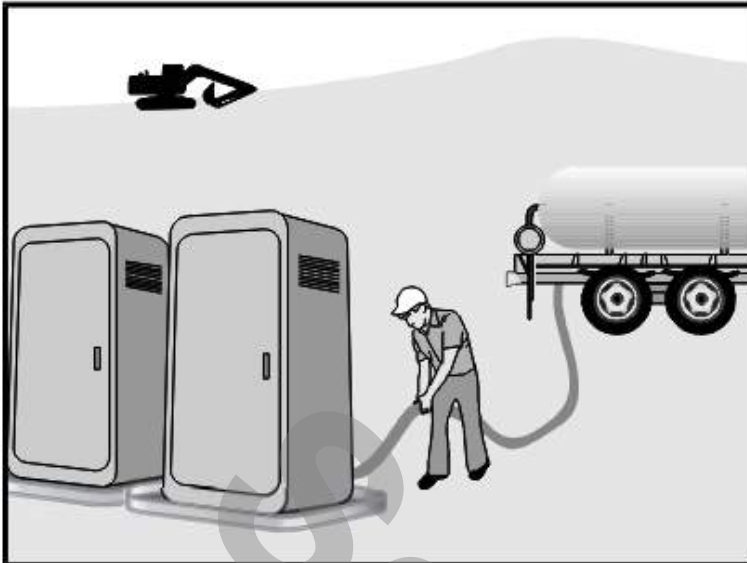
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

# Concrete Waste Management

# WM-8



# 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

# **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**

## **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.

Sample



# Appendix H

Inspection Logs



## BMP INSPECTION REPORT

Date and Time of Inspection:		Date Report Written:		
Inspection Type: (Circle one)	<i>Weekly Complete Parts I, II, III and VII</i>	<i>Pre-Storm Complete Parts I, II, III, IV and VII</i>	<i>During Rain Event Complete Parts I, II, III, V, and VII</i>	<i>Post-Storm Complete Parts I, II, III, VI and VII</i>
<b>Part I. General Information</b>				
<b>Site Information</b>				
Construction Site Name:				
Construction stage and completed activities:			Approximate area of site that is exposed:	
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:	
<b>Weather</b>				
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)		
Estimate time since last storm: (days or hours)		Rain gauge reading and location: (in)		
Is a "Qualifying Event" predicted or did one occur (i.e., 0.5" rain with 48-hrs or greater between events)? (Y/N) 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.				
<b>Inspector Information</b>				
Inspector Name:			Inspector Title:	
Signature:			Date:	

**Part II. BMP Observations. Describe deficiencies in Part III.**

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			

<b>Part II. BMP Observations Continued. Describe deficiencies in Part III.</b>			
<b>Minimum BMPs for Risk Level _____ Sites</b>	<b>Adequately designed, implemented and effective (yes, no, N/A)</b>	<b>Action Required (yes/no)</b>	<b>Action Implemented (Date)</b>
<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-Stormwater Management</b>			
Non-Stormwater discharges are properly controlled			
Vehicles are washed in a manner to prevent non-stormwater discharges to surface waters or drainage systems			
Streets are cleaned in a manner to prevent unauthorized non-stormwater 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			
Linear sediment control along toe of slope, face of slope and at grade breaks (Risk Level 2 & 3 Only)			
Limit construction activity to and from site to entrances and exits that employ effective controls to prevent offsite tracking (Risk Level 2 & 3 Only)			

Ensure all storm, drain inlets and perimeter controls, runoff control BMPs and pollutants controls at entrances and exits are maintained and protected from activities the reduce their effectiveness (Risk Level 2 & 3 Only)			
Inspect all immediate access roads daily (Risk Level 2 & 3 Only)			
<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>			
Are the project SWPPP and BMP plan up to date, available on-site and being properly implemented?			

<b>Part III. Descriptions of BMP Deficiencies</b>		
Deficiency	Repairs Implemented: Note - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible.	
	Start Date	Action
1.		
2.		
3.		
4.		

<b>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).</b>	
	Yes, No, N/A
Do stormwater 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 stormwater storage and containment areas free of leaks? If no, complete Parts III and/or VII and describe below.	



**Part VI. Additional Post-Storm Observations.** Visually observe (inspect) stormwater 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 stormwater 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

<b>Risk Level 1, 2, 3 Visual Inspection Field Log Sheet</b>						
Date and Time of Inspection:				Report Date:		
Inspection Type:	<input type="checkbox"/> Weekly	<input type="checkbox"/> Before predicted rain	<input type="checkbox"/> During rain event	<input type="checkbox"/> Following qualifying rain event	<input type="checkbox"/> Contained stormwater release	<input type="checkbox"/> Quarterly non-stormwater
<b>Site Information</b>						
Construction Site Name:						
Construction stage and completed activities:					Approximate area of exposed site:	
<b>Weather and Observations</b>						
Date Rain Predicted to Occur:				Predicted % chance of rain:		
Estimate storm beginning: _____		Estimate storm duration: _____		Estimate time since last storm: _____	Rain gauge reading: _____	
(date and time)		(hours)		(days or hours)	(inches)	
Observations: If yes identify location						
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Floating material	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Suspended Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Sheen	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
<b>Site Inspections</b>						
<b>Outfalls or BMPs Evaluated</b>			<b>Deficiencies Noted</b>			
(add additional sheets or attached detailed BMP Inspection Checklists)						
Photos Taken:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:			
<b>Corrective Actions Identified (note if SWPPP/REAP change is needed)</b>						
<b>Inspector Information</b>						
Inspector Name:				Inspector Title:		
Signature:					Date:	

# Appendix I

Monitoring Records

Sample



Sample

# Appendix J

Weather Reports



# Appendix K

Training Reporting Form

# Trained Contractor Personnel Log

## Stormwater Management Training Log and Documentation

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

WDID #: \_\_\_\_\_

Stormwater Management Topic: (check as appropriate)

- |                                                    |                                                                           |
|----------------------------------------------------|---------------------------------------------------------------------------|
| <input type="checkbox"/> Erosion Control           | <input type="checkbox"/> Sediment Control                                 |
| <input type="checkbox"/> Wind Erosion Control      | <input type="checkbox"/> Tracking Control                                 |
| <input type="checkbox"/> Non-Stormwater Management | <input type="checkbox"/> Waste Management and Materials Pollution Control |
| <input type="checkbox"/> Stormwater Sampling       |                                                                           |

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).

Appendix L

Responsible Parties

**Authorization of Approved Signatories**

Project Name:   @a  \_\_\_\_\_

WDID #: \_\_\_\_\_

Name of Personnel	Project Role	Company	Signature	Date

\_\_\_\_\_  
LRP's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
LRP Name and Title

\_\_\_\_\_  
Telephone Number

## Identification of QSP

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

WDID #: \_\_\_\_\_

The following are QSPs associated with this project

Name of Personnel <sup>(1)</sup>	Company	Date

(1) If additional QSPs are required on the job site add additional lines and include information here

Sample



# Appendix M

Contractors and Subcontractors

Sample

# Appendix N

General Construction Permit

Sample

Sample