Appendix E1

Stormwater Pollution Prevention Plan

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BURNS McDONNELL

SKYCHARGER

Stormwater Pollution Prevention Plan

Zero-Emission Truck Charging Facility

Project No. 172466

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August 22, 2025

Contents

1.0 Site Information 2
1.1 Project and Site Description 2
1.2 Owners (LRP) Information 2
1.3 Project Management Information 2
1.4 Construction Manager Information 2
1.5 Qualified SWPPP Developer 2
1.6 Qualified SWPPP Practitioner 3
1.7 Risk Level 3

2.0 SWPPP Requirements 4
2.1 Permit Registration Documents 4
2.2 SWPPP Availability and Implementation 5
2.3 SWPPP Amendments 5
2.4 Retention of Records 6
2.5 Reporting 6
2.6 Required Non-Compliance Reporting 7
2.7 Changes to Permit Coverage 7
2.8 Notice of Termination 8

3.0 Project Information 9
3.1 Project and Site Description 9
3.1.1 Site Description 9
3.1.2 Existing Conditions 9
3.1.3 Existing Drainage 9
3.1.4 Geology and Groundwater 10
3.1.5 Project Description 10
3.1.6 Developed Condition 10
3.2 Permits and Governing Documents 11
3.3 Stormwater Run-On from Off-Site Areas 11
3.4 Findings of the Construction Site Sediment and Receiving Water Risk Determination 11
3.5 Threat to Water Quality 12
3.6 Construction Schedule 12
3.7 Potential Construction Activity and Pollutant Sources 13
3.8 TMDL Requirements 15
3.9 Identification of Non-Stormwater Discharges 15
3.10 Required Site Map Information 15

DRAFT

4.0 Best Management Practices 23
4.1 Schedule for BMP Implementation 23
4.2 Limitations on the Extent of Disturbed Soil Area (DSA) 24
4.3 Erosion and Sediment Control 25
4.3.1 Erosion Controls 25
4.3.2 Sediment Controls 29
4.4 Non-Stormwater Controls and Waste and Materials Management 32
4.4.1 Materials Management and Waste Management 35
4.5 Post-Construction Stormwater Management Measures 38

5.0 BMP Inspection and Maintenance 39
5.1 BMP Inspection and Maintenance 39

6.0 Training 40

7.0 Responsible Parties and Operators 41
7.1 Responsible Parties 41
7.2 Contractor List 43

8.0 Construction Site Monitoring Program (CSMP) 44
8.1 Purpose 44
8.2 Applicability of Permit Requirements 44
8.3 Weather and Precipitation Event Tracking 44
8.4 Weather Tracking 44
8.5 Rain Gauges 44
8.6 Monitoring Locations 45
8.7 Safety and Monitoring Exemptions 45
8.8 Visual Monitoring 45
8.9 Routine Observations and Inspections 46
8.9.1 Routine BMP Inspections 46
8.9.2 Non-Stormwater Discharge Observations 46
8.9.3 QPE Triggered Observations and Inspections 46
8.9.4 Visual Observations Prior to a Forecasted QPE 47
8.9.5 BMP Inspections During a QPE 47
8.9.6 Visual Observations Following a QPE 47
8.9.7 Visual Monitoring Procedures 47
8.9.8 Visual Monitoring Follow-Up and Reporting 48
8.9.9 Visual Monitoring Locations 48
8.10 Water Quality Sampling and Analysis 48
8.10.1 Sampling and Analysis Plan for Non-Visible Pollutants in Stormwater Runoff Discharges 48
8.10.2 Sampling Schedule 49

DRAFT

8.10.3 Sampling Locations 49
8.10.4 Monitoring Preparation 50
8.10.5 Sample Collection 50
8.10.6 Analytical Constituents 51
8.10.7 Sample Analysis 51
8.10.8 Data Evaluation and Reporting 8-1
8.10.9 Sampling and Analysis Plan for pH and Turbidity in Stormwater Runoff Discharges 8-1
8.10.10 Sampling and Analysis Plan for pH and Turbidity in Receiving Water 8-1
8.10.11 Sampling and Analysis Plan for Non-Stormwater Discharges 8-1
8.10.11.1 Sampling and Analysis Plan for Dewatering Discharges 8-1
8.10.12 Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board 8-3
8.10.13 Training of Sampling Personnel 8-3
8.10.13.1 Sample Collection and Handling 8-3
8.11 Active Treatment System Monitoring 8-5
8.12 Passive Treatment Monitoring 8-5
8.13 Watershed Monitoring Option 8-5
8.14 Quality Assurance & Quality Control 8-6
8.14.1 Field Logs 8-6
8.14.2 Clean Sampling Techniques 8-6
8.14.3 Chain of Custody 8-6
8.14.4 QA/QC Samples 8-6
8.14.4.1 Field Duplicates 8-7
8.14.4.2 Equipment Blanks 8-7
8.14.4.3 Field Blanks 8-7
8.14.4.4 Travel Blanks 8-7
8.14.4.5 Data Verification 8-7
8.15 Records Retention 8-8
9.0 References 9-1
CSMP Attachment 1: Weather Reports 9-1
CSMP Attachment 2: Monitoring Records 9-1
CSMP Attachment 3: Example Forms 9-1
CSMP Attachment 4: Field Meter Instructions 9-1

DRAFT

Appendix A Calculations
Appendix B Site Maps
Appendix C Permit Registration Documents
Appendix D SWPPP Amendment QSD Certifications
Appendix E Submitted Changes of Information to PRDs
Appendix F Construction Schedule
Appendix G Construction Activities, Materials Used, and Associated Pollutants
Appendix H CASQA Stormwater BMP Handbook Portal: Construction Fact Sheets
Appendix I BMP Inspection Form
Appendix J Training Reporting Form
Appendix K Responsible Parties
Appendix L Contractors and Subcontractors
Appendix M Construction General Permit

Tables

Table 1-1 Site Information 2
Table 3-1 Construction Site Estimates 11
Table 3-2 Summary of Sediment Risk 11
Table 3-3 Summary of Receiving Water Risk 12
Table 3-4 Construction Activities and Associated Materials 13
Table 3-5 Required Map Information for Grading and Land Development Phase 16
Table 3-6 Required Map Information for Streets and Utilities Phase 18
Table 3-7 Required Map Information for Vertical Construction Phase 19
Table 3-8 Required Map Information for Final Landscaping and Site Stabilization Phase 20
Table 4-1 BMP Implementation Schedule 23
Table 4-2 Temporary Erosion Control BMPs 27
Table 4-3 Temporary Sediment Control BMPs 30
Table 4-4 Temporary Non-Stormwater BMPs 33
Table 4-5 Temporary Materials Management BMPs 36
Table 8-1 Summary of Visual Monitoring and Inspections 46
Table 8-2 Potential Non-Visible Pollutants and Water Quality Indicator Constituents Based on the Pollutant Source Assessment 49
Table 8-3 Unplanned Non-Visible Pollutant Sample Locations 49
Table 8-4 Sample Collection, Preservation and Analysis for Monitoring Non Visible Pollutants 52
Table 8-5 Sample Collection and Analysis for Monitoring Turbidity and pH 8-2

Table 8-6 Numeric Action Levels 8-2
Table 8-7 Dewatering Notification Contacts 8-3

DRAFT

List of Abbreviations

Abbreviation	Term/Phrase/Name
ADA	Americans with Disabilities Act
ATS	Active Treatment System
BAT/BCT	Best Available Technology/Best Control Technology
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CASQA	California Stormwater Quality Association
CEMS	Caltrans Environmental Management System
C.F.R.	Code of Federal Regulations
CGP	Construction General Permit
COD	Chemical Oxygen Demand
CoC	Chain of Custody
DAR	Duly Authorized Representative
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
ERA	Exceedance Response Action
IGP	Industrial General Permit
LRP	Legally Responsible Person
MDL	Method Detection Limit
MIP	Monitoring Implementation Plan
MS4	Municipal Separate Storm Sewer System
msl	mean sea level
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NOAA/NWS	National Oceanic and Atmospheric Administration/National Weather Service
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSWD	Non-Stormwater Discharge
NTU	Nephelometric Turbidity Unit
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PRD	Permit Registration Documents
QA/QC	Quality Assurance Quality Control
QISP	Qualified Industrial Stormwater Practitioner
QSD	Qualified SWPPP Developer
QSE	Qualifying Storm Event
QSP	Qualified SWPPP Practitioner
RUSLE	Revised Universal Soil Loss Equation
SIC	Standard Industrial Classification
SMARTS	Stormwater Multi Application and Report Tracking System

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Abbreviation	Term/Phrase/Name
SVOCs	Semi-Volatile Organic Compounds
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds

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Qualified SWPPP Developer

Project Name: Skycharger Zero-Emission Truck Charging Facility

Project Number/ID BMcD: 172466

"This Stormwater Pollution Prevention Plan (SWPPP) and its appendices were prepared under my direction to meet the requirements of the California Construction General Permit (Order No. 2022-0057-DWQ, NPDES No. CAS000002) (2022 CGP). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below and will maintain up to date credentials for the duration of the Project." (Include a copy of QSD Certification).

QSD Signature

Date

QSD Name

QSD Certificate Number

Title and Affiliation

Telephone Number

Email

Certification

I hereby certify, as a Professional Engineer in the state of California, that the information in this document was assembled under my direct personal charge. This report is not intended or represented to be suitable for reuse by the Skycharger or others without specific verification or adaptation.

Professional Name, License Number and State

Date:

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Amendment Log

Project Name: Skycharger Zero-Emission Truck Charging Facility

Project Number/ID BMcD: 172466

Amendment No.	Date	Requested By	Brief Description of Amendment; include reason for change, site location, and BMP modifications. Include Page and Section No.	Prepared & Approved By:
				QSD: Date:
				QSD: Date:
				QSD: Date:
				QSD: Date:
				QSD: Date:
				QSD: Date:

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The Stormwater Pollution Prevention Plan (SWPPP) will be revised when:

- There is a 2022 CGP violation (2022 CGP Section VI.Q.1)
- There is a reduction or increase in total disturbed acreage (2022 CGP Section III.F.2. and F.4)
- Best management practices are not effective and are not resulting in a reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges (2022 CGP Section VI.Q.1 and Attachment E Section III.C.5)
- There is a change in the Project duration that changes the Project Risk Type (2022 CGP Section III.F.1)
- Dischargers with Projects where all construction activities (including passive treatment, active treatment systems, and/or active equipment) will be suspended for 30 days or more (2022 CGP Section III.G)
- There is a change in construction or operations that may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (2022 CGP Sections IV.O. and VI.Q.1)
- When deemed necessary by the Qualified SWPPP Developer (QSD)

The QSD has determined that the changes listed in Section 2.4 can be field determined by the QSP. All other changes will be made by the QSD as formal amendments to the SWPPP. Note that the 2022 CGP requires that the QSD "revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations" (2022 CGP, Section V.C.2.).

SWPPP Amendment QSD Certifications are located in Appendix D.

This SWPPP has been prepared as a draft document. It is provided for review and coordination purposes only and is not intended for use as a final document for construction activities. The contents of this draft SWPPP are subject to revision and should not be relied upon as the approved plan of record. A finalized and signed SWPPP will be issued prior to the start of construction.

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Legally Responsible Person

Project Name: Skycharger Zero-Emission Truck Charging Facility

Project Number/ID BMcD: 172466

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

Legally Responsible Person

Signature of Legally Responsible Person or Approved Signatory

Date

Name of Legally Responsible Person or Approved Signatory

Telephone Number

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1.0 Site Information

Table 1-1 Site Information

Project Name	Skycharger Zero-Emission Truck Charging Facility
Project Location	1640 Tidelands Ave National City, CA 91950
Project Duration	August 2026 - May 2027 (9 months)
Size of Site	Approximately 4.2 acres (Includes paved/non-DSA laydown area)
Approximate size of Disturbed Soil Area (DSA)	1 acre (approx. 43,560 square feet)

1.1 Project and Site Description

The Project includes grading and utility trenching to support new site infrastructure, construction of improvements for Americans with Disabilities Act (ADA) compliance, and development of a convenience store facility. In general, the work will include installation of underground utilities within designated trench alignments, construction of accessible pathways and associated site features, and installation of foundations and pylons to support a solar array in addition to electric vehicle charging stalls.

1.2 Owners (LRP) Information

Name:
Address:
Telephone:

1.3 Project Management Information

Name:
Address:
Telephone:
Email Address:

1.4 Construction Manager Information

Construction Manager or Superintendent's Name:
Address:
Telephone:
Email Address:

1.5 Qualified SWPPP Developer

Name:
Address:
Telephone:
Email Address:

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1.6 Qualified SWPPP Practitioner

Name:
Address:
Telephone:
Email Address:

1.7 Risk Level

The CGP Risk Level for this Project is Risk Level 1. Appendix B provides the sediment risk factor calculations and the receiving water risk determination that support the Project's overall risk designation. The receiving water for this Project is San Diego Bay, which is listed under the Clean Water Act Section 303(d) as an impaired water body. It is listed as impaired by mercury, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). However, San Diego Bay is not listed as impaired for sediment.

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2.0 SWPPP Requirements

This SWPPP is designed to comply with California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (2022 CGP) Order No. 2022-0057-DWQ (NPDES No. CAS000002) issued by the State Water Resources Control Board (State Water Board). This SWPPP has been prepared following the 2022 CGP SWPPP Template for Traditional Projects provided on the California Stormwater Quality Association Stormwater Best Management Practice Handbook Portal: Construction (CASQA 2024). This Project is considered a traditional construction Project.

In accordance with the 2022 CGP, Section IV.O, this SWPPP is designed to address the following:

- Identification of all pollutants, their sources, and control mechanisms, including sources of sediment associated with construction, construction site erosion and other activities associated with construction activity (e.g., sediment, paint, cement, stucco, cleaners, site erosion)
- Pollutant source assessments, including a list of potential pollutant sources and identification of site areas where additional best management practices (BMPs) are necessary to reduce or prevent pollutants in stormwater and authorized non-stormwater discharges, per the minimum requirements when developing the pollutant source assessment
- Description of site-specific BMPs implemented to reduce or eliminate stormwater pollution
- Non-stormwater discharges identification, and either elimination, control, or treatment are required, where not otherwise required to be under a Regional Water Quality Control Board (Regional Water Board) permit
- Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard
- Stabilization BMPs are installed to reduce or eliminate pollutants after construction is completed are effective and maintained
- Calculations and design details are complete and correct in Appendix A.

2.1 Permit Registration Documents

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Stormwater Multi Application and Report Tracking System (SMARTS) prior to commencement of construction by the Legally Responsible Person (LRP), or duly authorized personnel (DAR [i.e., Approved Signatory]) under the direction of the LRP. The Project-specific PRDs include (2022 CGP Section III.A):

1. Notice of Intent (NOI)
2. Risk Level Determination (Construction Site Sediment and Receiving Water Risk Determination)
3. Site Drawings and Map
4. SWPPP
5. Applicable plans, calculations, and other supporting documentation for compliance with the Phase I or Phase II municipal separate storm sewer system (MS4) post-construction requirements or the post-construction standards of the 2022 CGP
6. Annual Fee per the current fee schedule for National Pollutant Discharge Elimination System (NPDES) stormwater permits per 23 California Code of Regulations, Chapter 9

7. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal).
8. Additional PRDs may be required depending on the construction type and location. Modify as needed and include with the above listing.

Site Maps can be found in Appendix B. A copy of the submitted PRDs shall also be kept in Appendix C, along with the Waste Discharge Identification (WDID) confirmation.

2.2 SWPPP Availability and Implementation

The Contractor shall make the SWPPP available at the construction site during working hours listed on the title sheet, while construction is occurring, and shall be made available upon request by a federal, state, or municipal inspector. A current copy of the site-specific SWPPP and any site inspection reports required by the 2022 CGP may be kept in electronic format at the Site so long as the information requested by a federal, state, or municipal inspector can be made available during an inspection. Legible maps in hard copy must be available at the Site (2022 CGP Section IV.O.1.).

The SWPPP must be implemented at the appropriate level to protect water quality at all times, throughout the life of the Project. The SWPPP must remain on the Site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the 2022 CGP.

2.3 SWPPP Amendments

SWPPP changes or amendments will be uploaded through SMARTS within 30 calendar days.
The SWPPP should be revised when:

- There is a 2022 CGP violation (2022 CGP Section VI.Q.1)
- There is a reduction or increase in total disturbed acreage (2022 CGP Section III.F.2 and F.4)
- BMPs are not effective and are not resulting in a reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges (2022 CGP Section VI.Q.1 and Attachment D Section III.C.5)
- There is a change in the Project duration that changes the Project's risk level (2022 CGP Section III.F.1)
- Dischargers with Projects where all construction activities (including passive treatment, ATSs, and/or active equipment) will be suspended for 30 days or more (2022 CGP Section III.G.)
- There is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a MS4 (2022 CGP Sections IV.O. and VI.Q.1)
- When deemed necessary by the QSD.

The QSD has determined that the changes listed below can be field determined by the QSP. All other changes will be made by the QSD as formal amendments to the SWPPP. Note that the 2022 CGP requires that the QSD revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations (2022 CGP, Section V.C.2.).

The following items shall be included in each amendment:

- Who requested the amendment
- The location of proposed change

- The reason for change
- The original BMP(s) proposed, if any
- The new BMP(s) proposed
- QSD certification.

SWPPP amendments shall be logged at the front of the SWPPP and SWPPP amendment QSD certifications kept in Appendix D. The SWPPP text shall be revised, replaced, and/or hand annotated as necessary to properly convey the amendment. SWPPP amendments must be made by a QSD.

The following changes have been designated by the QSD as "to be field determined" and constitute minor changes that the QSP may implement based on field conditions, and without the need for a SWPPP amendment:

- Increase quantity of an erosion or sediment control measures
- Relocate/add stockpiles or stored materials
- Relocate or add toilets
- Relocate vehicle storage and/or fueling locations
- Relocate areas for waste storage
- Relocate water storage and/or water transfer location
- Changes to access points (entrance/exits)
- Change type or location of erosion or sediment control measure
- Minor changes to schedule or phases
- Changes in construction materials

Any field changes not identified for field location or field determination by the QSP must be made as an amendment by the QSD.

2.4 Retention of Records

Paper or electronic records of documents required by this SWPPP shall be retained for a minimum of three years from the date generated or date submitted, whichever is later, for all items pertaining to the SWPPP program at the site (e.g., SWPPP, visual monitoring reports, sampling equipment calibration records, sampling field sheets, analytical laboratory reports, etc.).

These records shall be available at the Site until construction is complete. After the Project has closed and the Regional Water Board has approved the Notice of Termination (NOT), records shall be kept by the Legally Responsible Person. Records assisting in the determination of compliance with the 2022 CGP shall be made available within a reasonable time, to the Regional Water Board, State Water Board, or U.S. Environmental Protection Agency (EPA) upon request. Requests by the Regional Water Board for retention of records for a period longer than three years shall be adhered to.

2.5 Reporting

Completed inspection checklists are not required to be submitted to the Regional Water Board. However, completed inspection checklists will be kept with the SWPPP on Site or electronically. The 2022 CGP requires that permittees prepare, certify, and electronically submit an Annual Report no later than

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September 1 of each year. Reporting requirements are identified in 2022 CGP Section VI.P. Annual reports will be filed in SMARTS and in accordance with information required by the online forms.

Results of non-visible pollutant monitoring and corrective actions will be electronically submitted within 30 days after obtaining analytical results or within 10 days if the analytical results demonstrate the exceedance of a Basin Plan parameter. See Section 8 for additional discussion of the reporting requirements.

A NAL exceedance report will be prepared when requested, in writing, by the Regional Water Board.

If using an ATS, results of monitoring (i.e., pH, turbidity, flowrate, volume discharged, and freeboard storage) will be electronically submitted monthly during the Project. See the ATS Plan for additional discussion of the reporting requirements. In the event of an ATS numeric effluent limitation (NEL) exceedance, results will be electronically certified and submitted to SMARTS within 24 hours of obtaining the results.

The Regional Water Board will be notified via email 24 hours prior to the beginning of a planned dewatering discharge. In the event of an emergency dewatering, the Regional Water Board and applicable MS4 are to be notified within 24 hours of a discharge occurring. An emergency is defined as the need to protect human life and health or prevent severe property damage.

2.6 Required Non-Compliance Reporting

Planned changes in site construction activities that may result in non-compliance with the 2022 CGP are required to be provided in writing to the Regional Water Board and local stormwater agency in advance of the changes.
If a 2022 CGP discharge violation occurs, the QSP shall immediately notify the LRP. The LRP shall include information on the violation with the Annual Report. Corrective measures will be implemented immediately following identification of the discharge or written notice of non-compliance from the Regional Water Board. Discharges and corrective actions must be documented and include the following items:

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

2.7 Changes to Permit Coverage

The 2022 CGP allows for the reduction or increase of the total acreage covered under the 2022 CGP when: a portion of the Project is complete and/or conditions for termination of coverage have been met; ownership of a portion of the Project is purchased by a different entity; or new acreage is added to the Project.

Modified PRDs shall be filed electronically through a Change of Information (COI) 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 and logged at the front of the SWPPP. SWPPP amendments QSD certifications are located in Appendix D. COIs submitted electronically via SMARTS can be found in Appendix C. Updated PRDs submitted electronically via SMARTS can be found in Appendix E.

2.8 Notice of Termination

A NOT must be submitted electronically by the LRP or DAR via SMARTS to terminate coverage under the 2022 CGP. According to the requirements of 2022 CGP, Section III.H.4., the following final stabilization method will be used to satisfy final stabilization condition requirements (delete the 2 that are not applicable):

- 70 percent final cover method supported by pre- and post-Project photographs demonstrating stabilization.
- RUSLE or RUSLE2 method with computation proof supported by pre- and post-Project photographs demonstrating stabilization.
- Custom method for which Regional Water Board approval has been obtained, supported by documentation required by the Regional Water Board and pre- and post-Project photographs demonstrating stabilization.

The Contractor shall terminate CGP coverage of a site by uploading the appropriate information through SMARTS (see below). By uploading a NOT, the Contractor shall be certifying that construction activities are complete and that the Project is in full compliance with the requirements of the CGP. The Legally Responsible Person will review and approve the information submitted through SMARTS. The client, as LRP, will certify the NOT in SMARTS. The Regional Water Board will consider a construction site complete when the conditions of the 2022 CGP Section III.H. have been met.

The discharger is required to submit the following in SMARTS:

- NOT SMARTS Form
- QSP-prepared final NOT inspection which includes the QSP name and valid QSP certificate number
- Final Site Map with photo orientation references
- Photos demonstrating final stabilization and the applicable post-construction BMPs and/or low impact development
- A long-term maintenance plan for the post-construction stormwater runoff BMPs and/or low impact development features being implemented.

According to the 2022 CGP, the NOT will be automatically approved within 30 calendar days after the date the NOT was submitted, unless within the 30 calendar days the Regional Water Board notifies the discharger through SMARTS that the NOT has been denied, returned, or accepted for review (2022 CGP, Section III.H.7). Upon approval by the Regional Water Board that permit coverage has been terminated, the information will be communicated to the Contractor.

If an Annual Report has not been filed in the current reporting year, an Annual Report will need to be submitted prior to the NOT.

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3.0 Project Information

3.1 Project and Site Description

3.1.1 Site Description

This Project comprises approximately 4.2 acres in total. The Site includes 1 acre of DSA along with paved and non-DSA laydown areas, and is located at 1640 Tidelands Avenue in National City, California, at Latitude 32°40'02.64"N and Longitude 117°06'58.32"W. The Project is situated within an industrial area near the Port of San Diego and is generally bounded by existing commercial and transportation infrastructure. The Project location is shown on the Site Vicinity Map and Site Location Map included in Appendix A.

The Project includes grading and utility trenching to support new site infrastructure, construction of improvements for ADA compliance, and development of a convenience store facility. In general, the work will include installation of underground utilities within designated trench alignments, construction of accessible pathways and associated site features, and installation of foundations and pylons to support a solar array in addition to electric vehicle charging stalls.

The primary civil scope for this Project is to perform grading, excavating and trenching for underground utilities, backfilling utility trenches, and installing foundations and pylons to support a solar array and electric vehicle charging stalls. Site improvements include the construction of accessible pathways and associated features to achieve Americans with Disabilities Act (ADA) compliance. New site infrastructure will also include development of a convenience store facility. All demolition, paving, and certain site preparation activities will be performed by other subcontractors. See Appendix A for approximate work area limits.

3.1.2 Existing Conditions

As of the initial date of this SWPPP, the Site is a fully developed industrial facility, encompassing approximately 4.2 acres within an 8.2-acre parcel. The area is primarily paved with asphalt, serving as an overflow and chassis storage facility. There are no structures on-site, and the Site is surrounded by commercial, industrial, and military land uses.

The underlying soil at the Site is designated as Huerhuero-Urban land complex, per the United States Department of Agriculture (USDA), Natural Resources Conservation Services (NRCS). No existing natural hydrologic features, such as watercourses, seeps, springs, or wetlands are present at the Site. No contaminated soils are known to exist on site.

3.1.3 Existing Drainage

The Site is generally level, with ground elevations ranging from approximately 10 to 13 feet above mean sea level (msl). Existing drainage directs stormwater runoff to offsite storm drain inlets, discharging into the Cities underground storm drainage system. Stormwater then eventually discharges downstream through an outfall into the San Diego Bay. Stormwater discharges from the Site are not considered direct discharges, as water from the Site travels through a series of conveyances and mixes with other runoff before entering the San Diego Bay. No offsite runoff is conveyed through the Site to the stormwater system. Existing site topography, drainage patterns, and stormwater conveyance systems are shown on the Site SWPPP Layout Figures in Appendix A.

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3.1.4 Geology and Groundwater

Soil data for the Project site was obtained from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey for San Diego County. The underlying soils at the Project site are primarily mapped as Huerhuero Urban Land Complex with 2 to 9 percent slopes, as well as areas classified as Made Land. Within the Huerhuero series, the upper 0 to 12 inches generally consist of loam, while the subsurface from approximately 12 to 55 inches is dominated by clay and clay. Beneath this, from approximately 55 to 72 inches, the soils transition to stratified sand to sandy loam. Urban Land areas consist of variable fill material within the upper 6 inches, and Made Land units also comprise variable, human altered soils extending to depths of 6 inches or more. It should be noted that NRCS soil survey datasets cover broad geographic areas, and soil conditions at the Project site may vary from the mapped classifications. Site specific soil conditions cannot be precisely defined without detailed geotechnical investigation.

Groundwater data for the Project site vicinity was obtained from the United States Geological Survey (USGS) monitoring well network in San Diego County. The referenced well is located just over a mile north of the Project with a land-surface elevation of 12.3 feet above NAVD88. Groundwater at this location has historically been recorded at shallow depths, approximately 7 to 10 feet below land surface, with some seasonal variation. The well is in the California Coastal Basin aquifer, which represents the primary groundwater-bearing formations in the region. Water level trends from 2006 to 2025 indicate fluctuations consistent with regional hydrologic conditions, but groundwater generally remains at less than 10 feet below grade. It should be noted that groundwater datasets represent conditions at monitored points and times. Localized depths and flow characteristics can vary significantly and site-specific groundwater conditions cannot be precisely defined without subsurface geotechnical investigation.

3.1.5 Project Description

The Project involves development of a 4.2-acre industrial site located at 1640 Tidelands Avenue in National City, California. Construction activities will include grading and trenching to install underground utilities, construction of accessible pathways and associated site improvements to meet ADA requirements, and installation of foundations and pylons to support a solar array with integrated electric vehicle charging stalls. All grading and trenching activities will result in approximately one acre of total DSA. The Project also includes construction of a convenience store facility and designated laydown and staging areas to support operations. Upon completion, the Site will feature an infiltration basin designed to manage post-construction stormwater runoff in accordance with applicable regulatory requirements.

3.1.6 Developed Condition

The proposed site improvements will include a surface biofiltration basin located on the east side of the project. Flows will be conveyed via sheet flow to the basin where stormwater will be treated through a combination of soil and plant media prior to being picked up by an underdrain system and discharged to the existing storm drain main located in Tidelands Ave. Table 3-1 provides estimates for preconstruction and post construction DSA metrics.

Table 3-1 Construction Site Estimates

Construction site area	4.2	acres
Total area of soil disturbance	1.0	acres
Percent impervious before construction	100	%
Runoff coefficient before construction	0.95	
Percent impervious after construction	95	%
Runoff coefficient after construction	0.25	

3.2 Permits and Governing Documents

In addition to the 2022 CGP, the following documents have been considered while preparing this SWPPP:

- Regional Water Board requirements
- San Diego Area MS4 NPDES Permit Order No. R9-2013-0001, as amended by R9-2015-0001
- Basin Plan requirements
- Contract documents

3.3 Stormwater Run-On from Off-Site Areas

Run-on to the Site may occur from upgradient non-point source discharges, such as stormwater runoff from neighboring sites. The 2022 CGP requires that temporary BMPs be implemented to direct off-site run-on away from disturbed areas through the use of runoff controls.

3.4 Findings of the Construction Site Sediment and Receiving Water Risk Determination

A construction site risk assessment has been performed for the Project, and the resultant risk level is Risk Level 1.

To obtain the R Factor used in risk assessment calculations, EPA's Rainfall Erosivity Factor Calculator was used. The K Factor and LS Factor were also obtained using EPA's online mapping tool. Risk level is based on Project duration, location, proximity to impaired receiving waters, and soil conditions. Individual calculations are included in Appendix A. A copy of the Risk Level determination submitted on SMARTS with the PRDs is included in Appendix C.

Table 3-2 and Table 3-3 provide summaries of the sediment risk factors and receiving water risk factors, respectively, and identify the information sources used to determine these factors.

Table 3-2 Summary of Sediment Risk

RUSLE Factor	Value	Method for Establishing Value
R	27	EPA Website
K	0.32	EPA Website
LS	0.82	EPA Website
Total Predicted Sediment Loss (tons/acre)		7.08

Overall Sediment Risk Low Sediment Risk < 15 tons/ acre Medium Sediment Risk >= 15 and < 75 tons/acre High Sediment Risk >= 75 tons/acre	☒ **Low** ☐ **Medium** ☐ **High**

Stormwater discharges from the Site are not considered direct discharges, as water from the Site travels through a series of conveyances and mixes with other runoff before entering the San Diego Bay.

Table 3-3 Summary of Receiving Water Risk

Receiving Water Name	**303(d) Listed for Sediment Related Pollutant**	**TMDL for Sediment Related Pollutant**	**Beneficial Uses of Cold, Spawn, and Migratory**
San Diego Bay	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Overall Receiving Water Risk			☒ **Low** ☐ **High**

Risk Level 1 sites are subject to the narrative effluent limitations specified in the 2022 CGP and may be subject to numeric effluent limits for applicable dewatering activities, ATSs, and passive treatment systems used on site. The narrative effluent limitations require stormwater discharges associated with construction activity to minimize or prevent pollutants in stormwater and authorized non-stormwater through the use of controls, structures, and BMPs. This SWPPP has been prepared to address Risk Level 1 requirements (2022 CGP Attachment D).

3.5 Threat to Water Quality

Discharges from the Project site will enter the local municipal storm drain system, where they will comingle with other urban runoff prior to discharging into San Diego Bay. The primary pollutant of concern for this Project is sediment generated during construction activities. No other significant pollutant sources have been identified.

San Diego Bay is listed as an impaired waterbody under Section 303(d) of the Clean Water Act; however, it is not listed as impaired for sediment-related pollutants.

3.6 Construction Schedule

The Site sediment risk was determined based on construction taking place between August 2026 and May 2027. Modification or extension of the schedule (start and end dates) may affect risk determination and permit requirements. The Construction Manager, Superintendent or LRP shall contact the QSD if the schedule changes during construction to address potential impact to the SWPPP. The estimated schedule for planned work can be found in Appendix F.

The 2022 CGP recognizes five distinct phases of construction:

- Demolition and Pre-Development Site Preparation Phase
- Grading and Land Development Phase
- Streets and Utilities Phase
- Vertical Construction Phase
- Final Landscaping and Site Stabilization Phase.

Each phase has activities that can result in different water quality effects from different water quality pollutants. The following describes how the schedule will be used during construction to:

1. Minimize and/or avoid grading in the wet season
2. Minimize areas to be cleared and graded to only those portions of the Site where it is deemed necessary for construction
3. Minimize the length of time soil will be disturbed and/or exposed during each phase of the Project

3.7 Potential Construction Activity and Pollutant Sources

The 2022 CGP states that the primary stormwater pollutant at construction sites is excess sediment. Scheduling and the extent of disturbed/exposed soil area are significant factors affecting erosion. The maximum extent of disturbed soil area (DSA) during each phase of the Project is as follows:

- Demolition and Pre-Development Site Preparation Phase: Maximum DSA is 1 acre
- Grading and Land Development Phase: Maximum DSA is 1 acre
- Streets and Utilities Phase: Maximum DSA is 1 acre
- Vertical Construction Phase: Maximum DSA is 1 acre
- Final Landscaping and Site Stabilization Phase: Maximum DSA is 1 acre

Table 3-4 lists construction activities and associated materials that are anticipated to be used on site. These activities and associated materials will or could potentially contribute pollutants, other than sediment, to stormwater runoff.

Table 3-4 Construction Activities and Associated Materials

Check All That Apply	General Work Activity/ Products With Potential Stormwater Pollutants	Specific Work Activity/Products with Potential Stormwater Pollutants	Pollutant Categories
X	Adhesives	Adhesives, glues, resins, epoxy synthetics, PVC cement Caulks, sealers, putty, sealing agents and Coal tars (naphtha, pitch)	Oil and Grease, Synthetic Organics[1]
X	Asphalt paving/curbs	Hot and cold mix asphalt	Oil and Grease
	Cleaners	Polishes (metal, ceramic, tile) Etching agents Cleaners, ammonia, lye, caustic sodas, bleaching agents and chromate salts	Metals, Synthetic Organics
X	Concrete / Masonry	Cement and brick dust Colored chalks Concrete curing compounds Glazing compounds Surfaces cleaners Saw cut slurries Tile cutting	Metals, Synthetic Organics

Check All That Apply	General Work Activity/ Products With Potential Stormwater Pollutants	Specific Work Activity/Products with Potential Stormwater Pollutants	Pollutant Categories
X	Drywall	Saw-cutting drywall	Metals
X	Framing/Carpentry	Sawdust, particle board dust, and treated woods Saw cut slurries	Metals, Synthetic Organics
	Heating, Ventilation, Air Conditioning	Demolition or construction of air condition and heating systems	Metals, Synthetic Organics
	Insulation	Demolition or construction involving insulation, venting systems	Metals, Synthetic Organics
	Liquid waste	Wash waters Irrigation line testing/flushing	Metals, Synthetic Organics
X	Painting	Paint thinners, acetone, methyl ethyl ketone, stripper paints, lacquers, varnish, enamels, turpentine, gum spirit, solvents, dyes, stripping pigments and sanding	Metals, Synthetic Organics
	Planting / Vegetation Management	Vegetation control (pesticides/herbicides) Planting Plant maintenance Vegetation removal	Nutrients, Metals, Synthetic Organics
X	Plumbing	Solder (lead, tin), flux (zinc chloride), pipe fitting Galvanized metal in nails, fences, and electric wiring	Metals, Synthetic Organics
	Pools/fountains	Chlorinated water	Synthetic Organics
X	Removal of existing structures	Demolition of asphalt, concrete, masonry, framing, roofing, metal structures.	Metals, Oil and Grease, Synthetic Organics
X	Roofing	Flashing Saw cut slurries (tile cutting) Shingle scrap and debris	Metals, Oil and Grease, Synthetic Organics
X	Sanitary waste	Portable toilets Disturbance of existing sewer lines.	Nutrients
	Soil preparation/amendments	Use of soil additives/amendments	Nutrients
X	Solid waste	Litter, trash and debris Vegetation	Gross Pollutants
X	Utility line testing and flushing	Hydrostatic test water Pipe flushing	Synthetic Organics
X	Vehicle and equipment use	Equipment operation Equipment maintenance Equipment washing Equipment fueling	Oil and Grease

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1. Synthetic Organics are defined in Table 1.2 of the CASQA *Stormwater BMP Handbook Portal: Construction* as adhesives, cleaners, sealants, solvents, etc. These are generally categorized as volatile or semi-volatile organic compounds.

The anticipated activities and associated pollutants were used in Section 4 to select the BMPs for the Project. Locations of anticipated pollutants and associated BMPs are shown on the Site Maps in Appendix G.

3.8 TMDL Requirements

Based on the Project's receiving water and the pollutant source assessment, 2022 CGP TMDL requirements are not applicable to this Project.

3.9 Identification of Non-Stormwater Discharges

Non-stormwater discharges consist of discharges which do not originate from precipitation events.

Non-stormwater discharges into storm drainage systems or waterways that are not authorized under the 2022 CGP and listed in the SWPPP (Section 4), or authorized under a separate NPDES permit, are prohibited.

Non-stormwater discharges that are authorized from this Project site include the following:

- None

These authorized non-stormwater discharges will be managed with the stormwater and non-stormwater BMPs described in Section 4 of this SWPPP and will be minimized under the direction of the QSP.

Activities at this site that may result in unauthorized non-stormwater discharges include:

- None

Steps will be taken, including the implementation of appropriate BMPs, to ensure that unauthorized discharges are eliminated, controlled, disposed, or treated on site.

Discharges of construction materials and wastes, such as fuel or paint, resulting from dumping, spills, or direct contact with rainwater or stormwater runoff, are also prohibited.

3.10 Required Site Map Information

The construction Project's Site Map(s) showing the Project location, surface water boundaries, geographic features, construction site perimeter and general topography, locations of storm drain inlets that receive runoff from the Project, and other requirements identified in Sections IV.O.2. k. and l of the 2022 CGP through each phase of construction are located in Appendix B. Table 3-5, Table 3-6, Table 3-7, and Table 3-8 identify Map or Sheet Nos. where required elements are illustrated.

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Table 3-6 Required Map Information for Streets and Utilities Phase

Table 3-5 Required Map Information for Grading and Land Development Phase

Included on Map/Plan Sheet No. (1)	Required Element
Pre-Earthwork Drawings - The Project's surrounding area (vicinity)	
CG102-A	Site and Project boundaries
N/A	Areas disturbed during geotechnical or other preconstruction investigation work
CG102-A	Existing roads and trails
N/A	Drainage areas
N/A	Discharge locations
N/A	Existing storm drain system if applicable
N/A	Proposed locations of storage areas for waste
N/A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans) including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Sampling locations
CG102-A	Areas of soil disturbance (temporary or permanent)
CG102-A	Proposed active areas of soil disturbance (cut or fill)
N/A	Proposed locations of erosion control BMPs
CG102-A	Proposed locations of sediment control BMPs
CG102-A	Proposed locations of run-off BMPs
N/A	Temporary and/or permanent run-on conveyance (if applicable)
N/A	Proposed locations of active treatment systems(s) (if applicable)
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)

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Included on Map/Plan Sheet No. (1)	Required Element
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
CG102-A	Site-specific procedures to implement final stabilization BMPs as soon as reasonably practicable

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Table 3-6 Required Map Information for Streets and Utilities Phase

Included on Map/Plan Sheet No. (1)	Required Element
Pre-Earthwork - The Project's surrounding area (vicinity)	
CG102-A	Site and Project boundaries
N/A	Areas disturbed during geotechnical or other preconstruction investigation work
CG102-A	Existing roads and trails
N/A	Drainage areas
N/A	Discharge locations
N/A	Existing storm drain system, if applicable
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans), including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Sampling locations
CG102-A	Areas of soil disturbance (temporary or permanent)
CG102-A	Proposed active areas of soil disturbance (cut or fill)
N/A	Proposed locations of erosion control BMPs
CG102-A	Proposed locations of sediment control BMPs
CG102-A	Proposed locations of run-off BMPs
N/A	Temporary and/or permanent run-on conveyance (if applicable)
N/A	Proposed locations of active treatment systems(s) (if applicable)
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
N/A	Proposed locations of loading/unloading materials
N/A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control

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Table 3-6 Required Map Information for Streets and Utilities Phase

Included on Map/Plan Sheet No. (1)	Required Element
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
CG102-A	Site-specific procedures to implement final stabilization BMPs as soon as reasonably practicable

1. Indicates maps or drawings that information is included on (e.g., Vicinity Map, Site Map, Drainage Plans, Grading Plans, Progress Maps, etc.)

Table 3-7 Required Map Information for Vertical Construction Phase

Included on Map/Plan Sheet No. (1)	Required Element
Pre-Earthwork Drawings - The Project's surrounding area (vicinity)	
CG102-A	Site and Project boundaries
N/A	Areas disturbed during geotechnical or other preconstruction investigation work
CG102-A	Existing roads and trails
N/A	Drainage areas
N/A	Discharge locations
N/A	Existing storm drain system if applicable
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans), including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Existing storm drain system, if applicable
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
N/A	Proposed locations of loading/unloading materials

Included on Map/Plan Sheet No. (1)	Required Element
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
CG102-A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans), including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Sampling locations
CG102-A	Areas of soil disturbance (temporary or permanent)
CG102-A	Proposed active areas of soil disturbance (cut or fill)
N/A	Proposed locations of erosion control BMPs
CG102-A	Proposed locations of sediment control BMPs
CG102-A	Proposed locations of run-off BMPs
N/A	Temporary and/or permanent run-on conveyance (if applicable)
N/A	Proposed locations of active treatment systems(s) (if applicable)
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
CG102-A	Site-specific procedures to implement final stabilization BMPs as soon as reasonably practicable

1. Indicates maps or drawings that information is included on (e.g., Vicinity Map, Site Map, Drainage Plans, Grading Plans, Progress Maps, etc.)

Table 3-8 Required Map Information for Final Landscaping and Site Stabilization Phase

Included on Map/Plan Sheet No. (1)	Required Element
Pre-Earthwork Drawings - The Project's surrounding area (vicinity)	
CG102-A	Site and Project boundaries
N/A	Areas disturbed during geotechnical or other preconstruction investigation work
CG102-A	Existing roads and trails
N/A	Drainage areas
N/A	Discharge locations

Included on Map/Plan Sheet No. (1)	Required Element
N/A	Existing storm drain system if applicable
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans), including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Existing storm drain system, if applicable
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
N/A	Proposed locations of loading/unloading materials
CG102-A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
Construction and Earthwork Drawing(s) - The Project's surrounding area (vicinity)	
CG102-A	Site layout (grading plans), including roads
CG102-A	Site and Project boundaries
N/A	Drainage areas
N/A	Discharge locations
N/A	Sampling locations
CG102-A	Areas of soil disturbance (temporary or permanent)
CG102-A	Proposed active areas of soil disturbance (cut or fill)
N/A	Proposed locations of erosion control BMPs
CG102-A	Proposed locations of sediment control BMPs
CG102-A	Proposed locations of run-off BMPs
N/A	Temporary and/or permanent run-on conveyance (if applicable)

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Included on Map/Plan Sheet No. (1)	Required Element
N/A	Proposed locations of active treatment systems(s) (if applicable)
CG102-A	Proposed locations of storage areas for waste
CG102-A	Proposed locations of construction materials
CG102-A	Proposed locations of Project staging areas
N/A	Proposed locations of stockpiles
N/A	Proposed locations of vehicles, equipment staging, and vehicle maintenance
CG102-A	Proposed locations of loading/unloading materials
N/A	Proposed locations of site access (entrance/exits)
N/A	Proposed locations of fueling, water storage, water transfer for dust control
N/A	Proposed locations of demolition
N/A	Proposed locations of other construction support activities
CG102-A	Site-specific procedures to implement final stabilization BMPs as soon as reasonably practicable

1. Indicates maps or drawings that information is included on (e.g., Vicinity Map, Site Map, Drainage Plans, Grading Plans, Progress Maps, etc.)

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4.0 Best Management Practices

4.1 Schedule for BMP Implementation

A BMP implementation schedule must be developed to ensure the following:

- The maximum DSA is not exceeded
- Deployment of physical or vegetation erosion control BMPs are deployed as soon as grading or excavation has been completed for any portion of the site
- Slopes are stabilized prior to a Precipitation Event
- Pre-existing soil contamination issues are addressed appropriately and safely.

The Construction BMP implementation schedule must be updated as site changes occur. Table 4-1 is the tentative schedule for BMP implementation.

Table 4-1 BMP Implementation Schedule

	BMP	Location	Implementation	Duration
Erosion Control BMPs	EC-1, Scheduling		Prior to Construction	Project duration
	EC-7, Geotextiles and Mats		When stockpiling occurs on site	Project duration
	EC-15, Soil Preparation-Roughening		When soil is not stabilized and subject to stormwater runoff	Prior to installing BMPs
	EC-16, Non-Vegetated Stabilization		When soil is not stabilized and subject to stormwater runoff	Project duration
Sediment Control BMPs	SE-1, Silt Fence		In locations where stormwater runoff may sheet flow	Project duration
	SE-7, Street Sweeping		When dust and dirt accumulation reaches a point where it may contribute negatively to stormwater discharge	As needed
	SE-10, Storm Drain Inlet Protection		When sediments & pollutants have the potential to enter storm drains	Project duration
Wind Erosion Control BMPs	WE-1, Wind Erosion Control		When soil is not stabilized and subject to wind erosion	Project duration
Tracking Control BMPs	TC-1, Stabilized Construction Entrance and Exit		During construction at all entrances and exits to the site	Project duration
Non-Stormwater BMPs	NS-1, Water Conservation Practices		During any activities where there is potential for excess watering or runoff	Project duration

	BMP	Location	Implementation	Duration
	NS-3, Paving and Grinding Operation		During Ac or PCC saw-cutting operations	Project duration
	NS-6, Illicit connection/Discharge		When there is potential for illicit connections/ discharges	Project duration
	NS-9, Vehicle and Equipment Fueling		During equipment refueling	Project duration
	NS-12, Concrete Curing		During concrete curing & finishing	During Concrete curing & finishing
	NS-13, Concrete Finishing			
Construction Material Control BMPs	WM-01, Material Delivery and Storage		When there is potential for stormwater contact with construction materials	Project duration
	WM-02, Material Use			Project duration
	WM-03, Stockpile Management		When soil is stockpiled onsite	Project duration
	WM-04, Spill Prevention and Control		When any chemical and/or hazardous substance is used or stored onsite	Project duration
Waste Management Control BMPs	WM-05, Solid Waste Management		When there is potential for stormwater contact with construction and waste materials	Project duration
	WM-08, Concrete Waste Management		When concrete waste is generated	Project duration
	WM-09, Sanitary-Septic Waste Management		When managing temporary and portable Sanitary/septic waste at the Project site.	Project duration

4.2 Limitations on the Extent of Disturbed Soil Area (DSA)

Excess sediment is the primary stormwater pollutant at construction sites, and it is usually easier and less expensive to prevent erosion than it is to control sedimentation. Scheduling and limitations on the extent of disturbed/exposed soil are significant factors in controlling erosion at construction sites.

Described below is the extent of the maximum DSA during each phase of the Project and the measures that will be put in place during each phase to ensure that the maximum DSA is not exceeded:

- **Demolition and Pre-Development Site Preparation Phase**

Maximum DSA is 1 acre; Measures that will be put in place to ensure that the maximum DSA is not exceeded:

Subcontractors will strictly adhere to site plans to ensure minimum DSA.

- **Grading and Land Development Phase**

Maximum DSA: 1 acre; Measures that will be put in place to ensure that the maximum DSA is not exceeded:

Subcontractors will strictly adhere to site plans to ensure minimum DSA.

- **Streets and Utilities Phase**

Maximum DSA: 1 acre; Measures that will be put in place to ensure that the maximum DSA is not exceeded:

Subcontractors will strictly adhere to site plans to ensure minimum DSA.

- **Vertical Construction Phase**

Maximum DSA: 1 acre; Measures that will be put in place to ensure that the maximum DSA is not exceeded:

Subcontractors will strictly adhere to site plans to ensure minimum DSA.

- **Final Landscaping and Site Stabilization Phase**

Maximum DSA: 1 acre; Measures that will be put in place to ensure that the maximum DSA is not exceeded:

Subcontractors will strictly adhere to site plans to ensure minimum DSA.

4.3 Erosion and Sediment Control

Erosion and sediment controls are required by the 2022 CGP to provide effective reduction or elimination of sediment-related pollutants in stormwater discharges and authorized non-stormwater discharges from the Site. Erosion control is to be used as the most important measure for reducing sediment discharge from a construction site, but never as the single method. Sediment controls should also be used a supplement to erosion controls. There must be an effective combination of both erosion and sediment control on site. BMPs at each construction site are site-specific, seasonally appropriate, construction phase appropriate, and implemented year-round. Applicable BMPs are identified in this section for erosion control, sediment control, tracking control, and wind erosion control.

4.3.1 Erosion Controls

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

Erosion Control BMPs will be installed and maintained year-round. Erosion control BMPs will be deployed as soon as grading and/or excavation have been completed. All slopes will be protected and stabilized prior to precipitation events. Inactive areas will be fully protected from erosion if left idle for more than 14 days. Sufficient quantities of additional stock of BMP materials will be stored on site to completely protect exposed portions of the Site.

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

1. Implement effective wind erosion control.
2. Preserve existing vegetation where required and when feasible.

3. The area of soil disturbing operations shall be controlled such that subcontractors are able to implement erosion control BMPs quickly and effectively.
4. Stabilize non-active areas within 14 days of cessation of construction activities or sooner if stipulated by local requirements.
5. Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding or alternate methods.
6. Prior to the completion of construction, apply permanent erosion control to remaining disturbed soil areas.

Sufficient erosion control materials should be maintained on site to allow implementation in conformance with this SWPPP. Construction Projects with stormwater runoff discharging directly to San Diego Bay must use high performance erosion control methods, such as bonded fiber matrix or anchored erosion control blankets, on exposed soils, until those soils are stabilized or are no longer exposed.

Steps should be taken to ensure that there are no concentration points that could scour soil or overwhelm the erosion control measures. Table 4-2 lists the BMPs that shall be implemented to control erosion on the construction site. BMP Fact Sheets for temporary erosion control BMPs are provided in Appendix H.

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Table 4-2 Temporary Erosion Control BMPs

CASQA Fact Sheet	BMP Name	Minimum BMP Required for All Projects	Minimum BMP Required for Projects Discharging Directly to San Diego Bay	BMP Used [1]	If BMP Is Not Used, State Reason
EC-1	Scheduling	X	X	Yes	
EC-2	Preservation of Existing Vegetation			No	No vegetation exists in Project area
EC-3	Hydraulic Mulch [2]		X	No	Not applicable
EC-4	Hydroseed [2]		X	No	Not utilized in landscaping area
EC-5	Soil Binders [2]		X	No	Not applicable
EC-6	Straw Mulch [2]			No	No vegetation to be placed in Project area
EC-7	Geotextiles and Mats [2]		X	Yes	
EC-8	Wood Mulching [2]		X	No	Not applicable
EC-9	Earth Dike and Drainage Swales [3]			No	No runoff diversion necessary
EC-10	Velocity Dissipation Devices			No	No channels or outlets in Project area
EC-11	Slope Drains			No	No slopes in Project area
EC-12	Stream Bank Stabilization			No	No stream banks in Project area
EC-14	Compost Blankets [2]		X	No	No vegetation to be placed in Project area
EC-15	Soil Preparation-Roughening	X	X	Yes	
EC-16	Non-Vegetated Stabilization [2]	X	X	Yes	
WE-1	Wind Erosion Control	X	X	Yes	
	Alternate BMPs Used:				**If Used, State Reason:**

1. The 2022 CGP Fact Sheet, Section I.R.1.d through I.R.1.i, describes various BMPs that should be considered for use on the construction site. Applicability to a specific Project shall be determined by the QSD.
2. The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the performance requirements of the CGP for Projects discharging directly to San Diego Bay.
3. Run-on from off-site shall be directed away from all disturbed areas, diversion of off-site flows may require design/analysis by a licensed civil engineer and/or additional environmental permitting.

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These temporary erosion control BMPs shall be implemented in conformance with the following guidelines and as outlined in the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Maps will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site-specific details in the Site Maps prevail over standard details included in the Site Maps. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

Scheduling

Project activities will be sequenced and coordinated to minimize the duration of disturbances to soil; equipment removal will begin as soon as possible after the existing pavement is removed. The total time during which soil is open to potential stormwater infiltration is limited to a few months.

- EC-1, Scheduling
  Contractor shall reduce the discharge of pollutants to storm drain facilities or water courses caused by construction activities by scheduling said activities in a manner that will limit exposure of disturbed soil to wind, rain, and stormwater run-on and run-off. Specifically, removal of existing Portland concrete cement (PCC) shall not occur within 48 hours prior to a Qualifying Precipitation Event (QPE) event of 50% or greater likelihood. Weather forecasts should be referenced from https://www.noaa.gov/

Geotextiles and Mats

- EC-7, Geotextiles and Mats
  If stockpiling of soils is to occur onsite, there may be a need to use plastic sheeting or other cover material as a temporary erosion control measure. This is especially true if contaminated soils are encountered during the Project or if a QPE is predicted to occur. The use of plastic is acceptable; however, the Contractor shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the Contractor shall consider the use of plastic materials resistant to solar degradation.

Soil Preparation-Roughening

- EC-15, Soil Preparation-Roughening
  Soil preparation and roughening will be used as necessary to prevent erosion of soils on slopes such as stockpiles, prior to installing BMPs, or as necessary to break up sheet flow.

Non-Vegetated Stabilization

- EC-16, Non-vegetated Stabilization
  In the event of unanticipated Project delays or other conditions, Contractor or its subcontractors may apply a gravel mulch composed of washed and screened coarse to very coarse gravel, 16 mm to 64 mm (0.6” - 2.5”), similar to AASHTO No. 3 coarse aggregate. This gravel mulch shall completely cover all exposed soil surfaces with a minimum 2” depth.

Wind Erosion Control

- WE-1, Wind Erosion Control
  Subcontractors shall apply water to actively disturbed soil areas to prevent wind-blown soil or debris from leaving the active work site or laydown and stockpile areas.

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4.3.2 Sediment Controls

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

Projects that do discharge to the bay must implement at least two independent sediment control measures at inlets, use linear sediment controls along slopes, and prevent concentrated flow that could cause erosion or overwhelm controls. This Project will not be directly discharging into the San Diego Bay.

Table 4-3 lists the BMPs that shall be implemented to control sediment on the construction site. Fact Sheets for temporary sediment control BMPs are provided in Appendix H.

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Table 4-3 Temporary Sediment Control BMPs

CASQA Fact Sheet	BMP Name	Minimum BMP Required for All Projects	Minimum BMP Required for Projects Discharging Directly to San Diego Bay	BMP Used [1]	If BMP Is Not Used, State Reason
SE-1	Silt Fence [2] [3]	X		Yes	
SE-2	Sediment Basin		X	No	Not applicable
SE-3	Sediment Trap		X	No	Not applicable
SE-4	Check Dams		X	No	Not applicable
SE-5	Fiber Rolls [2] [3]	X	X	Yes	SE-5 used in place
SE-6	Gravel Bag Berms [3]	X	X	No	SE-5 used in place
SE-7	Street Sweeping	X	X	Yes	
SE-8	Sandbag Barrier			No	Optional
SE-10	Storm Drain Inlet Protection[4]	X	X	Yes	As needed
SE-11	ATS			No	Not applicable
SE-12	Manufactured Linear Sediment Controls			No	Optional
SE-13	Compost Sock and Berms [3]	X	X	No	SE-5 used in place
SE-14	Biofilter Bags [3]			No	SE-5 used in place
TC-1	Stabilized Construction Entrance and Exit	X	X	Yes	
TC-2	Stabilized Construction Roadway			No	All roadways are paved
TC-3	Entrance Outlet Tire Wash			No	Rumble plates will be used
	Alternate BMPs Used:				**If Used, State Reason:**

1. The 2022 CGPs Fact Sheet, Section I.R.1.d through I.R.1.i, describes various BMPs that should be considered for use on the construction site. Applicability to a specific Project shall be determined by the QSD.
2. The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the performance requirements of the CGP for Projects discharging directly to San Diego Bay
3. Projects discharging directly to San Diego Bay. shall provide linear sediment control along toe of slope, face of slope, and at the grade breaks of exposed slope
4. Projects discharging directly to San Diego Bay must ensure that there are at least two lines of defense for sediment controls for discharges flowing to any inlet from the Project site and that each line of defense is designed to independently control sediment to the maximum extent practicable

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These temporary sediment control BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Maps will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site-specific details in the Site Maps prevail over standard details included in the Site Maps. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

Silt Fences

- SE-1, Silt Fences
  Subcontractors will utilize silt fences, as necessary, along the perimeter of the Site, around operational storm drains, at the end of a downward slope, or around temporary stockpiles. Silt fences can intercept sediment in runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. Silt fences have a limited usable lifespan and should be replaced as soon as they are ineffective.

Fiber Rolls

- SE-5, Fiber Rolls
  Subcontractors will utilize fiber rolls, as necessary, along the perimeter of the Site, at the toe and top of slopes, along contours, or around temporary stockpiles. Fiber rolls can intercept and slow runoff, reduce its flow velocity, promote sediment deposition, and provide filtration of sediment from the runoff. Fiber rolls have a limited usable lifespan and should be replaced or supplemented as soon as they are no longer functioning effectively.

Street Sweeping

- SE-7, Sediment Sweeping and Vacuuming
  Subcontractors will implement sediment sweeping and vacuuming, as necessary, to control sediment that is tracked from the Site onto public or private roads. This will limit the amount of sediment that may be transported to storm drains or watercourses. Sweeping/vacuuming equipment will meet the requirements of the San Diego Air Pollution Control District for dust and engine emissions control.

Storm Drain Inlet Protection

- SE-10, Storm Drain Inlet Protection

  All inlets within the work areas will be protected from sediment and other pollutants using gravel bag barriers, filter fabric, or fiber rolls. The area behind the gravel bags will collect and hold runoff so that suspended sediments settle out. Subcontractors will remove this sediment periodically during the rainy season, and especially after heavy rains. Gravel bags that become clogged with sediment will be replaced as necessary to ensure the free flow of water. Care should be taken as not to create a flooding condition.

  Inlets will also need to be protected from any grinding, sandblasting, and demolition operations. Any air-borne debris from these operations can settle into any surrounding inlets. Therefore, these inlets need to be completely covered with bags or with a plastic medium. This blockage must be removed anytime grinders are to be used.

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4.4 Non-Stormwater Controls and Waste and Materials Management

Non-stormwater discharges into storm drainage systems or waterways, which are not authorized under the 2022 CGP, are prohibited. Non-stormwater discharges for which a separate NPDES permit is required by the local Regional Water Board are prohibited unless coverage under the separate NPDES permit has been obtained for the discharge. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in Section 3.9 of this SWPPP.

Table 4-4 lists the BMPs that shall be implemented to control non-stormwater discharges on the construction site. Fact Sheets for temporary non-stormwater control BMPs are provided in Appendix H.

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Table 4-4 Temporary Non-Stormwater BMPs

CASQA Fact Sheet	BMP Name	Minimum BMP Required for All Projects	BMP Used? (1)	If Not Used, State Reason
NS-1	Water Conservation Practices	X	Yes	
NS-2	Dewatering Operation		No	Not Applicable
NS-3	Paving and Grinding Operation	X	Yes	
NS-4	Temporary Stream Crossing		No	Not Applicable
NS-5	Clear Water Diversion		No	Run-on directed to storm drain inlets
NS-6	Illicit Connection/Discharge	X	Yes	
NS-7	Potable Water/Irrigation		No	No potable water or irrigation discharges anticipated
NS-8	Vehicle and Equipment Cleaning		No	Vehicles and equipment will be cleaned at an offsite location
NS-9	Vehicle and Equipment Fueling	X	Yes	
NS-10	Vehicle and Equipment Maintenance		No	Vehicle and equipment maintenance will be performed at an offsite location
NS-11	Pile Driving Operation		No	No piles associated with the Project
NS-12	Concrete Curing	X	Yes	
NS-13	Concrete Finishing	X	Yes	
NS-14	Material and Equipment Use Over Water		No	Not Applicable
NS-15	Demolition Removal Adjacent to Water		No	Not Applicable
NS-16	Temporary Batch Plants		No	Not Applicable
Alternate BMPs Used:			**If Used, State Reason:**	

1. Applicability to a specific Project shall be determined by the QSD

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Non-stormwater BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Maps will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site-specific details in the Site Maps prevail over standard details included in the Site Maps. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

Water Conservation Practices

- NS-1, Water Conservation Practices
  Subcontractors shall implement water conservation practices when water is used. Irrigation areas shall be inspected, and watering schedules shall be adjusted to prevent erosion, excess watering, or runoff. Subcontractors shall shut off the water source to broken lines, sprinklers, or valves and they shall be repaired as soon as possible. When possible, water from waterline flushing shall be reused for landscape irrigation. Paved areas shall be swept and vacuumed, not washed with water.

  Construction water runoff shall be directed to areas to infiltrate into the ground and shall not be allowed to enter storm drain systems or watercourses. Spilled water shall not be allowed to escape water truck filling areas. When possible, subcontractors shall direct water from offsite sources around the Site or shall minimize contact with the Site.

Paving and Grinding Operation

- NS-3, Paving and Grinding Operations
  Subcontractors will implement BMP NS-3 during any AC or PCC saw-cutting operations. Paving and saw-cutting operations shall not occur 48 hours prior to or during any forecast precipitation event.

  This Project will periodically require saw-cutting operations. BMP WM-8, Concrete Waste Management, will be implemented to contain and dispose of saw-cutting slurries. If vacuuming is insufficient to contain the slurry and prevent discharge to the storm drain system, sandbags will be used as necessary. The slurry will be vacuumed and discharged to the concrete washout facility. Dried and cured concrete waste will be disposed of offsite during concrete washout maintenance activities.

Illicit Connection/Discharge

- NS-6, Illicit Connection/Discharge
  Subcontractors will implement BMP NS-6, Illicit Connection/Discharge throughout the duration of the Project. Accidental discharges will be cleaned up immediately. Illicit discharges by the Subcontractors' operations will not be allowed. Illicit discharges by others will be reported to the appropriate authorities.
- NS-9, Vehicle and Equipment Fueling
  Subcontractors will implement BMP NS-9, Vehicle and Equipment Fueling throughout the duration of the Project. When practical, equipment will be refueled offsite to minimize potential impact to stormwater. Fuel will be enclosed or covered when in storage and spill controls will be used if an accidental spill occurs. Absorbent spill materials and spill kits will be available on fueling trucks and in fueling areas.

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- NS-10, Vehicle and Equipment Maintenance
  Subcontractors will implement BMP NS-10, Vehicle and Equipment Maintenance, as needed. When practical, maintenance activities will be conducted offsite to minimize potential stormwater impacts. Maintenance areas will be designated, contained, and located away from drainage pathways. Drip pans or absorbent materials will be used to capture leaks or spills, and spill kits will be readily available at maintenance locations.

Concrete Curing, Concrete Finishing

- NS-12, Concrete Curing; NS-13, Concrete Finishing
  Subcontractors will utilize BMPs NS-12 and NS-13 during curing and concrete finishing activities. Subcontractors will use only pigmented curing compounds to ensure clarity in monitoring for non-visible pollutants. Concrete curing materials shall be covered when not in use. Leaks or spills of concrete curing materials that are not fully cleaned or removed may require discharge sampling during subsequent precipitation events.

4.4.1 Materials Management and Waste Management

Materials management control practices consist of implementing procedural and structural BMPs for handling, storing and using construction materials to prevent the release of those materials into stormwater discharges. The amount and type of construction materials to be utilized at the Site will depend upon the type of construction and the length of the construction period. The materials may be used continuously, such as fuel for vehicles and equipment, or for a discrete period, such as soil binders for temporary stabilization.

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

Project sites with pre-existing soil contamination issues must implement contaminated soil management BMPs.

Materials and waste management pollution control BMPs shall be implemented to minimize stormwater contact with construction materials, wastes and service areas; and to prevent materials and wastes from being discharged off site. The primary mechanisms for stormwater contact that shall be addressed include:

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

Construction Projects with stormwater runoff discharging directly to San Diego Bay must ensure that any stockpiled materials or wastes are fully protected and located as far as possible from any inlets.
Table 4-5 lists the BMPs that shall be implemented to handle materials and control construction site wastes associated with these construction activities. Fact Sheets for Materials and Waste Management BMPs are provided in Appendix H.

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Table 4-5 Temporary Materials Management BMPs

CASQA Fact Sheet	BMP Name	Minimum Required for All Projects	BMP Used? (1)	If Not Used, State Reason
WM-01	Material Delivery and Storage	X	Yes	
WM-02	Material Use	X	Yes	
WM-03	Stockpile Management(2)	X	Yes	
WM-04	Spill Prevention and Control	X	Yes	
WM-05	Solid Waste Management	X	Yes	
WM-06	Hazardous Waste Management		Yes	
WM-07	Contaminated Soil Management(3)		No	Contaminated soil not anticipated
WM-08	Concrete Waste Management	X	Yes	
WM-09	Sanitary-Septic Waste Management	X	Yes	
WM-10	Liquid Waste Management		No	Liquid waste not anticipated
Alternate BMPs Used:			**If Used, State Reason:**	

1. The 2022 CGP Fact Sheet, Section I.R.1.d through I.R.1.i, describes various BMPs that should be considered for use on the construction site. Applicability to a specific Project shall be determined by the QSD.
2. Projects discharging directly to San Diego Bay must ensure that any stockpiled materials or wastes are fully protected and located as far as possible from any inlets.
3. Project sites with pre-existing soil contamination issues must implement contaminated soil management BMPs.

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Material management BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Maps will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site-specific details in the Site Maps prevail over standard details included in the Site Maps. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

Material Delivery and Storage

- WM-1, Material Handling and Delivery; WM-2, Material Use
  Subcontractors will utilize BMP WM-1 for construction material loading, unloading, and short-term storage. Subcontractors will utilize stabilized areas, as necessary, to prevent potential spills or unnecessary tracking of sediment. Subcontractors will implement BMP WM-2 for construction material utilization.
  BMPs WM-1 and WM-2 shall be implemented to minimize stormwater contact with construction materials during handling, delivery, or use. The general material storage area shall be located off-site.

Stockpile Management

- WM-3, Stockpile Management
  Subcontractors shall implement BMP WM-3 when soil is stockpiled onsite. Perimeter sediment barriers and stockpile covering material will be used when the stockpile becomes inactive (i.e. no activity for 14 or more days) or before forecasted precipitation events. Stockpile management will follow applicable soil management plans for the Site.

Spill Prevention and Control

- WM-4, Spill Prevention and Control
  Subcontractors shall implement BMP WM-4 when any chemical and/or hazardous substance is used or stored onsite. Spills of petroleum products, sanitary wastes, septic wastes and substances listed under 40 CFR parts 11, 117, 302, shall be contained and cleaned up immediately.

Solid Waste Management; Hazardous Waste Management

- WM-5, Solid Waste Management; WM-6, Hazardous Waste Management
  Subcontractors shall implement BMP WM-6 whenever waste is generated, stockpiled or removed from the Site. Implementation of BMP WM-6 minimizes potential for solid and hazardous waste pollutants to come in contact with stormwater.
  BMP WM-5 and WM-6 will be implemented to minimize stormwater contact with waste materials and prevent waste discharges. Solid wastes will be loaded directly into trucks for offsite disposal. When onsite storage is necessary, solid wastes will be stored in watertight dumpsters in the general storage area of the Contractor's yard. Dumpsters will be located as necessary at the Site and lids will be closed each day when work concludes. It is recommended that solid waste be removed and disposed offsite at least weekly.
  Hazardous wastes will be stored in shipping containers or covered containment areas. Containers will be clearly marked and segregated from non-hazardous waste materials. The generation of hazardous waste and materials is not anticipated for this project.

Concrete Waste Management

- WM-8, Concrete Waste Management

Subcontractors shall implement BMP WM-8 when concrete waste is generated. Above grade portable concrete washout facilities will be constructed and maintained at concrete waste washout areas. All excess concrete and concrete washout slurries will be discharged to the washout facility for drying. BMP maintenance, waste disposal, and removal will be conducted in accordance with guidelines set forth in BMP WM-8.

Sanitary Waste Management; Septic Waste Management

- WM-9, Sanitary/Septic Waste Management
  Subcontractors shall implement BMP WM-9 when managing sanitary and/or septic waste. BMP WM-9 is applicable to temporary and portable sanitary/septic systems at the Project site. Toilets will be positioned away from concentrated flow paths and traffic areas and will be anchored and contained according to BMP Manual specifications. Housekeeping BMPs will be implemented in conjunction with BMP WM-9 as applicable.

4.5 Post-Construction Stormwater Management Measures

Post-construction BMPs are permanent measures installed during construction that are designed to reduce or eliminate pollutant discharges from the Site after construction is completed. A plan for the post-construction funding and maintenance of these BMPs has been developed to address at minimum five years following construction. The post-construction BMPs that are described above will be funded and maintained as described in the Operations and Maintenance Plan that will be uploaded with the NOT.

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5.0 BMP Inspection and Maintenance

5.1 BMP Inspection and Maintenance

The 2022 CGP requires routine weekly inspections of BMPs, along with inspections before, during, and after qualifying precipitation events. A BMP inspection checklist must be filled out for inspections and maintained on site with the SWPPP. The inspection checklist includes the necessary information covered in Section 8. A blank inspection checklist can be found in Appendix I. Completed checklists shall be kept in Construction Site Monitoring Program (CSMP) Attachment 2 "Monitoring Records."

BMPs shall be maintained regularly to ensure proper and effective functionality. If necessary, corrective actions shall be implemented immediately upon identification by the Project Superintendent, Foreman, QSD/QSP, Legally Responsible Person, Construction Manager, or any duly authorized agent or individual. All corrective action must be completed within 72 hours of identification, and prior to the next forecasted precipitation event (2022 CGP Appendix D Section II.J).

Any discharge leaving the Project site boundary and/or entering any functioning portion of the on-site stormwater conveyance system must be stopped and cleaned up immediately. Stopping and cleaning up any such discharge will be given the highest priority above all other site activities, except for those necessary to ensuring job site safety.

Any associated amendments to the SWPPP that may be required as result of an inspection or corrective action shall be prepared by the QSD.

The QSP will verify that all BMP maintenance and repairs were appropriately implemented. The QSP may delegate BMP maintenance and repair verification to an appropriately trained QSP delegate.

Specific details for maintenance, inspection, and repair of Construction Site BMPs can be found in the BMP Fact sheets in Appendix H.

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6.0 Training

Appendix K identifies the QSPs and QSP delegates for the Project. To promote stormwater management awareness specific to this Project, periodic training of job-site personnel shall be included as part of routine Project meetings (e.g., daily/weekly tailgate safety meetings), or task specific trainings as needed. Refresher training will be provided as necessary.

All employees and subcontractors working on the Site shall be provided with general awareness training on stormwater pollution prevention and the implementation of the SWPPP prepared for the Project. This training shall include but not be limited to the location of the storm drains on the job site; the direct link between the storm drain system and the bay; potential pollutants; spill and leak prevention and response; bacteria source control; and the proper implementation of the BMPs being used on site.

The QSP will be responsible for providing this information at the meetings and subsequently completing the Training Reporting Form in Appendix J, which identifies the site-specific stormwater topics covered as well as the names of site personnel who attended the meeting.

The QSP may delegate specific tasks to trained QSP Delegates who have received the following training based on the guidelines developed by the Construction General Permit Training Team:

1. Foundational training for all QSP Delegate(s) regarding stormwater compliance roles and responsibilities, forecast information, and documentation and reporting procedures; and
2. Site-specific training regarding visual inspections, sampling procedures, and/or SWPPP and BMP implementation activities relevant to the responsibilities assigned to the QSP Delegate(s).

The delegate cannot perform the QSD and QSP inspections required in Section V.C.4 or Section V.D.2, respectively. All QSP delegates must be listed in the SWPPP.

Documentation of training activities (formal and informal) is retained in Appendix J.

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7.0 Responsible Parties and Operators

7.1 Responsible Parties

Approved Signatory who are responsible for SWPPP implementation and have authority to sign permit-related documents are listed below. Written authorizations from the LRP for these individuals are provided in Appendix K. The Approved Signatory assigned to this Project is:

Name	Title	Phone Number

The QSD(s) identified for the Project is/are identified in Appendix K. The QSD shall have primary responsibility for assessing how construction activities will affect sediment transport, erosion, and other discharges of pollutants in stormwater runoff throughout the Project and significant authority for completing and maintaining the SWPPP, including the selection of the BMPs to be used on the Project site. The QSD may upload pertinent information into the State Water Board's SMARTS web-based database.

The QSD is required to revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations. The QSD is required to perform the following on-site visual inspections:

- Within 30 days of construction activities commencing on site
- Within 30 days following the assignment of a new QSD to the Project
- Twice annually; once August through October and once January through March
- Within 14 calendar days after following a numeric action level exceedance
- Within the time period requested in writing from Regional Water Board staff

Additional roles of the QSD when applicable:

- When infeasible to comply with Critical Slope and Sheet Flow Length Combinations for Linear Sediment Reduction Barrier (Table 1 of the 2022 CGP) due to site-specific geology or topography, the QSD shall include in the SWPPP a justification for the use of an alternative method to protect slopes from erosion and sediment loss.
- Water quality sampling.
- Determine K and LS factor for site sediment risks, review soil type identification through an accredited materials testing laboratory analysis, and conduct site-specific slopes surveys when applicable.
- For inactive Projects a QSD shall visit the inactive Project within 14 days of Regional Water Board approval of the COI to verify that the SWPPP is being implemented accordingly. If necessary, the QSD shall amend the SWPPP to address all new conditions not previously considered through a COI in SMARTS. Thereafter, perform monthly inspections by QSP or QSPs delegate.
- QSDs and QSPs are required to do on-site visual inspections at intervals that reflect potential changes to the construction site (e.g., start of construction, replacement of a QSD, twice yearly).
- Implement and prepare passive treatment plan and monitor passive treatment application and use with QSP assistance.

- Update the site-specific SWPPP on site at least 24 hours prior to the beginning of a dewatering discharge and upload the amended SWPPP to SMARTS within 14 days with current information required in Section D.4 of the 2022 CGP below, if necessary. The revised SWPPP shall be uploaded as part of a COI through SMARTS.

The discharger shall enter results of all numeric action level (e.g., turbidity and pH) exceedances through SMARTS within 10 days of the field measurements demonstrating the exceedance.

The QSD shall revise the SWPPP to incorporate immediate corrective actions to prevent further exceedances of the numeric action levels for pH and turbidity within 10 days of the exceedance.

The QSP shall have primary responsibility and significant authority for the implementation, maintenance, and inspection/monitoring of SWPPP requirements. The QSP will be available at all times throughout the duration of the Project. Duties of the QSP include but are not limited to:

Implementing all elements of the 2022 CGP and SWPPP, including but not limited to:

- Performing the following on-site visual inspections:
    - One inspection per calendar month; other weekly inspections in the month can be delegated to a trained QSP Delegate under the specific direction of the QSP
    - Within 72 hours prior to a forecasted qualifying precipitation event to inspect any areas of concern and to verify the status of any deficient BMPs or other identified issues at the site. If extended forecast precipitation data (greater than 72 hours) is available from the National Weather Service, then the Pre-Precipitation Event inspection may be done up to 120 hours in advance
    - Within 14 days after a NAL exceedance, the QSP shall visually inspect the drainage area for exceedance and document any areas of concern
    - Prior to the submittal for the NOT or COI (for acreage changes) for all or part of the Site
    - If applicable inspect passive treatment zone surface conditions within 72 hours before forecasted precipitation events and within 48 hours after qualifying precipitation events. Additionally complete passive treatment inspection checklist form to include:
        - Application date(s)
        - Application method(s)
        - Weather condition(s) during application
        - Estimated flow rate
        - Estimated volume of water being treated
        - Application rate(s), dosing, and mixing, consistent with the Passive Treatment Plan
        - Any other site-specific conditions or observations relevant to the functioning of the product

- Ensuring that all BMPs are implemented, inspected, and properly maintained, including but not limited to those addressing non-stormwater management, sediment tracking, materials and waste management activities, vehicle and equipment cleaning, and fueling and maintenance
- Ensuring that the SMARTS generated WDID Number Notification form is posted on site in a location viewable by the public or readily available upon request and the dates are correct and match the dates listed in SMARTS
- Implementing non-stormwater management and materials and waste management activities such as: monitoring discharges; general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than stormwater are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems, etc.
- Ensuring elimination of unauthorized discharges
- The QSPs shall be assigned authority by the LRP to mobilize crews in order to make immediate repairs to the control measures
- Coordinating with the Contractor(s) to assure all necessary corrections/repairs are made immediately and that the Project complies with the SWPPP, the 2022 CGP, and approved plans at all times. QSP also ensures that all BMP issues are documented and verifies any BMP maintenance and repairs during the next visual inspection following completion
- Notifying the Project Manager and Construction Manager immediately of off-site discharges or other non-compliance events
- Performing non-stormwater and stormwater sampling and monitoring activities, including assessing sampling site conditions; conducting on-site visual inspections before, during, and after qualifying storms; sampling during storms; and addressing exceedances (as required)
- Providing foundation and site-specific training to QSP Delegates and overseeing QSP Delegate work. Tasks that may be delegated to appropriately trained QSP-delegates include:
    - Performing non-stormwater and stormwater visual observations and inspections
    - Performing stormwater sampling and analysis, as required
    - Performing routine inspections and observations
- Training job-site personnel (as described in Section 6)
- Training and supervising any delegated personnel on appropriate activities, including stormwater compliance, sampling protocols, visual inspections, and BMP implementation
- Ensuring site meets all NOT requirements, including installation of post-construction stormwater runoff BMPs and/or low impact development features, and preparing final NOT inspection
- Present on site during dewatering activities

7.2 Contractor List

A list of all contractors and subcontractors that are active on the contruction site can be found under Appendix L and should be updated as the work progresses.

8.0 Construction Site Monitoring Program (CSMP)

8.1 Purpose

This CSMP was developed to address the following objectives:

1. To demonstrate that the Site is in compliance with the Discharge Prohibitions of the 2022 CGP and applicable NALs
2. To determine whether non-visible pollutants discharged from the construction site and are causing or contributing to exceedances of water quality objectives
3. To determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges
4. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.

8.2 Applicability of Permit Requirements

This Project has been determined to be a Risk Level 1 Project. The 2022 CGP identifies the following types of monitoring as being applicable for a Risk Level 1 Project.

Risk Level 1

- Visual inspections of BMPs
- Visual monitoring of the Site related to qualifying precipitation events
- Visual monitoring of the Site for non-stormwater discharges
- Sampling and analysis of construction site runoff for non-visible pollutants identified during the pollutant source assessments when applicable
- Sampling and analysis of construction site runoff as required by the Regional Water Board when applicable.

8.3 Weather and Precipitation Event Tracking

Visual monitoring and inspections requirements of the 2022 CGP are triggered by a Qualifying Precipitation Event (QPE). The 2022 CGP defines a QPE as any weather pattern that is forecast to have a 50 percent or greater probability of precipitation and a quantitative precipitation forecast of 0.5 inches or more within a 24-hour period. The event begins with the 24-hour period when 0.5 inches has been forecast and continues on subsequent 24-hour periods when 0.25 inches of precipitation or more is forecast.

8.4 Weather Tracking

The QSP should consult the National Oceanographic and Atmospheric Administration (NOAA) National Weather Service (NWS) daily for weather forecasts. Forecasts for can be obtained at https://www.weather.gov/sgx. Weather reports should be printed and maintained with the SWPPP in CSMP Attachment 1 “Weather Reports.” Record the date and time the forecast was printed.

8.5 Rain Gauges

The QSP shall either use the rain gauge information for the nearest weather station, which can be obtained at https://www.weather.gov/sgx, or install rain gauge(s) on the Project site. Any rain gauges installed must be

DRAFT

located in an open area away from obstructions such as trees or overhangs. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Make sure that the top of the gauge is level. Make sure the post is not in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc.

Once the rain gauge reading has been recorded, accumulated rain shall be emptied and the gauge reset. For comparison and confirmation of information, any on-site rain gauge totals should be compared with the totals collected by the nearest weather station.

8.6 Monitoring Locations

Monitoring locations are shown on the Site Maps in Appendix B. Temporary changes that result in a one-time sampling location do not require a SWPPP amendment.

8.7 Safety and Monitoring Exemptions

Safety practices for sample collection will be in accordance with the Site approved Accident Prevention Plan. This Project is not required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as electrical storms, flooding and high winds above 40 miles per hour
- Outside of scheduled site business hours
- When the Site is not accessible to personnel.

Scheduled site business hours are subject to change and tentatively scheduled for:

- 0700-1700 Monday-Friday

If monitoring (visual monitoring or sample collection) of the Site is unsafe because of the dangerous conditions noted above, then the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be filed in CSMP Attachment 2 “Monitoring Records” and must be included in the Annual Report.

8.8 Visual Monitoring

Visual monitoring includes observations and inspections. Inspections of BMPs are required to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Visual observations of the Site are required to observe stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources.

Per Section III.B.2. of Attachment D in the 2022 CGP, “For inactive Projects, dischargers may reduce the visual inspection frequency and suspend sampling per Section III.G of the 2022 CGP. Dischargers shall provide an explanation with supporting information for all missed visual inspections or sampling required by this Attachment, to be included in the Annual Report.”

Table 8-1 identifies the required frequency of visual observations and inspections. Inspections and observations will be conducted at the locations identified in Site Maps in Appendix B.

Table 8-1 Summary of Visual Monitoring and Inspections

Type of Inspection	Frequency
Routine Inspections	
BMP Inspections	Weekly [1,2]
BMP Inspections – Tracking Control	Daily
QPE Triggered Inspections	
Site Inspections Prior to a QPE	Within 72 hours prior to a QPE or up to 120 hours prior if supported with forecast [2]
BMP Inspections During an Extended QPE	Once every 24-hour period of a QPE [3]
Site Inspections Following a QPE	Within 96 hours after a QPE [2]

1. Most BMPs must be inspected weekly; those identified below must be inspected more frequently.
2. Inspections are required during scheduled site operating hours.
3. Inspections are required during scheduled site operating hours on days that the forecast predicts at least 0.25 inches of precipitation once the QPE commences.

8.9 Routine Observations and Inspections

Routine site inspections and visual monitoring are necessary to ensure that the Project is in compliance with the requirements of the 2022 CGP.

8.9.1 Routine BMP Inspections

Inspections of BMPs are conducted to identify and record:

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

8.9.2 Non-Stormwater Discharge Observations

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

- Presence or evidence of any non-stormwater discharge (authorized or unauthorized)
- Identification and elimination of unauthorized non-stormwater discharges
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.)
- Source of discharge

8.9.3 QPE Triggered Observations and Inspections

Visual observations of the Site and inspections of BMPs are required prior to a QPE, following a QPE, and every 24-hour period during a QPE. Pre-QPE inspections will be conducted after consulting NOAA/NWS and determining that a precipitation event with a 50 percent or greater chance of 0.5 inches or more of precipitation in a 24-hour period has been predicted by the NWS Forecast Office.

DRAFT

8.9.4 Visual Observations Prior to a Forecasted QPE

Within 72 hours prior to a QPE or up to 120 hours prior if extended forecast precipitation data is available, a stormwater visual monitoring site inspection will be conducted that will include observations of the following locations:

- All stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources and when necessary, implement appropriate corrective actions
- All BMPs to identify whether they have been properly implemented per the SWPPP and implement appropriate corrective actions, as necessary
- All stormwater storage and containment areas to detect leaks and check for available capacity to prevent overflow

The QSP must conduct the inspection prior to the QPE. Consistent with the requirements for a QPE, pre-precipitation BMP inspections and visual monitoring will be triggered by a NOAA/NWS forecast that indicates an event with a 50 percent or greater probability of 0.5 inches or more of precipitation in a 24-hour period has been predicted in the Project area.

8.9.5 BMP Inspections During a QPE

During an extended QPE, BMP inspections will be conducted at least once every 24 hours. QPEs are extended for each subsequent 24-hour period forecast to have at least 0.25 inches of precipitation. The purpose of the BMP inspections is to:

- Identify and record if BMPs were adequately designed, implemented and effective
- Identify and record BMPs that require repair or replacement due to damage
- Identify and record any additional BMPs that need to be implemented and revise the SWPPP accordingly

If the construction site is not accessible during the QPE, the visual inspections shall be performed at all relevant outfalls, discharge points, downstream locations. The inspections should record any Projected maintenance activities.

8.9.6 Visual Observations Following a QPE

Within 96 hours following the end of a QPE a stormwater visual monitoring site inspection is required to:

- Observe if BMPs were adequately designed, implemented, and effective
- Identify BMPs that require repair or replacement due to damage
- Identify additional BMPs that need to be implemented and revise the SWPPP accordingly

8.9.7 Visual Monitoring Procedures

Visual monitoring shall be conducted by the QSP or QSP's delegate. The name(s) and contact number(s) of the site visual monitoring personnel are listed below and their training qualifications are provided in Appendix K.

Assigned inspector: TBD Contact phone: TBD

Stormwater observations shall be documented on the Visual Inspection Field Log Sheet (see CSMP Attachment 3 "Example Forms"). BMP inspections shall be documented on the site-specific BMP inspection checklist. Any photographs used to document observations and issues will be referenced on the stormwater site inspection report, along with the QSP's description of the problem.

DRAFT

The QSP shall within 3 days of the inspection submit copies of the completed inspection report to Authority SWPPP. The completed reports will be kept in CSMP Attachment 2 “Monitoring Records.” Results of visual monitoring must be summarized and reported in the Annual Report.

8.9.8 Visual Monitoring Follow-Up and Reporting

Maintenance, repairs, and correction of deficiencies, including design changes to BMPs, identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed within 72 hours of identification, prior to the next forecasted precipitation event. When design changes to BMPs are required, the SWPPP should be amended to reflect the changes.

Deficiencies identified in site inspection reports, and correction of deficiencies, will be tracked on the *Inspection Field Log Sheet* or *BMP Inspection Report* and shall be submitted to the QSP and shall be kept in CSMP Attachment 2 “Monitoring Records.” QSP Delegates shall report issues identified during inspections that require corrective action to the QSD within 24 hours of the observation. The QSP should, within 3 days of the inspection, submit copies of the completed *Inspection Field Log Sheet* or *BMP Inspection Report* with the corrective actions to QSD. Results of visual monitoring must be summarized and reported in the Annual Report.

8.9.9 Visual Monitoring Locations

The inspections and observations will be conducted at the locations identified on the Site Maps in SWPPP Appendix B. Until permanent stormwater facilities are complete, stormwater that falls on the southern half of the Site will generally sheet flow south and east toward the southeast corner of the facility, where the construction entrance will be located, before discharging to existing offsite inlets. Stormwater from the northeastern portion of the Site will flow east to existing offsite inlets, while stormwater from the northwestern portion will collect along the western site boundary.

The design proposes to regrade the Site to alleviate the existing ponding conditions on the west side. Upon completion of construction, stormwater will be conveyed to a newly constructed infiltration basin designed to manage runoff from the developed site, and ponding is not anticipated on the northern boundary.

8.10 Water Quality Sampling and Analysis

8.10.1 Sampling and Analysis Plan for Non-Visible Pollutants in Stormwater Runoff Discharges

Sampling and analysis of runoff at discharge locations are not required for Risk Level 1 Projects unless there are non-visible pollutants and the conditions described in the next paragraph occur. This Sampling and Analysis Plan for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in stormwater runoff discharges from the Project site.

Sampling for Risk Level 1 Projects for non-visible pollutants in stormwater runoff discharges will only be conducted when (1) a breach, leakage, malfunction, or spill is observed; (2) the leak or spill has not been cleaned up prior to the precipitation event and BMPs to control the pollutant are not implemented, maintained, or replaced as necessary; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system, which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

The potential sources of non-visible pollutants to stormwater discharges from the Project's construction materials, wastes, or activities, and the water quality constituent or indicator for those pollutants are presented in Table 8-2.

Table 8-2 Potential Non-Visible Pollutants and Water Quality Indicator Constituents Based on the Pollutant Source Assessment

Pollutant	Water Quality Indicator or Constituent	Source/Reason from Pollutant Source Assessment
Hydrocarbons	Oil and Grease, TPH	Gasoline, diesel, and lubricating oil
Heavy metals	Zinc, Copper, Lead, Chromium	Brake and tire wear, maintenance activities
Sediment, particulates	TSS, Turbidity	Erosion, particulate matter from tire and brake wear, and construction activities

8.10.2 Sampling Schedule

Samples for the potential non-visible pollutant(s) and a sufficiently large unaffected background sample shall be collected during the first 8 hours of discharge from precipitation events that result in a sufficient discharge for sample collection. Samples shall be collected during the Site's scheduled hours and shall be collected regardless of the time of year and phase of the construction, and only when the conditions discussed in this section occur for Risk Level 1 Projects.

Collection of discharge samples for non-visible pollutant monitoring will be triggered only when any of the following conditions are observed during site inspections conducted prior to or during a precipitation event:

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents stormwater contact and runoff from the storage area
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the precipitation event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- A construction activity, including but not limited to those in Section 3 with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the precipitation event, (2) BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

8.10.3 Sampling Locations

Sampling locations should be based on proximity to unplanned non-visible pollutant releases and accessibility for sampling, and personnel safety. Unplanned non-visible pollutant sampling locations can be added to Table 8-3 as they occur, to provide a record of those sampling locations.

Table 8-3 Unplanned Non-Visible Pollutant Sample Locations

Sample Location Identifier	Sample Location Description	Sample Location Latitude and Longitude (Decimal Degrees)	Runoff or Run-on
TBD	TBD	TBD	TBD

The collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants, should not have come into contact with the unplanned non-visible pollutant release.

8.10.4 Monitoring Preparation

Non-visible pollutant samples will be collected by QSP or QSP delegate from the:

Contractor ☐ Yes ☐ No

Consultant ☐ Yes ☐ No

Laboratory ☐ Yes ☐ No

Samples on the Project site will mostly be collected by the following contractor sampling personnel under the supervision of the QSP that have been properly trained to collect samples:

QSP Delegate:
Telephone Number:
Company Name:
Street Address:
City, State Zip:
Telephone Number:
Point of Contact:
Name of Sampler(s):
Name of Alternate(s):
Alternate(s)/Telephone Number:

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the Project site prior to a potential sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. The QSP or QSP Delegates responsible for sampling should be available to collect samples if needed. Supplies maintained at the Project site will include, but are not limited to, clean powder-free nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, ice, and Effluent Sampling Field Log Sheets and Chain of Custody (CoC) forms, which are provided in CSMP Attachment 3 “Example Forms.”

8.10.5 Sample Collection

Samples of discharge shall be collected in the locations determined by observed breaches, malfunctions, leakages, or spills, that triggered the sampling event, and hydraulically downgradient from the observed triggering event or condition. Dischargers shall continue to collect at least one sample per applicable discharge location for each 24-hour period that there is discharge, until the necessary corrective actions are completed to control further discharge of the non-visible pollutant.

Grab samples shall be collected and preserved in accordance with Table 8-3. Only the QSP or QSP delegates, trained in water quality sampling shall collect samples. Sample collection and handling requirements are described in this section.

8.10.6 Analytical Constituents

Table 8-2 lists the specific sources and types of potential non-visible pollutants on the Project site based on the Project pollutant source assessment and the water quality indicator constituent(s) for that pollutant. Table 8-4 provides specific analytical methods and reporting limits for the potential non-visible pollutants. Analytical methods were selected in compliance with EPA sufficiently sensitive method requirements in 40 Code of Federal Regulations Part 136, as evidenced by the method detection limit and minimum level.

8.10.7 Sample Analysis

Samples shall be analyzed using the analytical methods identified in Table 8-4.
Samples will be analyzed by:

Laboratory Name:

Street Address:

City, State Zip:

Telephone Number:

Point of Contact:

ELAP Certification Number:

Samples will be delivered to the laboratory by:

Driven by QSP/QSP Delegate	☐ Yes	☐ No
Picked up by Laboratory Courier	☐ Yes	☐ No
Shipped	☐ Yes	☐ No

DRAFT

Table 8-4 Sample Collection, Preservation and Analysis for Monitoring Non Visible Pollutants

Constituent	Analytical Method	Minimum Sample Volume	Sample Containers	Sample Preservation	Reporting Limit (or Minimum Level)	Maximum Holding Time
VOCs – Solvents	EPA 8260B	3 x 40 mL	VOA – glass	Store at 4˚C, HCl to pH<2	Varies per Individual Constituent	14 days
SVOCs	EPA Method 8270C	1 x 1 L	Glass – amber	Store at 4˚C	Varies per Individual Constituent	7 days
Pesticides/PCBs	EPA Method 8081A/8082	1 x 1 L	Glass – amber	Store at 4˚C	0.1 µg/L	7 days
Herbicides	EPA Method 8151A	1 x 1 L	Glass – amber	Store at 4˚C	Check laboratory	7 days
BOD	EPA Method 405.1	1 x 500 mL	Polypropylene	Store at 4˚C	1 mg/L	48 hours
COD	EPA Method 410.4	1 x 250 mL	Glass – amber	Store at 4˚C, H_2SO_4 to pH<2	5 mg/L	28 days
DO	SM 4500-O G	1 x 250 mL	Glass – amber	Store at 4˚C	Check laboratory	(8 hours after chemical additions) Immediate
pH	EPA 150.1	1 x 100 mL	Polypropylene	None	unitless	Immediate
Alkalinity	SM 2320B	1 x 250 mL	Polypropylene	Store at 4˚C	1 mg/L	14 days
Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Na, Th, Va, Zn)	EPA 200.8/200.7	1 x 250 mL	Polypropylene	Store at 4˚C, HNO_3 to pH<2	0.1 mg/L	6 months
Metals (Chromium VI)	EPA 7196/SM3500	1 x 1 L	Polypropylene	Store at 4˚C	1 µg/L	24 hours

˚C = degrees Celsius
BOD = biochemical oxygen demand
COD = chemical oxygen demand
DO = dissolved oxygen
EPA = U.S. Environmental Protection Agency
HCl = hydrogen chloride
H_2SO_4 = hydrogen sulfide
HNO_3 = nitric acid
L = liter
mg/L = milligrams per liter
µg/L = micrograms per Liter
mL = milliliter
PCBs = polychlorinated biphenyls
SVOCs = Semi-Volatile Organic Compounds
SM = Standard Method
TPH = total petroleum hydrocarbons
TRPH = total recoverable petroleum hydrocarbons
VOA = volatile organic analysis
VOC = Volatile organic compound

DRAFT

8.10.8 Data Evaluation and Reporting

The QSP shall complete an evaluation of the water quality sample analytical results based on a comparison of the results to the unaffected sample.

Runoff/downgradient results shall be compared with the associated upgradient/unaffected results and any associated run-on results. Should the runoff/downgradient sample show an increased level of the tested analyte relative to the unaffected background sample, which cannot be explained by run-on results, the BMPs, site conditions, and surrounding influences shall be assessed to determine the probable cause for the increase.

As determined by the Site and data evaluation, appropriate BMPs shall be repaired or modified to mitigate discharges of non-visible pollutant concentrations. The QSP will confer with the QSD as to which revisions to any of the BMPs rise to a level that requires an amendment to the SWPPP. Any amendments to the SWPPP shall be completed by the QSD.

The 2022 CGP prohibits stormwater discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 Code of Federal Regulations (C.F.R.) §§ 117.3 and 302.4. The results of any non-stormwater discharge results that indicate the presence of a hazardous substance in excess of established reportable quantities shall be immediately reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4. Results of non-visible pollutant monitoring shall be submitted to SMARTS within 30 days of obtaining the analytical results.

8.10.9 Sampling and Analysis Plan for pH and Turbidity in Stormwater Runoff Discharges

Sampling and analysis of runoff for pH and turbidity is not required for Risk Level 1 Projects. However, pH sampling may be necessary if there is the possibility of non-visible pollutant discharges during a BMP breach where run-on flows through and discharges off site.

8.10.10 Sampling and Analysis Plan for pH and Turbidity in Receiving Water

Receiving Water Monitoring is not required for Risk Level 1 Projects.

8.10.11 Sampling and Analysis Plan for Non-Stormwater Discharges

This Project is subject to the non-stormwater sampling and analysis requirements of the 2022 CGP, as described in Sections 8.10.1 through 8.10.8.

8.10.11.1 Sampling and Analysis Plan for Dewatering Discharges

☒ No dewatering activities are planned for this Project.

An adequate stock of monitoring supplies and equipment for monitoring turbidity and pH will be available on the Project site prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. The QSP or QSP Delegates will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the Project site will include, but are not limited to, field meters, extra batteries, clean powder-free nitrile gloves, sample collection equipment, appropriate sample containers, paper towels,

personal rain gear, and Effluent Sampling Field Log Sheets and CoC forms provided in CSMP Attachment 3 "Example Forms."

The QSP or QSP Delegates will obtain and maintain any field-testing instruments for analyzing samples in the field (e.g., pH and turbidity).

8.10.11.1.1 Sample Collection and Field Analysis

Samples for field parameters shall be analyzed for the constituents indicated in Table 8-5. Turbidity and pH samples shall be analyzed immediately.

Table 8-5 Sample Collection and Analysis for Monitoring Turbidity and pH

Parameter	Test Method	Minimum Sample Volume (1)	Sample Collection Container Type	Detection Limit (minimum)
Turbidity	Field meter/probe with calibrated portable instrument	500 mL	Polypropylene or glass (Do not collect in meter sample cells)	1 NTU
pH	Field meter/probe with calibrated portable instrument or calibrated pH test kit	100 mL	Polypropylene	0.2 pH units

1. Minimum sample volume recommended. Specific volume requirements will vary by instrument; check instrument manufacturer instructions.

L – liter
mL – milliliter
NTU – nephelometric turbidity unit

Sample collection and handling requirements are described in this chapter.

8.10.11.1.2 Data Evaluation and Reporting

Compliance with the NALs for pH and turbidity in dewatering discharges is based on a single sample evaluation. An NAL exceedance occurs when any sample exceeds the turbidity NAL or is outside of the pH range shown in Table 8-6.

Table 8-6 Numeric Action Levels

Parameter	Unit	NAL
pH	pH units	Lower NAL < 6.5 Upper NAL > 8.5
Turbidity	NTU	>250

The QSP or QSP Delegate shall immediately cease dewatering discharges if the NALs are exceeded. If the discharge is necessary to protect human life and health or prevent severe property damage and cannot be ceased, the DAR or LRP shall notify the Regional Water Board and the Local Stormwater Agency contacts in Table 8-7 within 24 hours.

DRAFT

Table 8-7 Dewatering Notification Contacts

Agency	Name	Contact
Regional Water Board	San Diego Region 9	SanDiego@waterboards.ca.gov
Local Stormwater Agency	City of National City's Storm Water Division	Stormwater Hotline (619) 336-4389

Exceedances of NALs shall be electronically reported to the State Water Board by the LRP or DAR through SMARTS within 10 days of receiving the results. Following a NAL exceedance, the QSD shall revise the SWPPP to incorporate corrective actions to prevent further exceedances within 10 days of the measurement.

8.10.12 Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board

The Regional Water Board has not specified monitoring for additional pollutants.

8.10.13 Training of Sampling Personnel

QSP Delegates assigned to conduct sampling shall be trained by the QSP to collect, maintain, and ship samples in accordance with the 2022 CGP Sample Collection and Handling Instructions and supplemental information as needed. Training records of designated contractor sampling personnel are provided in Appendix J.

The stormwater sampler(s) and alternate(s) have received the following stormwater sampling training:

Name Training

The stormwater sampler(s) and alternates have the following stormwater sampling experience:

Name Experience

8.10.13.1 Sample Collection and Handling

8.10.13.1.1 Sample Collection

Samples shall be collected, maintained, and shipped in accordance with the 2022 CGP Sample Collection and Handling Instructions. Grab samples shall be collected and preserved in accordance with the methods identified in preceding sections.

To maintain sample integrity and prevent cross-contamination, sample collection personnel shall follow the protocols below.

- Collect samples (for laboratory analysis) only in analytical laboratory-provided or specified sample containers. Use of any other type of containers could cause sample contamination and may result in NAL or NEL exceedances.
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sites;
- Decontaminate all equipment (e.g., bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water. (Dispose of wash

DRAFT

and rinse water appropriately, i.e., do not discharge to storm drain or receiving water.) Do not decontaminate laboratory provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;
- Do not park vehicles in the immediate sample collection area (even non-running vehicles);
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Typically, samples are collected by dipping the collection container in the runoff flow paths and streams as noted below.

- For small streams and flow paths, simply dip the bottle facing upstream until full.
- For larger streams that can be safely accessed, collect a sample in the middle of the flow stream by directly dipping the mouth of the bottle. Once again making sure that the opening of the bottle is facing upstream as to avoid any contamination by the sampler.
- For larger streams that cannot be safely waded, pole-samplers may be needed to safely access the representative flow.
- Avoid collecting samples from ponded, sluggish or stagnant water.
- Avoid collecting samples directly downstream from a bridge as the samples can be affected by the bridge structure or runoff from the road surface.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should **never** be dipped into the stream, but filled indirectly from the collection container.

8.10.13.1.2 Sample Handling

Turbidity and pH measurements must be conducted immediately. Do not store turbidity or pH samples for later measurement.
Samples for laboratory analysis must be handled as follows. Immediately following sample collection:

- Cap sample containers;
- Complete sample container labels;
- Place sealed containers in a re-sealable storage bag;
- Place sample containers into an ice-chilled cooler;
- Document sample information on the *Effluent Sampling Field Log Sheet*; and
- Complete the CoC.

All samples for laboratory analysis must be maintained between 0 and 6 degrees Celsius during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Place samples to be shipped inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage and secure cooler lids with packaging tape.
Ship samples that will be laboratory-analyzed to the analytical laboratory right away. Hold times are measured from the time the sample is collected to the time the sample is analyzed. The 2022 CGP requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory to meet all hold times).

Laboratory Name:

Address:

City, State Zip:

Telephone Number:

8.10.13.1.3 Sample Documentation Procedures

All original data documented on sample bottle identification labels, *Effluent Sampling Field Log Sheet*, and CoCs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Effluent Sampling Field Log Sheet.

Sample documentation procedures include the following:

- Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location. (These location identifiers should be listed in the tables in the SWPPP.)
- Field Log Sheets: Sampling personnel shall complete the *Effluent Sampling Field Log Sheet* for each sampling event, as appropriate.
- Chain of Custody: Sampling personnel shall complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the sample(s) is turned over to the testing laboratory or courier.

8.11 Active Treatment System Monitoring

Will an ATS be deployed on the Site?

☐ Yes ☒ No

This Project does not require a Project-specific Sampling and Analysis Plan for an ATS because deployment of an ATS is not planned.

8.12 Passive Treatment Monitoring

Will passive treatment technologies be deployed on the Site?

☐ Yes ☐ No

This Project does not require a Project-specific Sampling and Analysis Plan for passive treatment because deployment of passive treatment is not planned.

8.13 Watershed Monitoring Option

This Project is not participating in a watershed monitoring option.

8.14 Quality Assurance & Quality Control

An effective quality assurance and quality control (QA/QC) plan shall be implemented as part of the CSMP to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- Field logs
- Clean sampling techniques
- CoCs
- Data verification

Each of these procedures is discussed in more detail in the following sections.

8.14.1 Field Logs

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH and turbidity should also be recorded in the field log. A Visual Inspection Field Log and an Effluent Sampling Field Log Sheet are included in CSMP Attachment 3 “Example Forms.”

8.14.2 Clean Sampling Techniques

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed previously, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

8.14.3 Chain of Custody

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples
- Use of CoC forms for all samples
- Prompt sample delivery to the analytical laboratory

Analytical laboratories usually provide CoC forms to be filled out for sample containers. An example CoC is included in CSMP Attachment 3 “Example Forms.”

8.14.4 QA/QC Samples

QA/QC samples provide an indication of the accuracy and precision of the sample collection, sample handling, field measurements, and analytical laboratory methods. The following types of QA/QC will be conducted for this Project:

☐ Field Duplicates
(Required for all sampling plans with field measurements or laboratory analysis)

☐ Equipment Blanks
(Only needed if equipment used to collect samples could add the pollutants to sample)

☐ Field Blanks
(Only required if sampling method calls for field blanks)

☐ Travel Blanks
(Required for sampling plans that include VOC laboratory analysis)

8.14.4.1 Field Duplicates

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

8.14.4.2 Equipment Blanks

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment that has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters are used when sampling metals.

8.14.4.3 Field Blanks

Field blanks assess potential sample contamination levels that occur during field sampling activities. De-ionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

8.14.4.4 Travel Blanks

Travel blanks assess the potential for cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. De-ionized water blanks are taken along for the trip and held unopened in the same cooler with the VOC samples.

8.14.4.5 Data Verification

After results are received from the analytical laboratory, the QSP or QSP delegate shall verify the data to ensure that it is complete, accurate, and meets the appropriate QA/QC requirements. Data must be verified as soon as the data reports are received. Data verification shall include the following:

- Check the CoC and laboratory reports. Make sure all requested analyses were performed and all samples are accounted for in the reports.
- Check laboratory reports. Make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract
- Check data for outlier values and follow up with the laboratory. Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP or QSP delegate should especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location

- Check laboratory QA/QC results. EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP or QSP delegate shall evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.
- Check the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate. Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.
- Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:
    - Check field logs to make sure all required measurements were completed and appropriately documented
    - Check reported values that appear out of the typical range or inconsistent
      Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling
    - Verify equipment calibrations
    - Review observations noted on the field logs
    - Review notations of any errors and actions taken to correct the equipment or recording errors.

8.15 Records Retention

All records of stormwater monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board. Results of visual monitoring, field measurements and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

Records are to be kept on site while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements
- The date and approximate time of field measurements and laboratory analyses
- The individual(s) who performed the laboratory analyses
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used
- Rain gauge readings from site inspections
- QA/QC records and results
- Calibration records
- Visual observation and sample collection exemption records

- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

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9.0 References

Project Plans and Specifications prepared by Burns & McDonnell and associated subcontractors.

California Stormwater Quality Association (2024). Stormwater BMP Handbook Portal: construction, 2024, www.casqa.org

Regional Water Quality Control Board (2013). Order R9-2013-0001, NPDES Permit No. CAS0109266: National Pollutant Discharges Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining to Watersheds within San Diego Region.

State Water Resources Control Board (2022). Order 2022-0057-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

United States Department of Agriculture, Natural Resources Conservation Service (n.d.). Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

United States Environmental Protection Agency (n.d.). Local Environmental Resources. https://lew.epa.gov/

United States Geological Survey (n.d.). National Water Information System: Groundwater Levels, site 324055117064405. https://nwis.waterdata.usgs.gov/usa/nwis/gwlevels/?site_no=324055117064405&agency_cd=USGS

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CSMP Attachment 1: Weather Reports

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CSMP Attachment 2: Monitoring Records

DRAFT

CSMP Attachment 3: Example Forms

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Rain Guage Log Sheet				
Construction Site Name:				
WDID (Waste Discharge Identification) Number:				
Date (mm/dd/yy)	**Time (24-hr)**	**Initials**	**Rainfall Depth (Inches)**	**Notes:**

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

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Risk Level 1 Effluent Sampling Field Log Sheets			
Sampler:		Date:	Time Start:
Construction Site Name:			
Sampling Event Type:	☐ Stormwater	☐ Dewatering Discharge	☐ Non-visible pollutant
Field Meter Calibration			
pH Meter ID No./Desc.: Calibration Date/Time:		Turbidity Meter ID No./Desc.: Calibration Date/Time:	
Field pH and Turbidity Measurements			
Discharge Location Description	pH	Turbidity	Time
Grab Samples Collected			
Discharge Location Description	Sample Type		Time
Additional Sampling Notes:			
Time End:			

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CHAIN-OF-CUSTODY **DATE:** **Lab ID:**

DESTINATION LAB: ATTN: **ADDRESS:** **Office Phone:** **Cell Phone:**							REQUESTED ANALYSIS				Notes:
SAMPLED BY:											
Contact:											
Project Name:											
Client Sample ID	**Sample Date**	**Sample Time**	**Sample Matrix**	**Container #**	**Container Type**	**Container Pres.**					
SENDER COMMENTS:						**RELINQUISHED BY:**					
						Signature:					
						Print:					
						Company:					
						Date:				TIME:	
LABORATORY COMMENTS:						**RECEIVED BY:**					
						Signature:					
						Print:					
						Company:					
						Date:				TIME:	

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CSMP Attachment 4: Field Meter Instructions

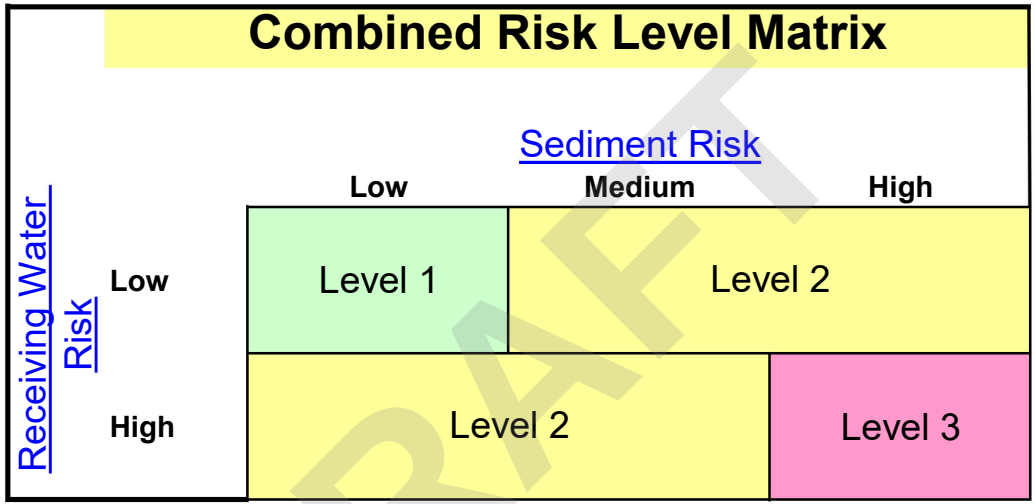
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Appendix A Calculations

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	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		27
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.32
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0.82
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		7.0848
16	**Site Sediment Risk Factor**		**Low**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

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Project Sediment Risk: Low

Project RW Risk: Low

Project Combined Risk: Level 1

Steps to Calculate an R Factor for your Small Construction Project

1 Select the estimated start and end dates of construction by clicking the calendar icons below and using the dropdown calendar. The period of construction activity begins at initial earth disturbance and ends with final stabilization.

Start Date: 08/03/2026

End Date: 05/03/2027

2 Locate your small construction project by entering the address in the search box or by clicking on the map.

Location: 1640 tidelands ave san diego

Search



3 Click the "Calculate R Factor" button below.

Calculate R Factor

Facility Information

Start Date: 08/03/2026	**Latitude:** 32.6674
End Date: 05/03/2027	**Longitude:** -117.1162

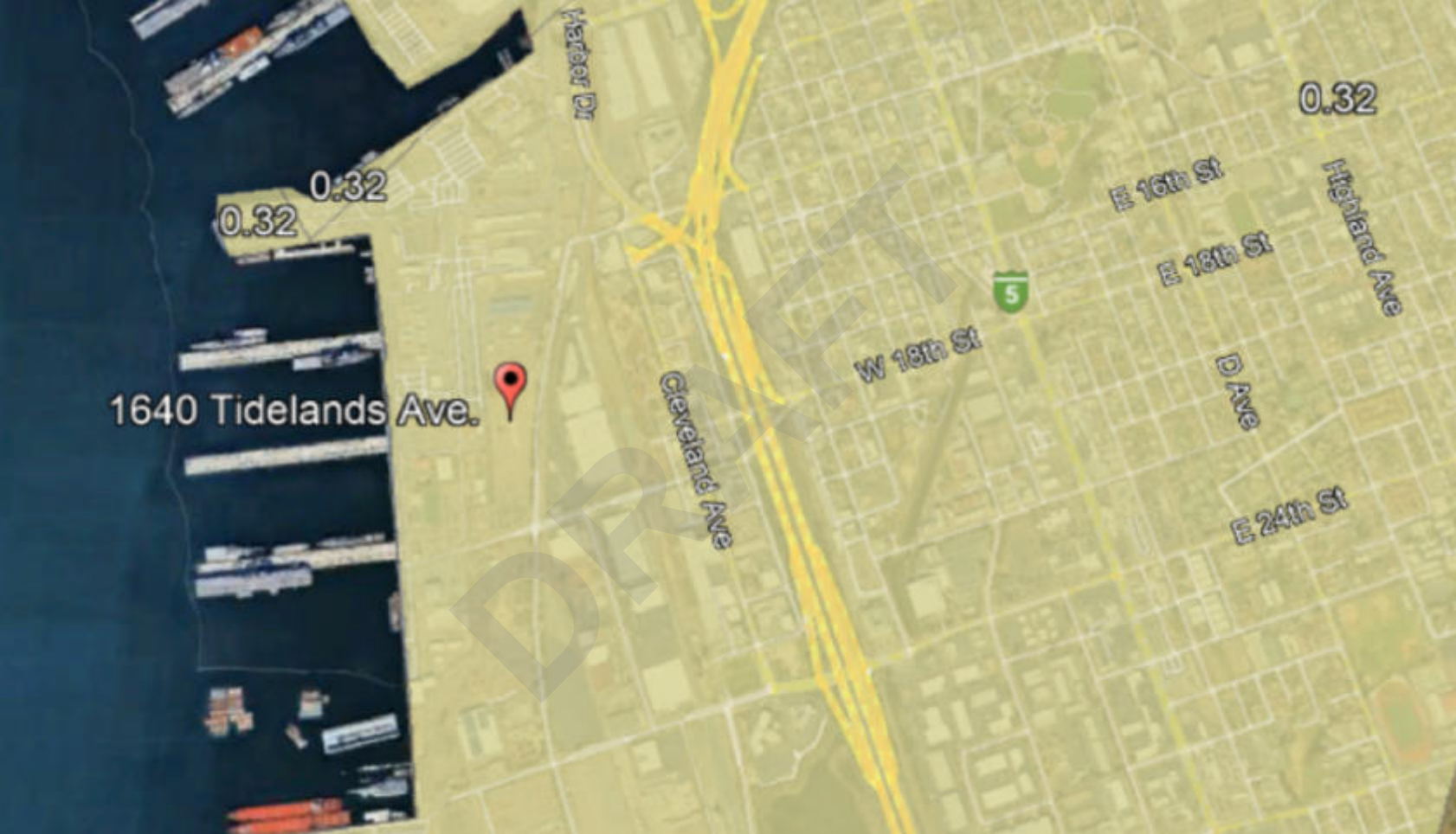
Calculation Results

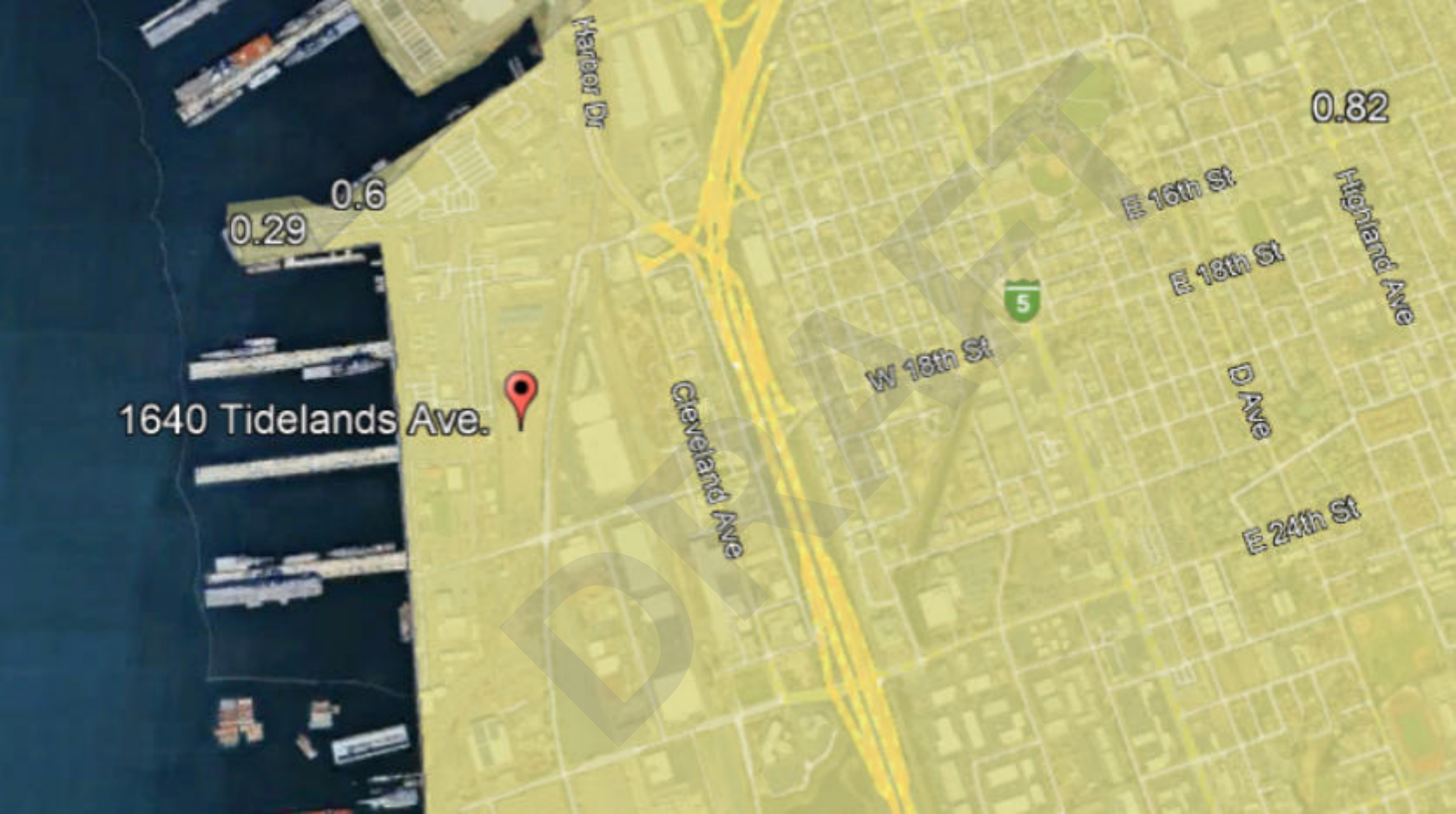
Rainfall erosivity factor (R Factor) = 27

A rainfall erosivity factor of 5.0 or greater has been calculated for your site's period of construction.

You do NOT qualify for a waiver from NPDES permitting requirements and must seek Construction General Permit (CGP) coverage. If you are located in an area where EPA is the permitting authority (pdf), you must submit a Notice of Intent (NOI) through the NPDES eReporting Tool (NeT).Otherwise, you must seek coverage under your state's CGP.

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0.32
0.32
0.32
Harbor Dr
1640 Tidelands Ave.
Cleveland Ave
W 18th St
5
E 16th St
E 18th St
Highland Ave
D Ave
E 24th St


0.6
0.29
0.82
1640 Tidelands Ave.
Harbor Dr
Cleveland Ave
W 16th St
E 16th St
E 16th St
Highland Ave
D Ave
E 24th St
5

COMPUTATION SHEET FOR DETERMINING RUNOFF COEFFICIENTS

Total Site Area = 4.2 acres *(A)*

Existing Site Conditions

Impervious Site Area[1] = 4.2 acres (B)

Impervious Site Area Runoff Coefficient[2,4] = 0.95 (C)

Pervious Site Area[3] = 0 acres (D)

Pervious Site Area Runoff Coefficient[4] = NA (E)

Existing Site Area Runoff Coefficient $\frac{(B \times C)+(D \times E)}{(A)}$ = 0.95 (F)

Proposed Site Conditions (After Construction)

Impervious Site Area[1] = 3.99 acres (G)

Impervious Site Area Runoff Coefficient[2,4] = 0.95 (H)

Pervious Site Area[3] = 0.21 acres (I)

Pervious Site Area Runoff Coefficient[4] = 0.25 (J)

Proposed Site Area Runoff Coefficient $\frac{(G \times H)+(I \times J)}{(A)}$ = 0.92 (K)

1. Includes paved areas, areas covered by buildings, and other impervious surfaces.
2. Use 0.95 unless lower or higher runoff coefficient can be verified.
3. Includes areas of vegetation, most unpaved or uncovered soil surfaces, and other pervious areas.
4. Refer to local Hydrology Manual for typical C values.

NA – Not Applicable

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Appendix B Site Maps

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Path: C:\Users\sdtimney\OneDrive - Burns & McDonnell\Documents\ArcGIS\Projects\Port of San Diego SWPPP\Port of San Diego SWPPP.aprx sdtimney 8/21/2025
Service Layer Credits: Hybrid Reference Layer: Esri Community Maps Contributors, City of Chula Vista, San Diego Unified Port District, SanGIS, California State Parks, © OpenStreetMap, Microsoft, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS
World Imagery: Earthstar Geographics



Project Area

NORTH

1 0.5 0 1

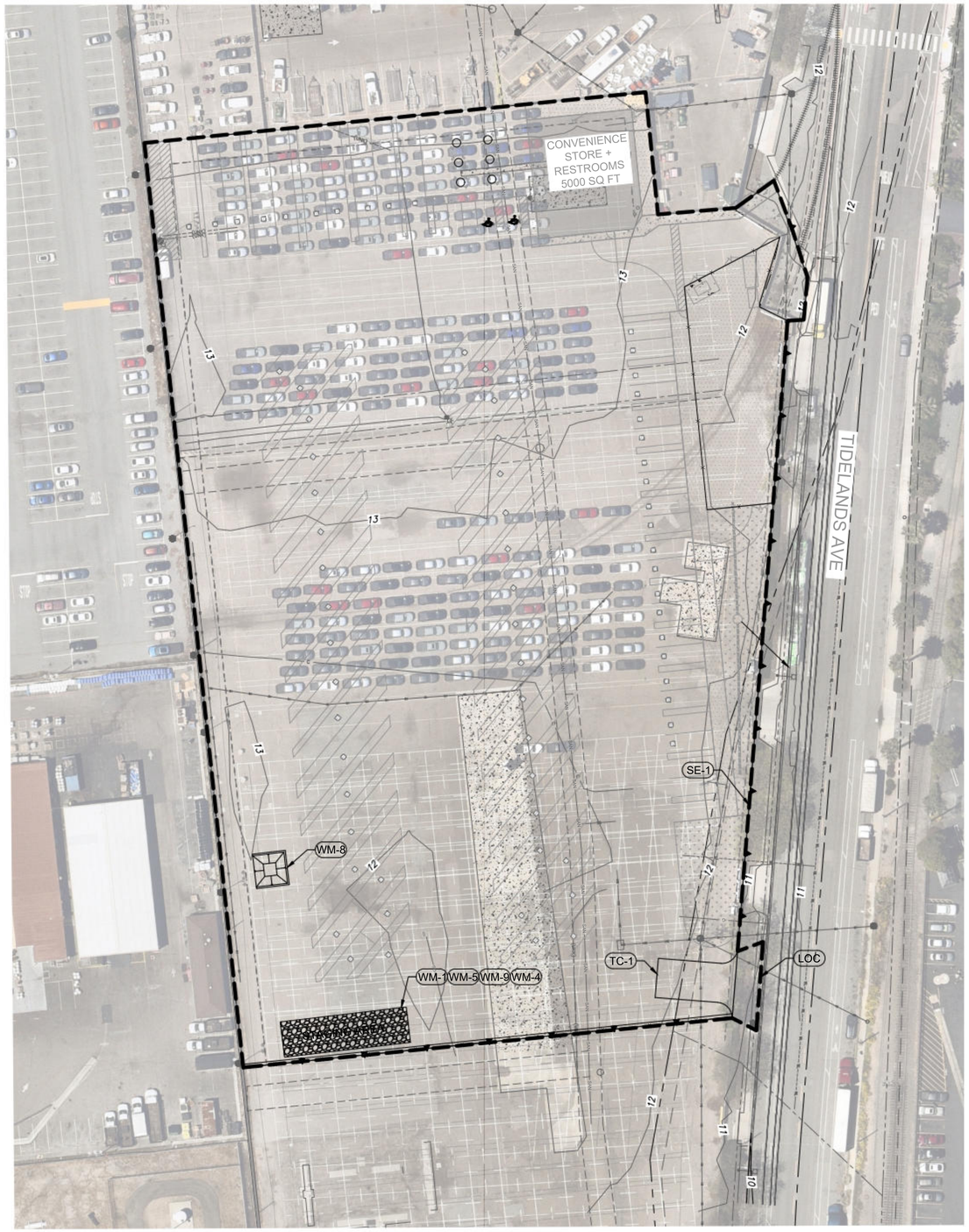
Miles

BURNS McDONNELL

Site Vicinity Map
Skycharger Zero-Emission
Truck Charging Facility

Source: ESRI Imagery, Burns & McDonnell

Issued: 8/21/2025



EROSION AND SEDIMENT CONTROL PLAN

ESCP CONTRUCTION NOTES AND LEGEND:

WM-8	INSTALL CONCRETE WASH OUT PER CASQA DETAIL WM-8	
WM-1	AREA DESIGNATED FOR CONTRACTOR STAGING AND LAYDOWN AREA. MATERIAL DELIVERY TO BE HANDLED WITHIN LAYDOWN AREA PER CASQA DETAIL WM-1	
LOC	LIMITS OF CONSTRUCTION	
SE-1	CONSTRUCT SILT FENCE PER CASQA DETAIL SE-1	
TC-1	CONSTRUCT CONSTRUCTION ENTRANCE PER CASQA DETAIL TC-1	
WM-5	SOLID WASTE MANAGMENT LOCATION PER CASQA WM-5 DETAIL. SIZE=STANDARD TRAILER SIZE. CONTRACTOR TO LOCATE ON SITE AS NECESSARY FOR CONSTRUCTION	
WM-4	SPILL PREVENTION AND CONTROL IN STAGING AREA PER CASQA WM-4 DETAIL. SIZE TO BE 10X10. CONTRACTOR TO LOCATE ON SITE AS NECESSARY FOR CONSTRUCTION SEQUENCING.	
WM-9	CONTRACTOR TO PROVIDE PORTABLE RESTROOMS PER CASQA WM-9	

PRELIMINARY - NOT FOR CONSTRUCTION

no.	date	by	ckd	description
A	08/02/24	SA	JGD	ISSUED FOR 30% REVIEW

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BURNS McDONNELL
140 S. STATE COLLEGE BLVD,
SUITE 100
BREA, CA 92821
BMCD LICENSE NO. 1107087

date 08/02/24	detailed SA
designed AE	checked JGD

SKYCHARGER

NATIONAL CITY
1640 TIDELANDS AVE
NATIONAL CITY, CA 91950

ZERO-EMISSION TRUCK CHARGING FACILITY

EROSION AND SEDIMENT CONTROL PLAN

project 172466	contract
drawing CG102	rev. A
sheet 4 of 4 sheets	
file	

Sampling locations for stormwater monitoring have not yet been selected for this Project. Once determined, the selected sampling locations will be documented in the Storm Water Pollution Prevention Plan (SWPPP) and incorporated into the Construction Site Monitoring Program (CSMP).

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Appendix C Permit Registration Documents

DRAFT

This Storm Water Pollution Prevention Plan (SWPPP) is being submitted in draft form. At this stage of the Project, certain required elements have not yet been finalized and are therefore not included in the appendices.

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Appendix D SWPPP Amendment QSD Certifications

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AMENDMENT LOG

Project Name: Skycharger Zero-Emission Truck Charging Facility

Project Number/ID: BMcD: 172466

Amendment No.	Date	Brief Description of Amendment, include section and page number	Prepared and Approved By
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#
			Name: QSD#

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Appendix E Submitted Changes of Information to PRDs

DRAFT

This Storm Water Pollution Prevention Plan (SWPPP) is being submitted in draft form. At this stage of the Project, certain required elements have not yet been finalized and are therefore not included in the appendices.

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Appendix F Construction Schedule

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This Storm Water Pollution Prevention Plan (SWPPP) is being submitted in draft form. At this stage of the Project, certain required elements have not yet been finalized and are therefore not included in the appendices.

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Appendix G Construction Activities, Materials Used, and Associated Pollutants

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Below is a list of construction activities and associated materials that are generally associated with construction activity and anticipated to be used onsite. These activities and associated materials will or could potentially contribute pollutants, other than sediment, to stormwater runoff.

Check all that apply	General Work Activity/ Products With Potential Stormwater Pollutants	Specific Work Activity/Products With Potential Stormwater Pollutants	Pollutant Categories
X	Adhesives	• Adhesives, glues, resins, epoxy synthetics, PVC cement • Caulks, sealers, putty, sealing agents and • Coal tars (naphtha, pitch)	Oil and Grease, Synthetic Organics[1]
X	Asphalt paving/curbs	Hot and cold mix asphalt	Oil and Grease
	Cleaners	Polishes (metal, ceramic, tile) Etching agents Cleaners, ammonia, lye, caustic sodas, bleaching agents and chromate	Metals, Synthetic Organics
X	Concrete / Masonry	Cement and brick dust Colored chalks Concrete curing compounds Glazing compounds Surfaces cleaners Saw cut slurries Tile cutting	Metals, Synthetic Organics
X	Drywall	Saw-cutting drywall	Metals
X	Framing/Carpentry	Sawdust, particle board dust, and treated woods Saw cut slurries	Metals, Synthetic Organics
	Heating, Ventilation, Air Conditioning	Demolition or construction of air condition and heating systems	Metals, Synthetic Organics
	Insulation	Demolition or construction involving insulation, venting	Metals, Synthetic Organics
	Liquid waste	Wash waters Irrigation line testing/flushing	Metals, Synthetic Organics
X	Painting	Paint thinners, acetone, methyl ethyl ketone, stripper paints, lacquers, varnish, enamels, turpentine, gum spirit, solvents, dyes,	Metals, Synthetic Organics
	Planting / Vegetation Management	Vegetation control (pesticides/herbicides) Planting Plant maintenance Vegetation removal	Nutrients, Metals, Synthetic Organics
X	Plumbing	Solder (lead, tin), flux (zinc chloride), pipe fitting Galvanized metal in nails, fences, and electric wiring	Metals, Synthetic Organics
	Pools/fountains	Chlorinated water	Synthetic Organics
X	Removal of existing structures	Demolition of asphalt, concrete, masonry, framing, roofing, metal structures.	Metals, Oil and Grease, Synthetic Organics

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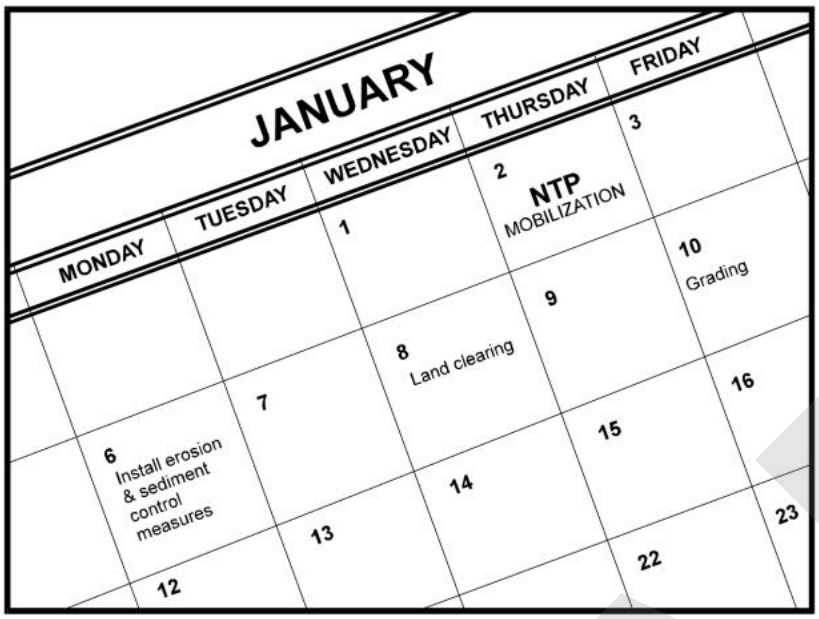
Check all that apply	General Work Activity/ Products With Potential Stormwater Pollutants	Specific Work Activity/Products With Potential Stormwater Pollutants	Pollutant Categories
X	Roofing	Flashing Saw cut slurries (tile cutting) Shingle scrap and debris	Metals, Oil and Grease, Synthetic
X	Sanitary waste	Portable toilets Disturbance of existing sewer lines.	Nutrients
	Soil preparation/amendments	Use of soil additives/amendments	Nutrients
X	Solid waste	Litter, trash and debris Vegetation	Gross Pollutants
X	Utility line testing and flushing	Hydrostatic test water Pipe flushing	Synthetic Organics
X	Vehicle and equipment use	Equipment operation Equipment maintenance Equipment washing Equipment fueling	Oil and Grease
	[1] Synthetic Organics are defined in Table 1.2 of the CASQA *Stormwater BMP Handbook Portal: Construction* as adhesives, cleaners, sealants, solvents, etc. These are generally categorized as VOCs or SVOCs.		

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Appendix H CASQA Stormwater BMP Handbook Portal: Construction Fact Sheets

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Scheduling EC-1



Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

Categories

EC	Erosion Control	☑
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
  - Erosion control BMPs
  - Sediment control BMPs
  - Tracking control BMPs
  - Wind erosion control BMPs
  - Non-stormwater BMPs
  - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
  - Sequence trenching activities so that most open portions are closed before new trenching begins.
  - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
  - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year-round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year-round and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.
- Avoid soil disturbance during periods with high wind velocities.

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

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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.

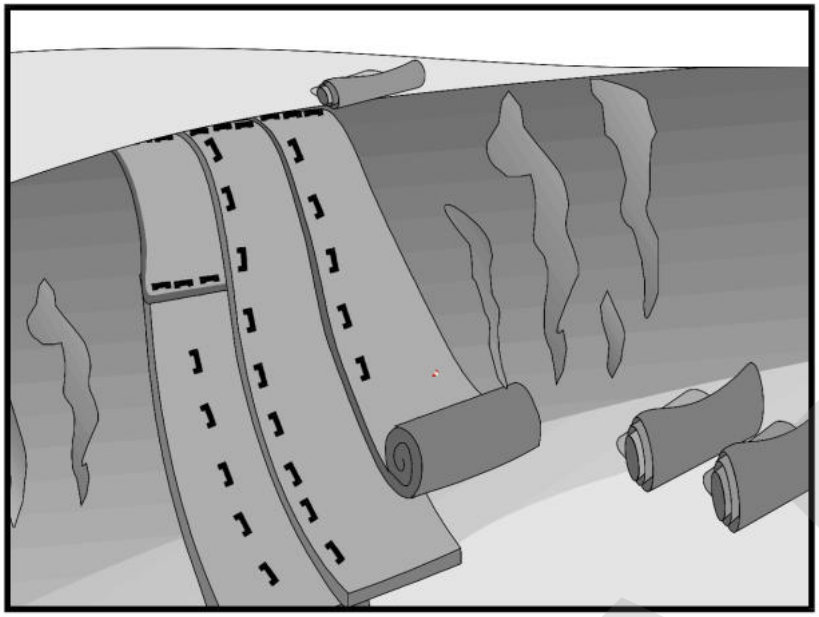
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Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

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Geotextiles and Mats EC-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	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-3 Hydraulic Mulch

EC-4 Hydroseeding

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Description and Purpose

Rolled Erosion Control Products (RECPs), also known as erosion control matting or blankets, can be made of natural or synthetic materials or a combination of the two. RECPs are used to cover the soil surface to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface. Additionally, RECPs may be used to stabilize soils until vegetation is established or to reinforce non-woody surface vegetation.

Suitable Applications

RECPs are typically applied on slopes where erosion hazard is high, and vegetation will be slow to establish. Mattings are also used on stream banks, swales and other drainage channels where moving water at velocities between 3 ft/s and 6 ft/s are likely to cause scour and wash out new vegetation and in areas where the soil surface is disturbed and where existing vegetation has been removed. RECPs may also be used when seeding cannot occur (e.g., late season construction and/or the arrival of an early rain season). RECPs should be considered when the soils are fine grained and potentially erosive. RECPs should be considered in the following situations:

- Steep slopes, generally steeper than 3:1 (H:V).
- Long slopes.
- Slopes where the erosion potential is high.
- Slopes and disturbed soils where mulch must be anchored.

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- Disturbed areas where temporary cover is needed, or plants are slow to establish or will not establish.
- Channels with flows exceeding 3.3 ft/s.
- Channels to be vegetated.
- Stockpiles.
- Slopes adjacent to water bodies.

Limitations

- RECP installed costs are generally higher than other erosion control BMPs, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- RECPs may delay seed germination, due to reduction in soil temperature and/or sunlight.
- RECPs are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (since staples and netting can catch in mowers). If a staple or pin cannot be driven into the soil because the underlying soil is too hard or rocky, then an alternative BMP should be selected.
- If used for temporary erosion control, RECPs should be removed and disposed of prior to application of permanent soil stabilization measures.
- The use of plastic sheeting should be limited to covering stockpiles or very small graded areas for short periods of time (such as through one imminent storm event) until other measures, such as seeding and mulching, may be installed.
    - Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
    - Plastic sheeting results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
- According to the State Water Board's *CGP Review, Issue #2*, only RECPs that either do not contain plastic netting or contain netting manufactured from 100% biodegradable non-plastic materials, such as jute, sisal, or coir fiber should be used due to plastic pollution and wildlife concerns. If a plastic-netted product is used for temporary stabilization, it must be promptly removed when no longer needed and removed or replaced with non-plastic netted RECPs for final stabilization.
- RECPs may have limitations based on soil type, slope gradient, or channel flow rate; consult the manufacturer for proper selection.
- Not suitable for areas that have foot traffic (tripping hazard) – e.g., pad areas around buildings under construction.
- RECPs that incorporate a plastic netting (e.g. straw blanket typically uses a plastic netting to hold the straw in place) may not be suitable near known wildlife habitat. Wildlife can become trapped in the plastic netting. As per State Water Board guidance, RECPs that

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contain plastic netting are discouraged for temporary controls and are not acceptable alternatives for permanent controls. RECPs that do not contain plastic netting or contain netting manufactured from 100% biodegradable non-plastic materials such as jute, sisal, or coir fiber should be used.

- RECPs may have limitations in extremely windy climates; they are susceptible to wind damage and displacement. However, when RECPs are properly trenched at the top and bottom and stapled in accordance with the manufacturer's recommendations, problems with wind can be minimized.

Implementation

Material Selection

- Natural RECPs have been found to be effective where re-vegetation will be provided by re-seeding. The choice of material should be based on the size of area, side slopes, surface conditions such as hardness, moisture, weed growth, and availability of materials.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.
- The following natural and synthetic RECPs are commonly used:

Geotextiles

- Material can be a woven or a non-woven polypropylene fabric with minimum thickness of 0.06 in., minimum width of 12 ft and should have minimum tensile strength of 150 lbs (warp), 80 lbs (fill) in conformance with the requirements in ASTM Designation: D 4632. The permittivity of the fabric should be approximately 0.07 sec^{-1} in conformance with the requirements in ASTM Designation: D4491. The fabric should have an ultraviolet (UV) stability of 70 percent in conformance with the requirements in ASTM designation: D4355. Geotextile blankets must be secured in place with wire staples or sandbags and by keying into tops of slopes to prevent infiltration of surface waters under geotextile. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Geotextiles may be reused if they are suitable for the use intended.

Plastic Covers

- Generally plastic sheeting should only be used as stockpile covering or for very small graded areas for short periods of time (such as through one imminent storm event). If plastic sheeting must be used, choose a plastic that will withstand photo degradation.
- Plastic sheeting should have a minimum thickness of 6 mils and must be keyed in at the top of slope (when used as a temporary slope protection) and firmly held in place with sandbags or other weights placed no more than 10 ft apart. Seams are typically taped or weighted down their entire length, and there should be at least a 12 in. to 24 in. overlap of all seams. Edges should be embedded a minimum of 6 in. in soil (when used as a temporary slope protection).
- All sheeting must be inspected periodically after installation and after significant rainstorms to check for erosion, undermining, and anchorage failure. Any failures must be repaired

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immediately. If washout or breakages occur, the material should be re-installed after repairing the damage to the slope.

Erosion Control Blankets/Mats

- Biodegradable RECPs are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable. See typical installation details at the end of this fact sheet.

  - **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. The performance of jute as a stand-alone RECP is low. Most other RECPs outperform jute as a temporary erosion control product and therefore jute is not commonly used. It is designed to be used in conjunction with vegetation. The material is supplied in rolled strips, which should be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Excelsior** (curled wood fiber) blanket material should consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 6 in. or longer. The excelsior blanket should be of consistent thickness. The wood fiber must be evenly distributed over the entire area of the blanket. The top surface of the blanket should be covered with a photodegradable extruded plastic mesh. The blanket should be smolder resistant without the use of chemical additives and should be non-toxic and non-injurious to plant and animal life. Excelsior blankets should be furnished in rolled strips, a minimum of 48 in. wide, and should have an average weight of 0.8 lb/yd^2, ±10 percent, at the time of manufacture. Excelsior blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

  - **Straw blanket** should be machine produced mats of straw with a lightweight biodegradable netting top layer. The straw should be attached to the netting with biodegradable thread or glue strips. The straw blanket should be of consistent thickness. The straw should be evenly distributed over the entire area of the blanket. Straw blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd^2. Straw blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

  - **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Coconut fiber blanket** should be a machine produced mat of 100 percent coconut fiber with biodegradable netting on the top and bottom. The coconut fiber should be attached to the netting with biodegradable thread or glue strips. The coconut fiber blanket should be of consistent thickness. The coconut fiber should be evenly distributed over the entire area of the blanket. Coconut fiber blanket should be furnished in rolled strips with a minimum of 6.5 ft wide, a minimum of 80 ft. long and a minimum of 0.5

lb/yd^2. Coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

- **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

- **Straw coconut fiber blanket** should be machine produced mats of 70 percent straw and 30 percent coconut fiber with a biodegradable netting top layer and a biodegradable bottom net. The straw and coconut fiber should be attached to the netting with biodegradable thread or glue strips. The straw coconut fiber blanket should be of consistent thickness. The straw and coconut fiber should be evenly distributed over the entire area of the blanket. Straw coconut fiber blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd^2. Straw coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

- Non-biodegradable RECPs are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well. Only biodegradable RECPs can remain on a site applying for a Notice of Termination due to plastic pollution and wild life concerns (State Waterboard, 2016). RECPs containing plastic that are used on a site must be disposed of for final stabilization.

  - **Plastic netting** is a lightweight biaxially oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Plastic mesh** is an open weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than ¼ in. It is used with re-vegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three-dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be re-vegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Bonded synthetic fibers** consist of a three-dimensional geometric nylon (or other synthetic) matting. Typically, it has more than 90 percent open area, which facilitates

root growth. It's tough root reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

- **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high strength continuous filament geomatrix or net stitched to the bottom. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

Site Preparation

- Proper soil preparation is essential to ensure complete contact of the RECP with the soil. Soil Roughening is not recommended in areas where RECPs will be installed.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 to 3 in. of topsoil.

Seeding/Planting

Seed the area before blanket installation for erosion control and re-vegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all areas disturbed during blanket installation must be re-seeded. Where soil filling is specified for turf reinforcement mats (TRMs), seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Fertilize and seed in accordance with seeding specifications or other types of landscaping plans. The protective matting can be laid over areas where grass has been planted and the seedlings have emerged. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting according to design of planting.

Check Slots

Check slots shall be installed as required by the manufacturer.

Laying and Securing Matting

- Before laying the matting, all check slots should be installed and the seedbed should be friable, made free from clods, rocks, and roots. The surface should be compacted and finished according to the requirements of the manufacturer's recommendations.
- Mechanical or manual lay down equipment should be capable of handling full rolls of fabric and laying the fabric smoothly without wrinkles or folds. The equipment should meet the fabric manufacturer's recommendations or equivalent standards.

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Anchoring

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Metal stake pins should be 0.188 in. diameter steel with a 1.5 in. steel washer at the head of the pin, and 8 in. in length.
- Wire staples and metal stakes should be driven flush to the soil surface.

Installation on Slopes

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 6 in. deep by 6 in. wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 2 to 3 in. and staple every 3 ft (or greater, per manufacturer's specifications).
- When blankets must be spliced, place blankets end over end (shingle style) with 6 in. overlap. Staple through overlapped area, approximately 12 in. apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples should be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (H:V) to 2:1 (H:V), require a minimum of 2 staples/yd^2. Moderate slopes, 2:1 (H:V) to 3:1 (H:V), require a minimum of 1 ½ staples/yd^2. Check manufacturer's specifications to determine if a higher density staple pattern is required.

Installation in Channels

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Dig initial anchor trench 12 in. deep and 6 in. wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 in. deep and 6 in. wide across the channel at 25 to 30 ft intervals along the channels.
- Cut longitudinal channel anchor trenches 4 in. deep and 4 in. wide along each side of the installation to bury edges of matting, whenever possible extend matting 2 to 3 in. above the crest of the channel side slopes.

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- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 12 in. intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 in.
- Secure these initial ends of mats with anchors at 12 in. intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 3 in. overlap.
- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 12 in. intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for non-critical installations: Place two rows of anchors on 6 in. centers at 25 to 30 ft. intervals in lieu of excavated check slots.
- Staple shingled lap spliced ends a minimum of 12 in. apart on 12 in. intervals.
- Place edges of outside mats in previously excavated longitudinal slots; anchor using prescribed staple pattern, backfill, and compact soil.
- Anchor, fill, and compact upstream end of mat in a 12 in. by 6 in. terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil Filling (if specified for turf reinforcement mat (TRM))

Installation should be in accordance with the manufacturer's recommendations. Typical installation guidelines are as follows:

- After seeding, spread and lightly rake ½-3/4 inches of fine topsoil into the TRM apertures to completely fill TRM thickness. Use backside of rake or other flat implement.
- Alternatively, if allowed by product specifications, spread topsoil using lightweight loader, backhoe, or other power equipment. Avoid sharp turns with equipment.
- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes, or brooms for fine grading and touch up.
- Smooth out soil filling just exposing top netting of mat.

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Temporary Soil Stabilization Removal

- Temporary soil stabilization removed from the site of the work must be disposed of if necessary.

Costs

Installed costs can be relatively high compared to other BMPs. Approximate costs for installed materials are shown below:

Rolled Erosion Control Products		Installed Cost per Acre
Biodegradable	Jute Mesh	$7,700-$9,000
	Curled Wood Fiber	$10,200-$13,400
	Straw	$10,200-$13,400
	Wood Fiber	$10,200-$13,400
	Coconut Fiber	$16,600-$18,000
	Coconut Fiber Mesh	$38,400-$42,200
	Straw Coconut Fiber	$12,800-$15,400
Non-Biodegradable	Plastic Netting	$2,600-$2,800
	Plastic Mesh	$3,800-$4,500
	Synthetic Fiber with Netting	$43,500-$51,200
	Bonded Synthetic Fibers	$57,600-$70,400
	Combination with Biodegradable	$38,400-$46,100

Source: Cost information received from individual product manufacturers solicited by Geosyntec Consultants (2004). Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.

Inspection and Maintenance

- RECPs 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.
- Areas where erosion is evident shall be repaired and BMPs reapplied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require reapplication of BMPs.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Make sure matting is uniformly in contact with the soil.
- Check that all the lap joints are secure.
- Check that staples are flush with the ground.

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Erosion Control Pilot Study Report, State of California Department of Transportation (Caltrans), June 2000.

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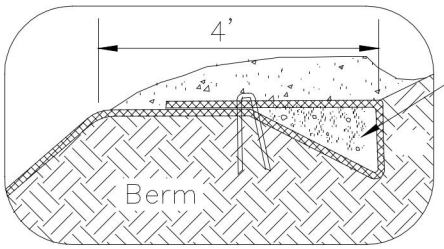
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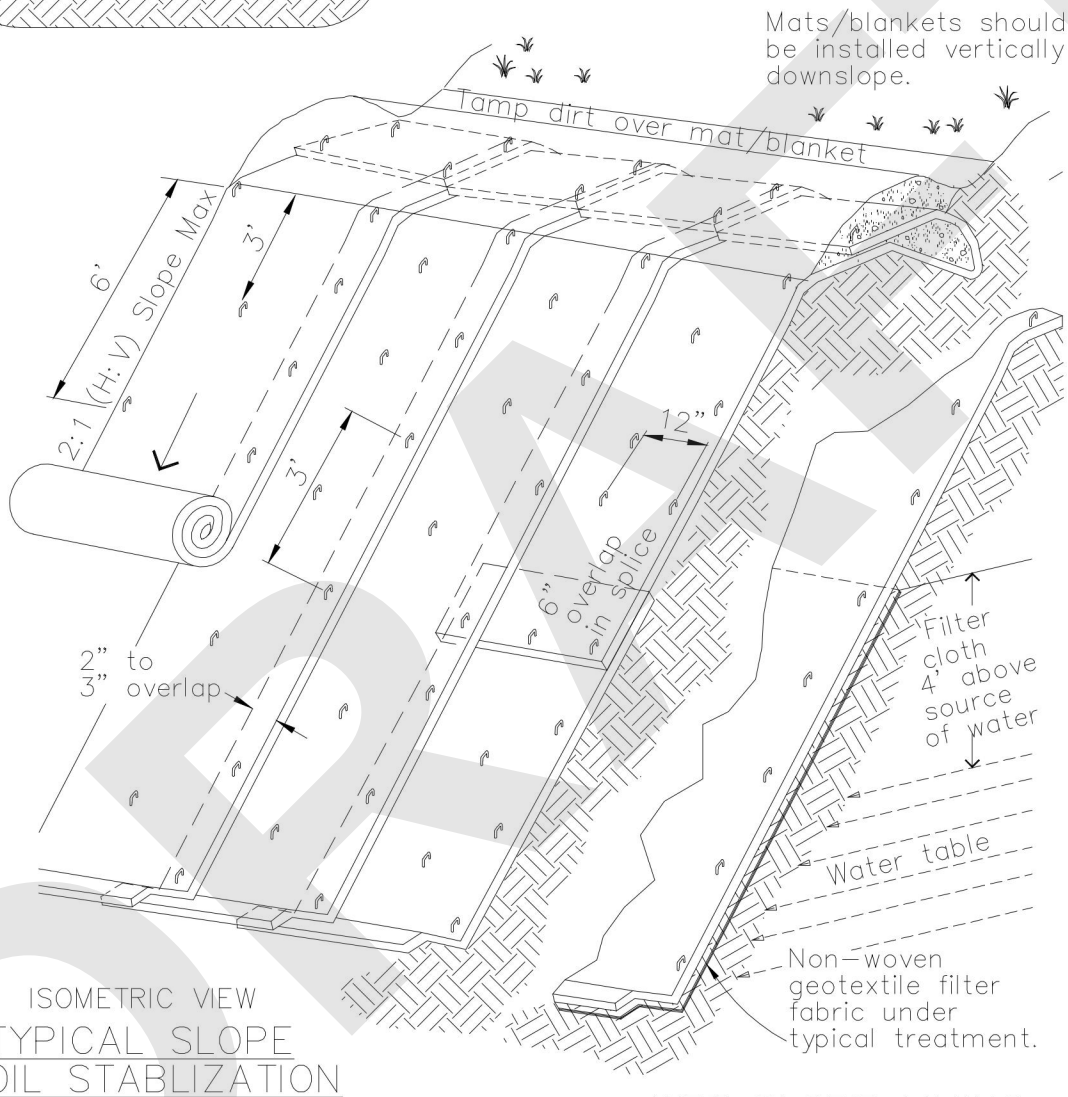
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ISOMETRIC VIEW

TYPICAL SLOPE SOIL STABLIZATION

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WET SLOPE LINING

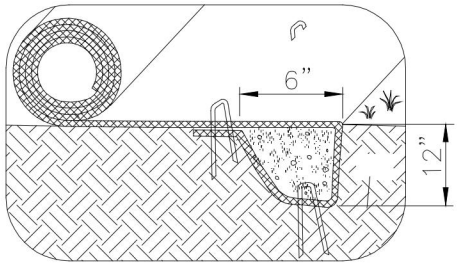
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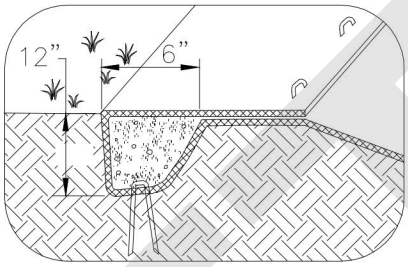
1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL

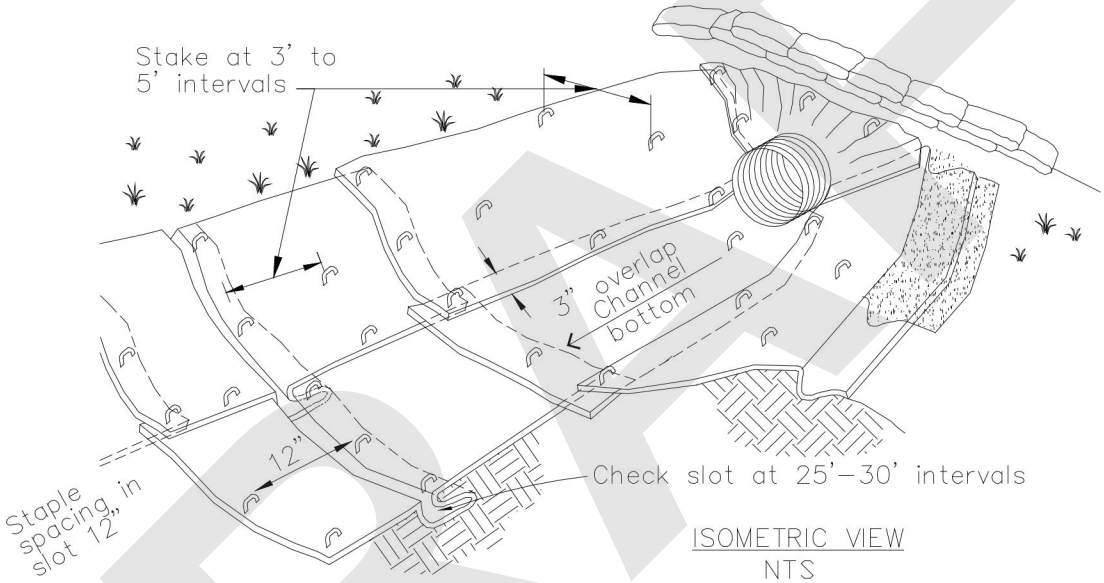
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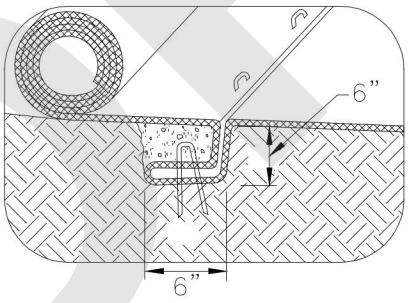
INITIAL CHANNEL ANCHOR TRENCH
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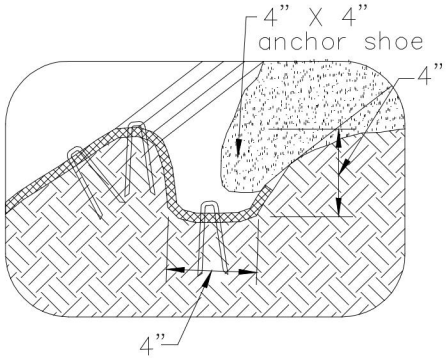
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH
NTS



ISOMETRIC VIEW
NTS



INTERMITTENT CHECK SLOT
NTS



LONGITUDINAL ANCHOR TRENCH
NTS

NOTES:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL

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Soil Preparation/Roughening EC-15



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	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-3 Hydraulic Mulch

EC-5 Soil Binders

EC-7 Geotextiles and Mats

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Description and Purpose

Soil Preparation/Roughening involves assessment and preparation of surface soils for BMP installation. This can include soil testing (for seed base, soil characteristics, or nutrients), as well as roughening surface soils by mechanical methods (including sheepsfoot rolling, track walking, scarifying, stair stepping, and imprinting) to prepare soil for additional BMPs, or to break up sheet flow. Soil Preparation can also involve tilling topsoil to prepare a seed bed and/or incorporation of soil amendments, to enhance vegetative establishment.

Suitable Applications

Soil preparation: Soil preparation is essential to proper vegetative establishment. In particular, soil preparation (i.e. tilling, raking, and amendment) is suitable for use in combination with any soil stabilization method, including Rolled Erosion Control Products (RECPs) or sod. Soil preparation should not be confused with roughening.

Roughening: Soil roughening is generally referred to as track walking (sometimes called imprinting) a slope, where treads from heavy equipment run parallel to the contours of the slope and act as mini terraces. Soil preparation is most effective when used in combination with erosion controls. Soil Roughening is suitable for use as a complementary process for controlling erosion on a site. Roughening is not intended to be used as a stand-alone BMP, and should be used with perimeter controls, additional erosion control measures, grade breaks, and vegetative establishment for maximum effectiveness. Roughening is intended to only affect surface soils and should not compromise slope stability or overall compaction. Suitable applications for soil roughening include:

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- Along any disturbed slopes, including temporary stockpiles, sediment basins, or compacted soil diversion berms and swales.

- Roughening should be used in combination with hydraulically applied stabilization methods, compost blanket, or straw mulch; but should not be used in combination with RECPs or sod because roughening is intended to leave terraces on the slope.

Limitations

- Preparation and roughening must take place prior to installing other erosion controls (such as hydraulically applied stabilizers) or sediment controls (such as fiber rolls) on the faces of slopes.

- In such cases where slope preparation is minimal, erosion control/revegetation BMPs that do not require extensive soil preparation - such as hydraulic mulching and seeding applications - should be employed.

- Consideration should be given to the type of erosion control BMP that follows surface preparation, as some BMPs are not designed to be installed over various types of tillage/roughening, i.e., RECPs should not be used with soil roughening due to a "bridging" effect, which suspends the blanket above the seed bed.

- Surface roughness has an effect on the amount of mulch material that needs to be applied, which shows up as a general increase in mulch material due to an increase in surface area (Topographic Index -see EC-3 Hydraulic Mulch).

Implementation

- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

General

A roughened surface can significantly reduce erosion. Based on tests done at the San Diego State Erosion Research Laboratory, various roughening techniques on slopes can result in a 12 - 76% reduction in the erosion rate versus smooth slopes.

Materials

Minimal materials are required unless amendments and/or seed are added to the soil. The majority of soil roughening/preparation can be done with equipment that is on hand at a normal construction site, such as bull dozers and compaction equipment.

Installation Guidelines

Soil Preparation

- Where appropriate or feasible, soil should be prepared to receive the seed by disking or otherwise scarifying the surface to eliminate crust, improve air and water infiltration and create a more favorable environment for germination and growth.

- Based upon soil testing conducted, apply additional soil amendments (e.g., fertilizers, additional seed) to the soil to help with germination. Follow EC-4, Hydroseeding, when selecting and applying seed and fertilizers.

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Cut Slope Roughening:

- Stair-step grade or groove the cut slopes that are steeper than 3:1.
- Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair-step grading.
- Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall.
- Do not make individual vertical cuts more than 2 ft. (0.6 m) high in soft materials or more than 3 ft. (0.9 m) high in rocky materials.
- Groove the slope using machinery to create a series of ridges and depressions that run across the slope, on the contour.

Fill Slope Roughening:

- Place on fill slopes with a gradient steeper than 3:1 in lifts not to exceed 8 in. (0.2 m), and make sure each lift is properly compacted.
- Ensure that the face of the slope consists of loose, uncompacted fill 4-6 in. (0.1-0.2 m) deep.
- Use grooving or tracking to roughen the face of the slopes, if necessary.
- Do not blade or scrape the final slope face.

Roughening for Slopes to be Mowed:

- Slopes that require mowing activities should not be steeper than 3:1.
- Roughen these areas to shallow grooves by track walking, scarifying, sheepsfoot rolling, or imprinting.
- Make grooves close together (less than 10 in.), and not less than 1 in. deep, and perpendicular to the direction of runoff (i.e., parallel to the slope contours).
- Excessive roughness is undesirable where mowing is planned.

Roughening with Tracked Machinery:

- Limit roughening with tracked machinery to soils with a sandy textural component to avoid undue compaction of the soil surface.
- Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.
- Seed and mulch roughened areas as soon as possible to obtain optimum seed germination and growth.

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Costs

Costs are based on the additional labor of tracking or preparation of the slope plus the cost of any required soil amendment materials.

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.
- Check the seeded slopes for signs of erosion such as rills and gullies. Fill these areas slightly above the original grade, then reseed and mulch as soon as possible.
- Inspect BMPs weekly during normal operations, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

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Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

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Non-Vegetative Stabilization EC-16



Categories

EC	Erosion Control	☑
SE	Sediment Control	☒
TR	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	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Non-vegetative stabilization methods are used for temporary or permanent stabilization of areas prone to erosion and should be used only where vegetative options are not feasible; examples include:

- Areas of vehicular or pedestrian traffic such as roads or paths;
- Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
- Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
- Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions.

Decomposed Granite (DG) is a permanent erosion protection method that consists of a layer of stabilized decomposed granite placed over an erodible surface.

Degradable Mulches of various types (see EC-3, EC-6, EC-8) can be used for temporary non-vegetative stabilization; examples include straw mulch, compost, wood chips or hydraulic mulch.

Geotextiles and Mats can be used for temporary non-vegetative stabilization (see EC-7). These BMPs are typically manufactured from degradable or synthetic materials and are

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designed and specified based on their functional longevity, i.e., how long they will persist and provide erosion protection. All geotextiles and mats should be replaced when they exceed their functional longevity or when permanent stabilization methods are instituted.

Gravel Mulch is a non-degradable erosion control product that is composed of washed and screened coarse to very coarse gravel, 16 mm to 64 mm (0.6" - 2.5"), similar to an AASHTO No. 3 coarse aggregate.

Rock Slope Protection consists of utilizing large rock or rip-rap (4"- 24") to stabilize slopes with a high erosion potential and those subject to scour along waterways.

Soil Binders can be used for temporary non-vegetative stabilization (see EC-5). The key to their use is functional longevity. In most cases, the soil binder will need to be routinely monitored and re-applied to maintain an erosion-resistant coverage.

Suitable Applications

Non-vegetated stabilization methods are suitable for use on disturbed soil areas and on material stockpiles that need to be temporarily or permanently protected from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established in the required timeframe, due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

Decomposed Granite (DG) and Gravel Mulch are suitable for use in areas where vegetation establishment is difficult, on flat surfaces, trails and pathways, and when used in conjunction with a stabilizer or tackifier, on shallow slopes (i.e., 10:1 [H:V]). DG and gravel can also be used on shallow rocky slopes where vegetation cannot be established for permanent erosion control.

Degradable Mulches can be used to cover and protect soil surfaces from erosion both in temporary and permanent applications. In many cases, the use of mulches by themselves requires routine inspection and re-application. See EC-3 Hydraulic Mulch, EC-6 Straw Mulch, EC-8 Wood Mulch, or EC-14 Compost Blankets for more information.

Geotextiles and Mats can be used as a temporary stand-alone soil stabilization method. Depending on material selection, geotextiles and mats can be a short-term (3 mos – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats.

Rock Slope Protection can be used when the slopes are subject to scour or have a high erosion potential, such as slopes adjacent to flowing waterways or slopes subject to overflow from detention facilities (spillways).

Soil Binders can be used for temporary stabilization of stockpiles and disturbed areas not subject to heavy traffic. See EC-5 Soil Binders for more information.

Limitations

General

- Refer to EC-3, EC-6, EC-8, and EC-14 for limitations on use of mulches. Refer to EC-7 for limitations on use of geotextiles and mats. Refer to EC-5 for limitations on use of Soil Binders.

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Decomposed Granite

- Not available in some geographic regions.
- If not tackified, material may be susceptible to erosion even on slight slopes (e.g., 30:1 [H:V]).
- Installed costs may be more expensive than vegetative stabilization methods.

Gravel Mulch

- Availability is limited in some geographic regions.
- If not properly screened and washed, can contain fine material that can erode and/or create dust problems.
- If inadequately sized, material may be susceptible to erosion on sloped areas.
- Pore spaces fill with dirt and debris over time; may provide a growing medium for weeds.

Rock Slope Protection

- Installation is labor intensive.
- Installed costs can be significantly higher than vegetative stabilization methods.
- Rounded stones may not be used on slopes greater than 2:1 [H:V].

Implementation

General

Non-vegetated stabilization should be used in accordance with the following general guidance:

- Should be used in conjunction with other BMPs, including drainage, erosion controls and sediment controls.
- Refer to EC-3, EC-6, EC-8, and EC-14 for implementation details for mulches. Refer to EC-7 for implementation details for geotextiles and mats. Refer to EC-5 for implementation details for soil binders.
- Non-vegetated stabilization measures should be implemented as soon as the disturbance in the areas they are intended to protect has ceased.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

Decomposed Granite Stabilization

- If used for a road or path should be installed on a prepared base.
- Should be mixed with a stabilizer if used for roads or pathways, or on slope applications.
- Though porous it is recommended to prevent standing water on or next to a decomposed granite road or pathway.

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Gravel Mulch

- Should be sized based on slope, rainfall, and upgradient run-on conditions. Stone size should be increased as potential for erosion increases (steeper slopes, high intensity rainfall).
- If permanent, a weed control fabric should be placed prior to installation.
- Should be installed at a minimum 2" depth.
- Should completely cover all exposed surfaces.

Rock Slope Protection

- Rock slope protection installation should follow Caltrans Standard Specification 72-2: Rock Slope Protection. Refer to the specification for rock conformity requirements and installation methods.
- When using rock slope protection, rock size and installation method should be specified by an Engineer.
- A geotextile fabric should be placed prior to installation.

Costs

- Costs are highly variable depending not only on technique chosen, but also on materials chosen within specific techniques. In addition, availability of certain materials will vary by region/location, which will also affect the cost. Costs of mulches, geotextiles and mats, and soil binders are presented in their respective fact sheets. Costs for decomposed granite, gravel mulch stabilization and rock slope protection may be higher depending on location and availability of materials. Caltrans has provided an estimate for gravel mulch of \$13 - \$20/yd^2 in flat areas and \$14 - \$30/yd^2 on side slopes (adjusted for inflation, 2016 dollars).

Inspection and Maintenance

General

- 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.
- For permanent installation, require inspection periodically and after major storm events to look for signs of erosion or damage to the stabilization.
- All damage should be repaired immediately.
- Refer to EC-3, EC-6, EC-8, and EC-14 for inspection and maintenance requirements for mulches. Refer to EC-7 for inspection and maintenance requirements for geotextiles and mats. Refer to EC-5 for inspection and maintenance requirements for soil binders.

Decomposed Granite and Gravel Mulch Stabilization

- Rake out and add decomposed granite or gravel as needed to areas subject to rill erosion. Inspect upgradient drainage controls and repair/modify as necessary.

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- Should remain stable under loose surface material. Any significant problem areas should be repaired to restore uniformity to the installation.

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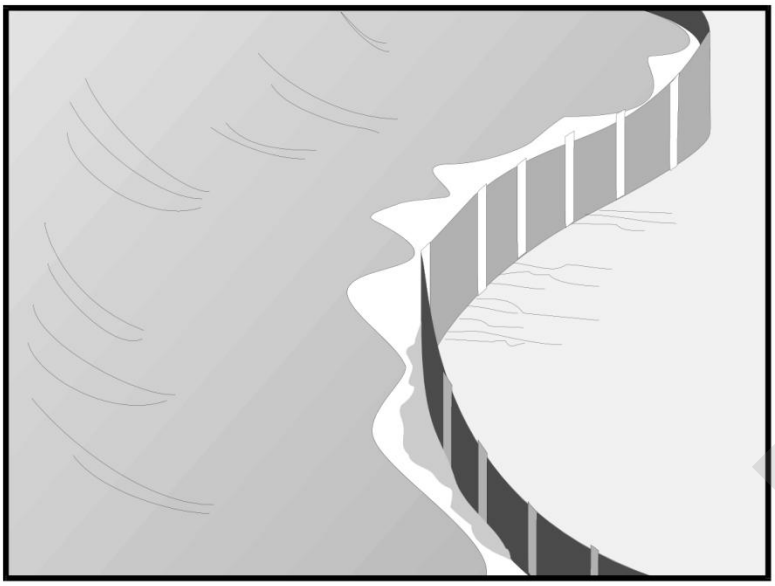
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Silt Fence SE-1



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	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains water, promoting sedimentation of coarse sediment behind the fence. Silt fence does not retain soil fine particles like clays or silts.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (Storm Drain Inlet Protection, SE-10). Silt fences should not be used in locations where the flow is concentrated. Silt fences should always be used in combination with erosion controls. Suitable applications include:

- At perimeter of a project (although they should not be installed up and down slopes).
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

Targeted Constituents

Sediment (coarse sediment)	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm SE-12 Manufactured Linear Sediment Controls

SE-13 Compost Socks and Berms

SE-14 Biofilter Bags

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Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard.
- Do not use silt fence to divert water flows or place across any contour line.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Must be trenched and keyed in.
- According to the State Water Board's *CGP Review, Issue #2* (2014), silt fences reinforced with metal or plastic mesh should be avoided due to plastic pollution and wildlife concerns.
- Not intended for use as a substitute for Fiber Rolls (SE-5), when fiber rolls are being used as a slope interruption device.
- Do not use on slopes subject to creeping, slumping, or landslides.

Implementation

General

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap coarse sediment by intercepting and detaining sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Silt fence should be used in combination with erosion controls up-slope in order to provide the most effective sediment control.
- Silt fence alone is not effective at reducing turbidity. (Barrett and Malina, 2004)
- Designers should consider diverting sediment laden water to a temporary sediment basin or trap. (EPA, 2012)
- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft. at any point along the silt fence.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft.^{2} of ponding area should be provided for every acre draining to the fence.
- Efficiency of silt fences is primarily dependent on the detention time of the runoff behind the control. (Barrett and Malina, 2004)

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- The drainage area above any fence should not exceed a quarter of an acre. (Rule of Thumb- 100-feet of silt fence per 10,000 ft.^{2} of disturbed area.) (EPA, 2012)
- The maximum length of slope draining to any point along the silt fence should be 100 ft. per ft of silt fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area draining to the silt fence is permanently stabilized, after which, the silt fence fabric and posts should be removed and properly disposed.
- J-hooks, which have ends turning up the slope to break up long runs of fence and provide multiple storage areas that work like mini-retention areas, may be used to increase the effectiveness of silt fence.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

Design and Layout

In areas where high winds are anticipated the fence should be supported by a plastic or wire mesh. The geotextile fabric of the silt fence should contain ultraviolet inhibitors and stabilizers to provide longevity equivalent to the project life or replacement schedule.

- Layout in accordance with the attached figures.
- For slopes that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to protect silt fence from rocks (e.g., rockfall netting) ensure the integrity of the silt fence installation.

Standard vs. Heavy Duty Silt Fence

Standard Silt Fence

- Generally applicable in cases where the area draining to fence produces moderate sediment loads.

Heavy Duty Silt Fence

- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
- Use is generally limited to areas affected by high winds.
- Area draining to fence produces moderate sediment loads.

Materials

Standard Silt Fence

- Silt fence material should be woven geotextile with a minimum width of 36 in. The fabric should conform to the requirements in ASTM designation D6461.

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- Wooden stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15-gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts instead of wood stakes.

Installation Guidelines – Traditional Method

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).

- Bottom of the silt fence should be keyed-in a minimum of 12 in.

- Posts should be spaced a maximum of 6 ft. apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.

- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy–duty wire staples at least 1 in. long. The mesh should extend into the trench.

- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.

- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.

- The trench should be backfilled with native material and compacted.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.

- Cross barriers should be a minimum of 1/3 and a maximum of ½ the height of the linear barrier.

- See typical installation details at the end of this fact sheet.

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Installation Guidelines - Static Slicing Method

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 in. into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the geotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
    - Ease of installation (most often done with a 2-person crew).
    - Minimal soil disturbance.
    - Better level of compaction along fence, less susceptible to undercutting
    - Uniform installation.
- Limitations:
    - Does not work in shallow or rocky soils.
    - Complete removal of geotextile material after use is difficult.
    - Be cautious when digging near potential underground utilities.

Costs

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is $7 per linear foot based on vendor research. Range of cost is $3.50 - $9.10 per linear foot.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches 1/3 of the barrier height.

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- Silt fences should be left in place until the upgradient area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.
- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

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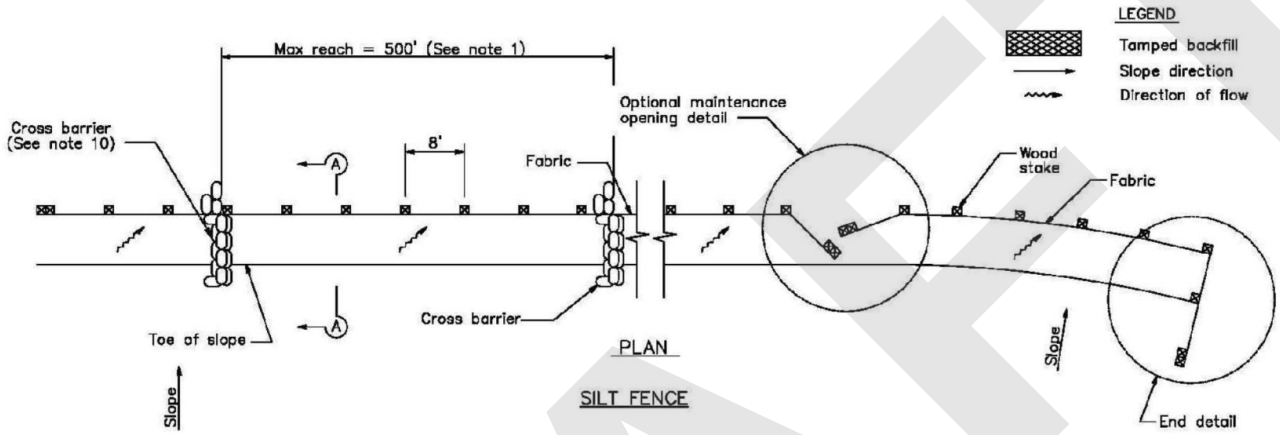
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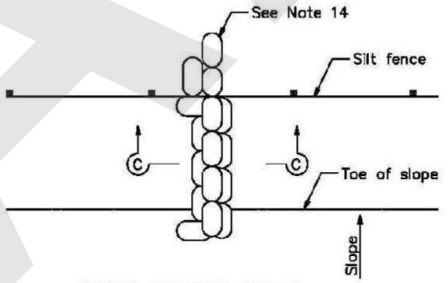
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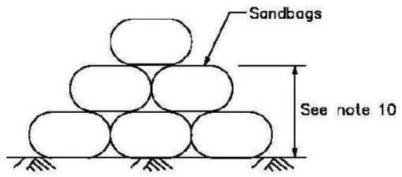


NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'–0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'–0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow–through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3–4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.

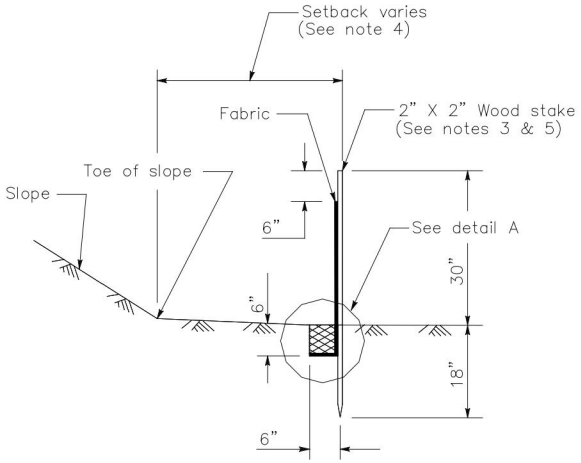


CROSS BARRIER DETAIL

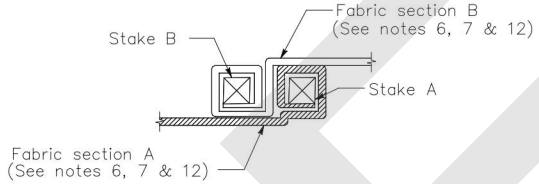


SECTION C–C

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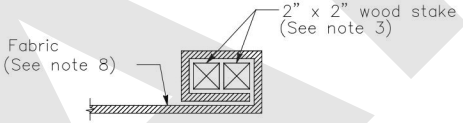


SECTION A–A

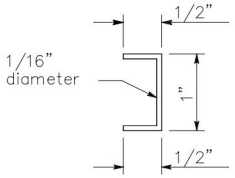


JOINING SECTION DETAIL (TOP VIEW)

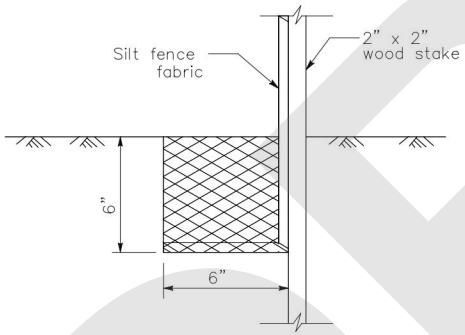




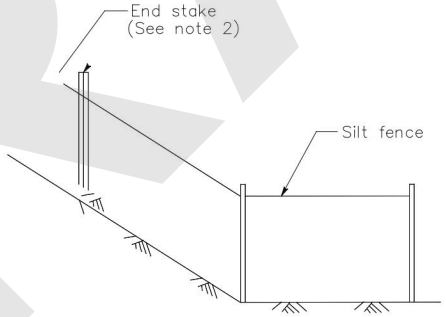
END STAKE DETAIL (TOP VIEW)



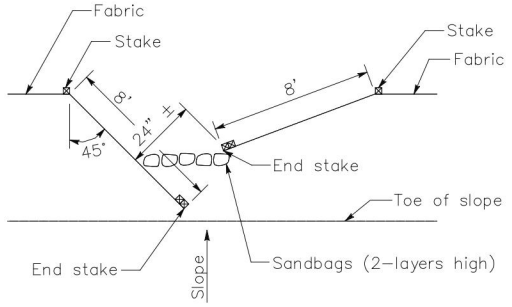
STAPLE DETAIL
(SEE NOTE 9)



DETAIL A

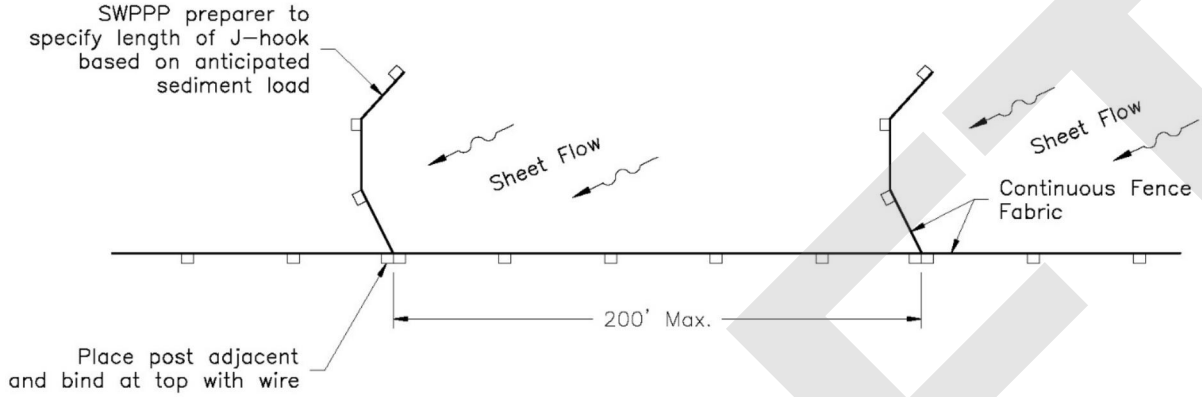


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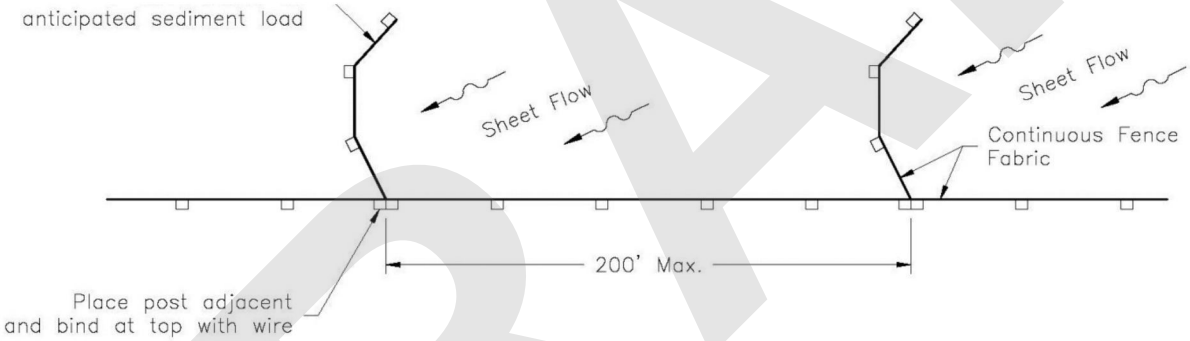
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)

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Plan

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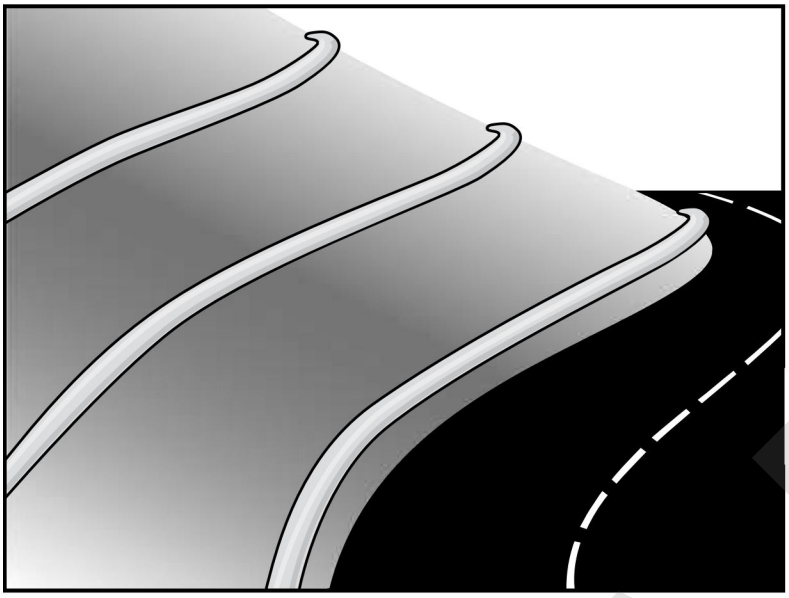


Plan

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Fiber Rolls SE-5



Description and Purpose

A fiber roll (also known as wattles or logs) consists of straw, coir, curled wood fiber, or other biodegradable materials bound into a tight tubular roll wrapped by plastic netting, which can be photodegradable, or natural fiber, such as jute, cotton, or sisal. 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.

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	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

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- At operational storm drains as a form of inlet protection.
- Around temporary stockpiles.

Limitations

- Fiber rolls should be used in conjunction with erosion control, such as hydroseed, RECPs, etc.
- Only biodegradable fiber rolls containing no plastic can remain on a site applying for a Notice of Termination due to plastic pollution and wildlife concerns (State Water Board, 2016). Fiber rolls containing plastic that are used on a site must be disposed of for final stabilization.
- Fiber rolls are not effective unless trenched in and staked. If not properly staked and trenched in, fiber rolls will not work as intended and could be transported by high flows.
- Not intended for use in high flow situations (i.e., for concentrated flows).
- Difficult to move once saturated.
- Fiber rolls have a 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 and roll material.

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, curled wood fiber, or coir bound into a tight tubular roll by netting or natural fiber (see *Limitations* above regarding plastic netting).
- Typical fiber rolls vary in diameter from 6 in. to 20 in. Larger diameter rolls are available as well. The larger the roll, the higher the sediment retention capacity.
- Typical fiber rolls lengths are 4, 10, 20 and 25 ft., although other lengths are likely available.

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.

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- 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 ¼ to 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). Fiber rolls encased with plastic netting or containing any plastic material will need to be removed from the site for final stabilization. Fiber rolls used in a permanent application are to be encased with a non-plastic material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance; therefore, during the BMP planning phase, the areas where fiber rolls will be used on final slopes, only fiber rolls wrapped in non-plastic material should be selected.
- 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.

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Costs

Material costs for straw fiber rolls range from $26 - $38 per 25-ft. roll[1] and curled wood fiber rolls range from $30 - $40 per roll[2].

Material costs for PAM impregnated fiber rolls range between $9.00-$12.00 per linear foot, based upon vendor research[1] .

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

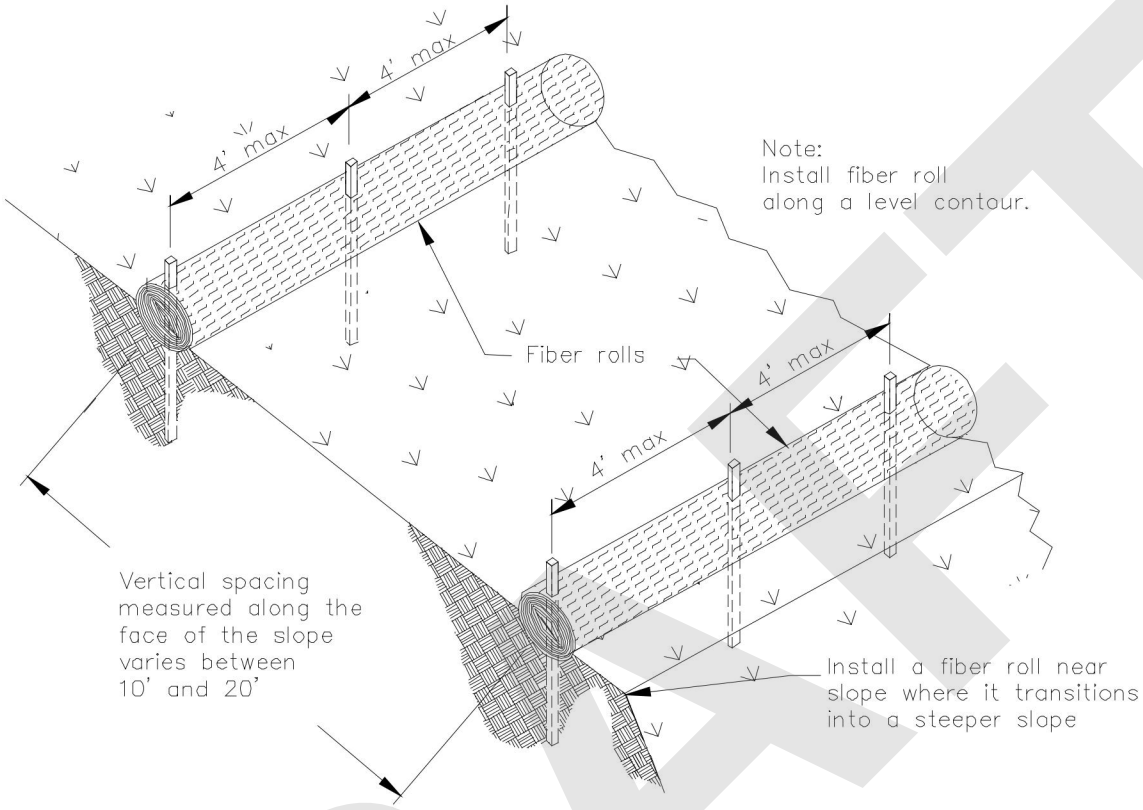
General Construction – Frequently Asked Questions, Storm Water Program website, State Water Resources Control Board, 2009 updated in 2016. Available online at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/gen_const_faq.shtml.

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

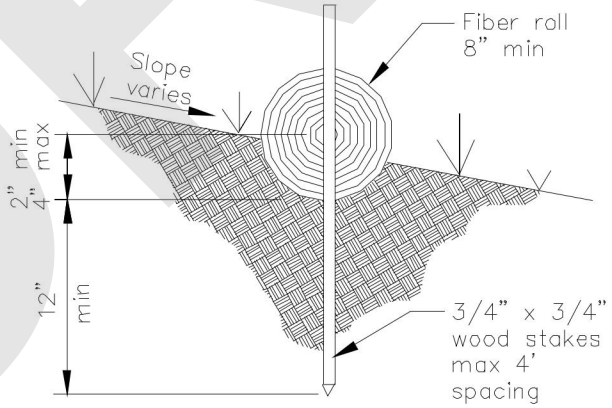
Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

[1] Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.
[2] Costs estimated based on vendor query by Tetra Tech, Inc. 2016.

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TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.

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Street Sweeping and Vacuuming SE-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	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

- Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).
- Sweeping may be less effective for fine particle soils (i.e., clay).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused and perhaps save money.
- Inspect potential sediment tracking locations daily.

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- Visible sediment tracking should be swept or vacuumed on a daily basis.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from $ 650/day to $2,500/day[1], plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

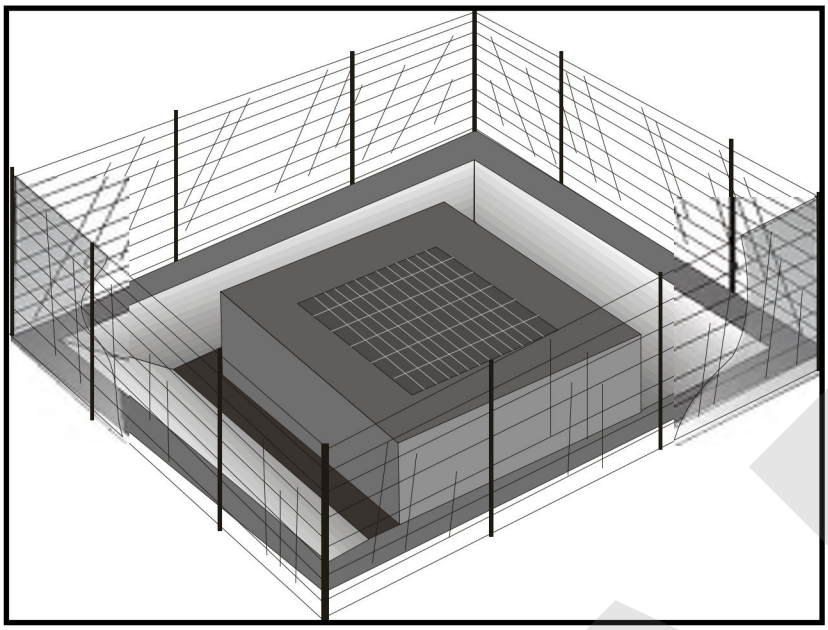
References

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

[1] Based on contractor query conducted by Tetra Tech, Inc. November 2016.

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Storm Drain Inlet Protection SE-10



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	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms

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Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

- Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Sediment removal may be inadequate to prevent sediment discharges in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use

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other onsite sediment trapping techniques in conjunction with inlet protection.

- Frequent maintenance is required.
- Limit drainage area to 1 acre maximum. For drainage areas larger than 1 acre, runoff should be routed to a sediment-trapping device designed for larger flows. See BMPs SE-2, Sediment Basin, and SE-3, Sediment Traps.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected, and overflow capability is needed.

Implementation

General

Inlet control measures presented in this handbook should not be used for inlets draining more than one acre. Runoff from larger disturbed areas should be first routed through SE-2, Sediment Basin or SE-3, Sediment Trap and/or used in conjunction with other drainage control, erosion control, and sediment control BMPs to protect the site. Different types of inlet protection are appropriate for different applications depending on site conditions and the type of inlet. Alternative methods are available in addition to the methods described/shown herein such as prefabricated inlet insert devices, or gutter protection devices.

Design and Layout

Identify existing and planned storm drain inlets that have the potential to receive sediment-laden surface runoff. Determine if storm drain inlet protection is needed and which method to use.

- The key to successful and safe use of storm drain inlet protection devices is to know where runoff that is directed toward the inlet to be protected will pond or be diverted as a result of installing the protection device.
  - Determine the acceptable location and extent of ponding in the vicinity of the drain inlet. The acceptable location and extent of ponding will influence the type and design of the storm drain inlet protection device.
  - Determine the extent of potential runoff diversion caused by the storm drain inlet protection device. Runoff ponded by inlet protection devices may flow around the device and towards the next downstream inlet. In some cases, this is acceptable; in other cases, serious erosion or downstream property damage can be caused by these diversions. The possibility of runoff diversions will influence whether or not storm drain inlet protection is suitable; and, if suitable, the type and design of the device.
- The location and extent of ponding, and the extent of diversion, can usually be controlled through appropriate placement of the inlet protection device. In some cases, moving the inlet protection device a short distance upstream of the actual inlet can provide more efficient sediment control, limit ponding to desired areas, and prevent or control diversions.
- Seven types of inlet protection are presented below. However, it is recognized that other effective methods and proprietary devices exist and may be selected.

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- Silt Fence: Appropriate for drainage basins with less than a 5% slope, sheet flows, and flows under 0.5 cfs.
- Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (SE-3).
- Gravel bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.
- Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.
- Temporary Geotextile Storm drain Inserts: Different products provide different features. Refer to manufacturer details for targeted pollutants and additional features.
- Biofilter Bag Barrier: Used to create a small retention area upstream of inlets and can be located on pavement or soil. Biofilter bags slowly filter runoff allowing sediment to settle out. Appropriate for flows under 0.5 cfs.
- Compost Socks: Allow filtered run-off to pass through the compost while retaining sediment and potentially other pollutants (SE-13). Appropriate for flows under 1.0 cfs.

- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.
- Provide area around the inlet for water to pond without flooding structures and property.
- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps (where needed) 1 to 2 ft with 2:1 side slopes around the inlet.

Installation

- ***DI Protection Type 1 - Silt Fence -*** Similar to constructing a silt fence; see BMP SE-1, Silt Fence. Do not place fabric underneath the inlet grate since the collected sediment may fall into the drain inlet when the fabric is removed or replaced and water flow through the grate will be blocked resulting in flooding. See typical Type 1 installation details at the end of this fact sheet.

1. Excavate a trench approximately 6 in. wide and 6 in. deep along the line of the silt fence inlet protection device.
2. Place 2 in. by 2 in. wooden stakes around the perimeter of the inlet a maximum of 3 ft apart and drive them at least 18 in. into the ground or 12 in. below the bottom of the trench. The stakes should be at least 48 in.
3. Lay fabric along bottom of trench, up side of trench, and then up stakes. See SE-1, Silt Fence, for details. The maximum silt fence height around the inlet is 24 in.
4. Staple the filter fabric (for materials and specifications, see SE-1, Silt Fence) to wooden stakes. Use heavy-duty wire staples at least 1 in. in length.

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5. Backfill the trench with gravel or compacted earth all the way around.

- ***DI Protection Type 2 - Excavated Drop Inlet Sediment Trap -*** Install filter fabric fence in accordance with DI Protection Type 1. Size excavated trap to provide a minimum storage capacity calculated at the rate 67 yd^3/acre of drainage area. See typical Type 2 installation details at the end of this fact sheet.

- ***DI Protection Type 3 - Gravel bag -*** Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with SE-6, Gravel Bag Berm. Gravel bags should be used due to their high permeability. See typical Type 3 installation details at the end of this fact sheet.

  1. Construct on gently sloping street.

  2. Leave room upstream of barrier for water to pond and sediment to settle.

  3. Place several layers of gravel bags – overlapping the bags and packing them tightly together.

  4. Leave gap of one bag on the top row to serve as a spillway. Flow from a severe storm (e.g., 10-year storm) should not overtop the curb.

- ***DI Protection Type 4 – Block and Gravel Filter -*** Block and gravel filters are suitable for curb inlets commonly used in residential, commercial, and industrial construction. See typical Type 4 installation details at the end of this fact sheet.

  1. Place hardware cloth or comparable wire mesh with 0.5 in. openings over the drop inlet so that the wire extends a minimum of 1 ft beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place woven geotextile over the wire mesh.

  2. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 in., 8 in., and 12 in. wide. The row of blocks should be at least 12 in. but no greater than 24 in. high.

  3. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with 0.5 in. opening.

  4. Pile washed stone against the wire mesh to the top of the blocks. Use 0.75 to 3 in.

- ***DI Protection Type 5 – Temporary Geotextile Insert (proprietary)*** – Many types of temporary inserts are available. Most inserts fit underneath the grate of a drop inlet or inside of a curb inlet and are fastened to the outside of the grate or curb. These inserts are removable, and many can be cleaned and reused. Installation of these inserts differs between manufacturers. Please refer to manufacturer instruction for installation of proprietary devices.

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- ***DI Protection Type 6 - Biofilter bags*** – Biofilter bags may be used as a substitute for gravel bags in low-flow situations. Biofilter bags should conform to specifications detailed in SE-14, Biofilter bags.

    1. Construct in a gently sloping area.
    2. Biofilter bags should be placed around inlets to intercept runoff flows.
    3. All bag joints should overlap by 6 in.
    4. Leave room upstream for water to pond and for sediment to settle out.
    5. Stake bags to the ground as described in the following detail. Stakes may be omitted if bags are placed on a paved surface.

- ***DI Protection Type 7 – Compost Socks*** – A compost sock can be assembled on site by filling a mesh sock (e.g., with a pneumatic blower). Compost socks do not require special trenching compared to other sediment control methods (e.g., silt fence). Compost socks should conform to specification detailed in SE-13, Compost Socks and Berms.

Costs

- Average annual cost for installation and maintenance of DI Type 1-4 and 6 (one-year useful life) is $200 per inlet.
- Temporary geotextile inserts are proprietary, and cost varies by region. These inserts can often be reused and may have greater than 1 year of use if maintained and kept undamaged. Average cost per insert ranges from $50-75 plus installation, but costs can exceed $100. This cost does not include maintenance.
- See SE-13 for Compost Sock cost information.

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.
- Silt Fences. If the fabric becomes clogged, torn, or degrades, it should be replaced. Make sure the stakes are securely driven in the ground and are in good shape (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes. At a minimum, remove the sediment behind the fabric fence when accumulation reaches one-third the height of the fence or barrier height.
- Gravel Filters. If the gravel becomes clogged with sediment, it should be carefully removed from the inlet and either cleaned or replaced. Since cleaning gravel at a construction site may be difficult, consider using the sediment-laden stone as fill material and put fresh stone around the inlet. Inspect bags for holes, gashes, and snags, and replace bags as needed. Check gravel bags for proper arrangement and displacement.

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- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Inspect and maintain temporary geotextile insert devices according to manufacturer's specifications.
- Remove storm drain inlet protection once the drainage area is stabilized.
    - Clean and regrade area around the inlet and clean the inside of the storm drain inlet, as it should be free of sediment and debris at the time of final inspection.

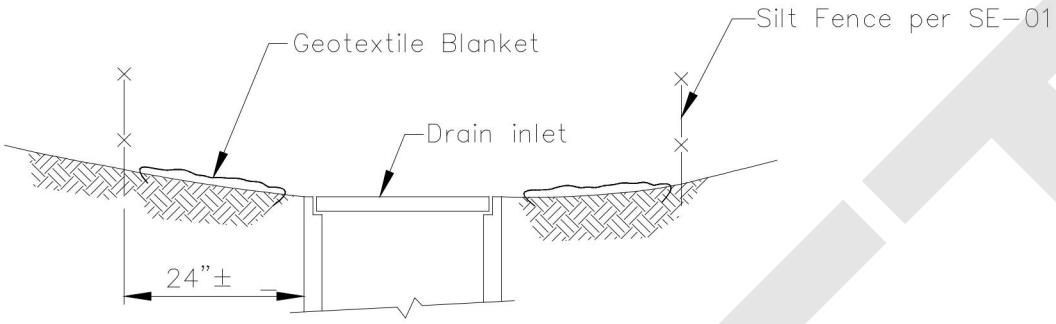
References

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

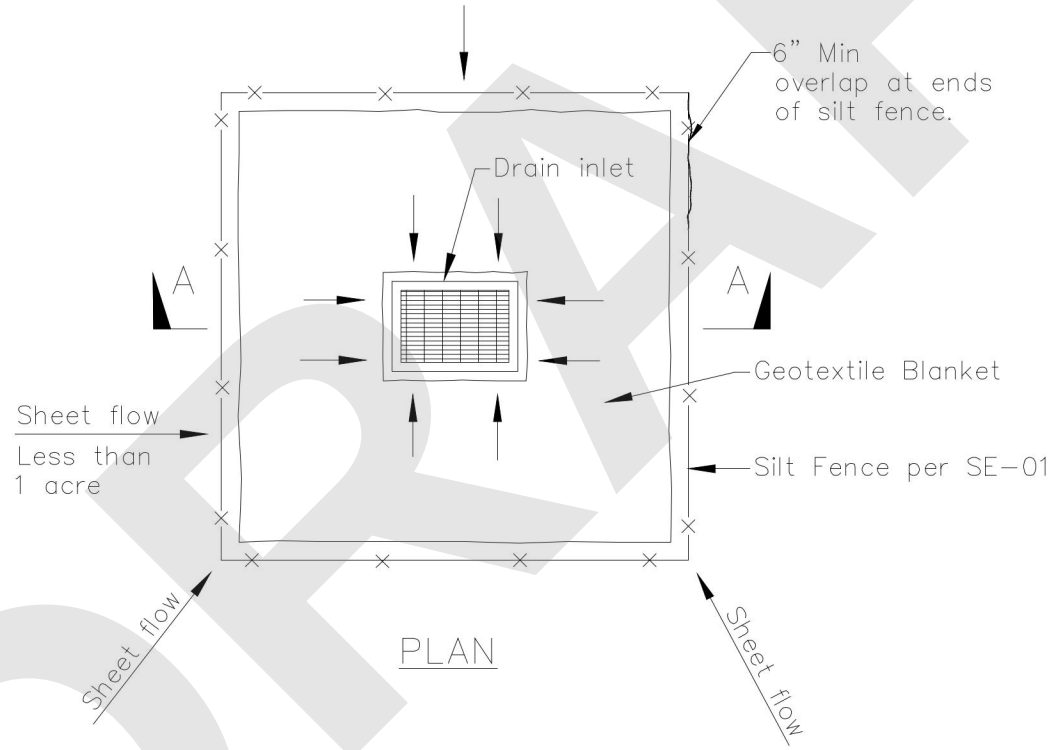
Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

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

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SECTION A–A



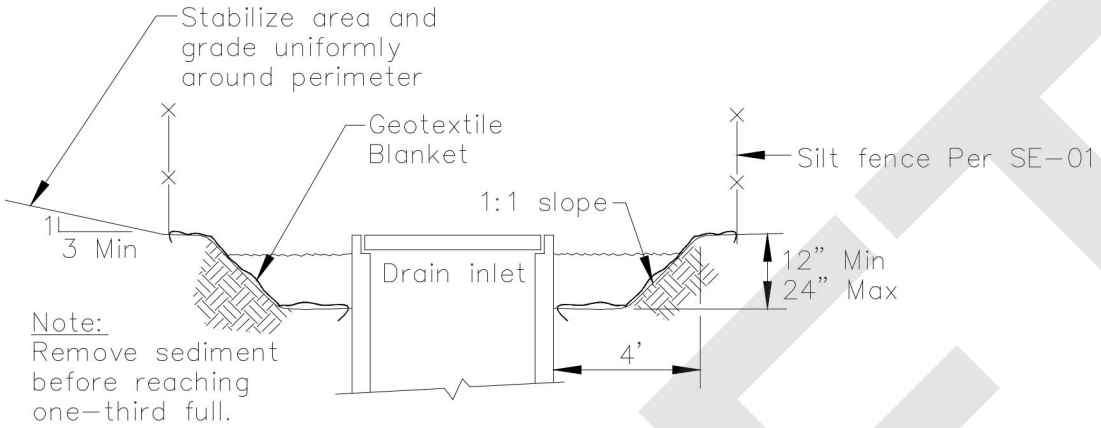
PLAN

DI PROTECTION TYPE 1
NOT TO SCALE

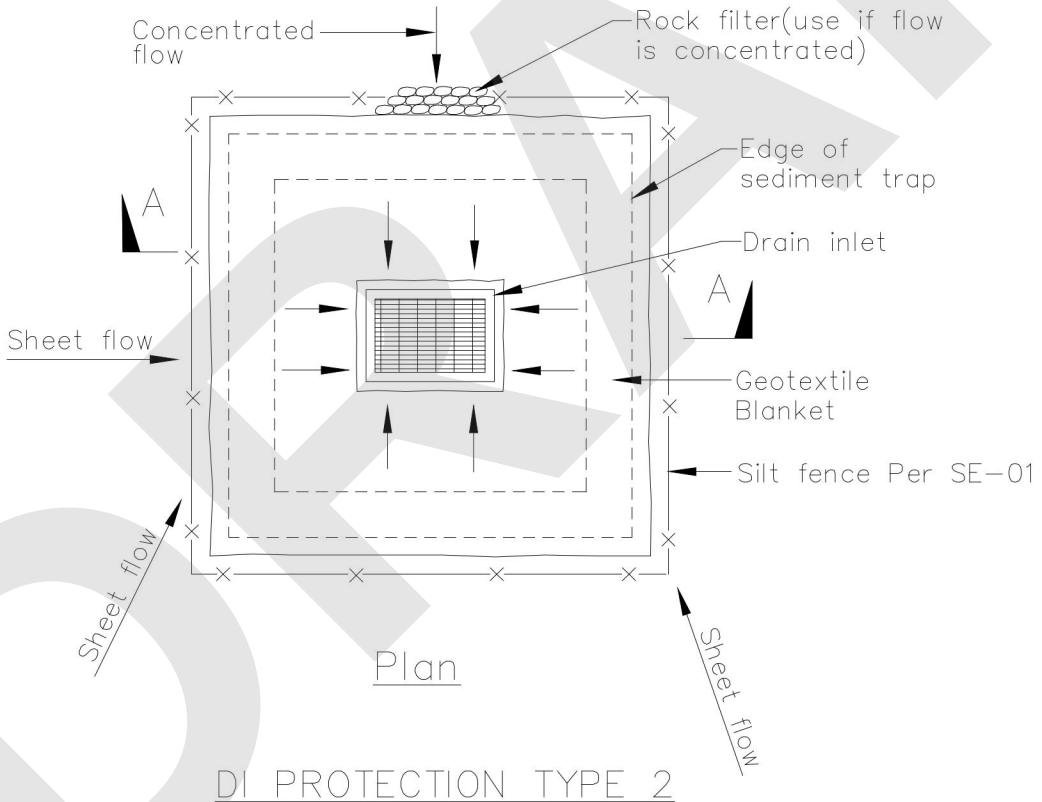
NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.

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Section A–A

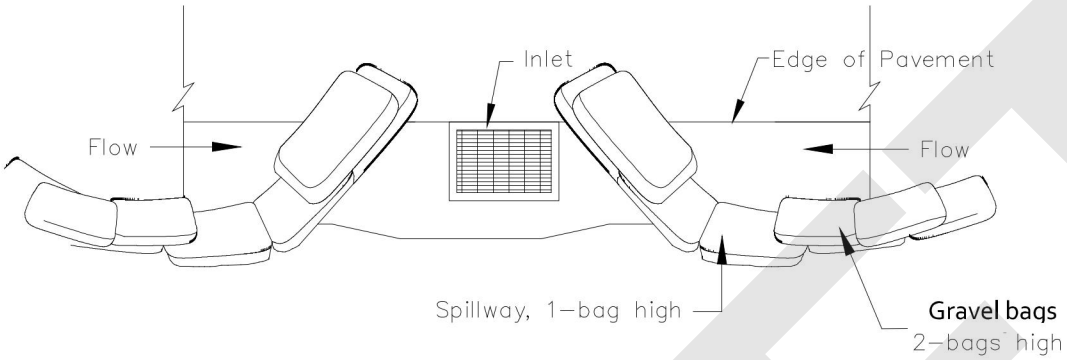


Plan

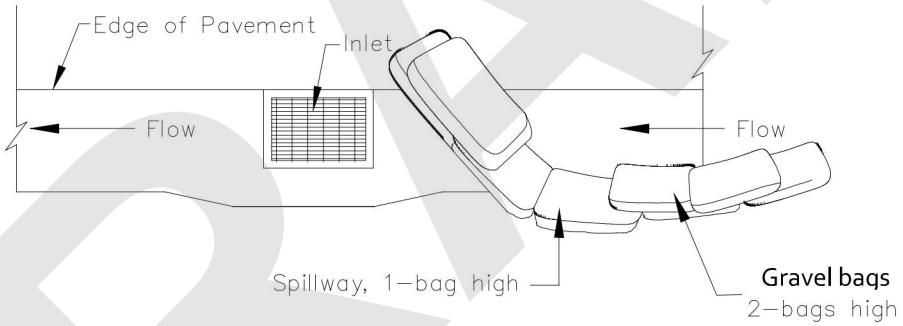
DI PROTECTION TYPE 2
NOT TO SCALE

Notes
1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.

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TYPICAL PROTECTION FOR INLET ON SUMP



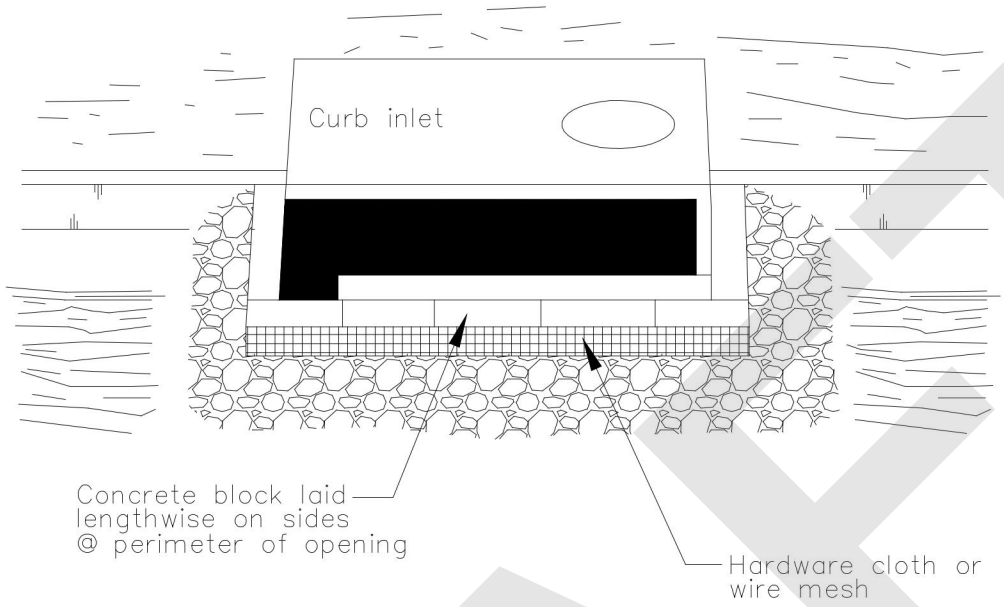
TYPICAL PROTECTION FOR INLET ON GRADE

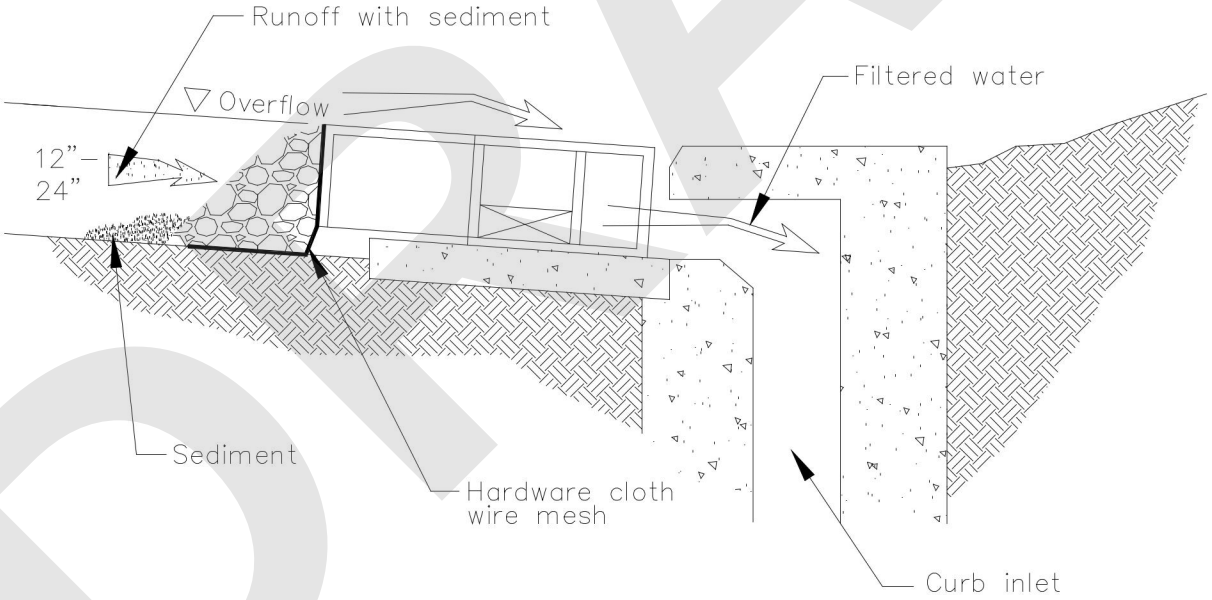
NOTES:

1. Intended for short–term use.
2. Use to inhibit non–storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed
5. Not applicable in areas with high silts and clays without filter fabric.
6. Protection can be effective even if it is not immediately adjacent to the inlet provided that the inlet is protected from potential sources of pollution.

DI PROTECTION TYPE 3
NOT TO SCALE

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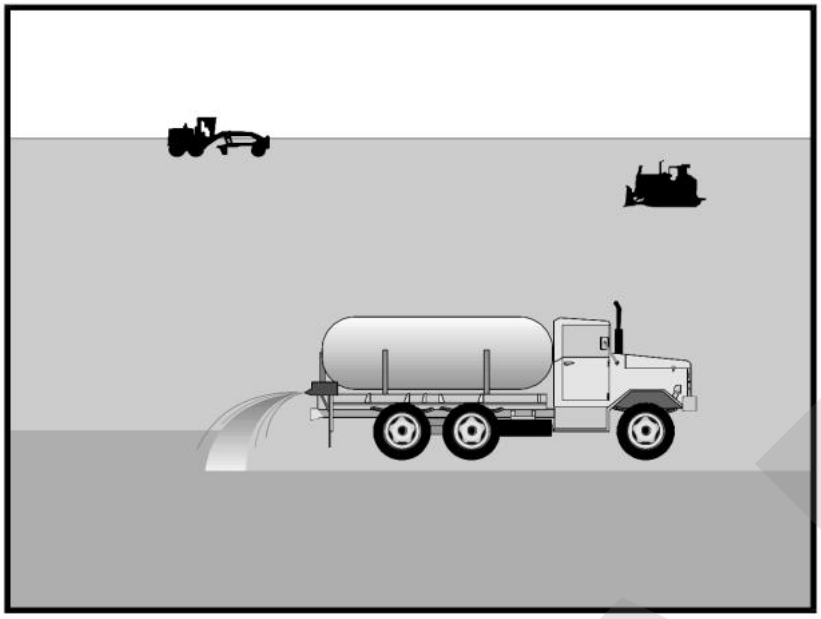




DI PROTECTION – TYPE 4
NOT TO SCALE

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Wind Erosion Control WE-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	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

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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:

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- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

Implementation

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

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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, vinyl, 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

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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.

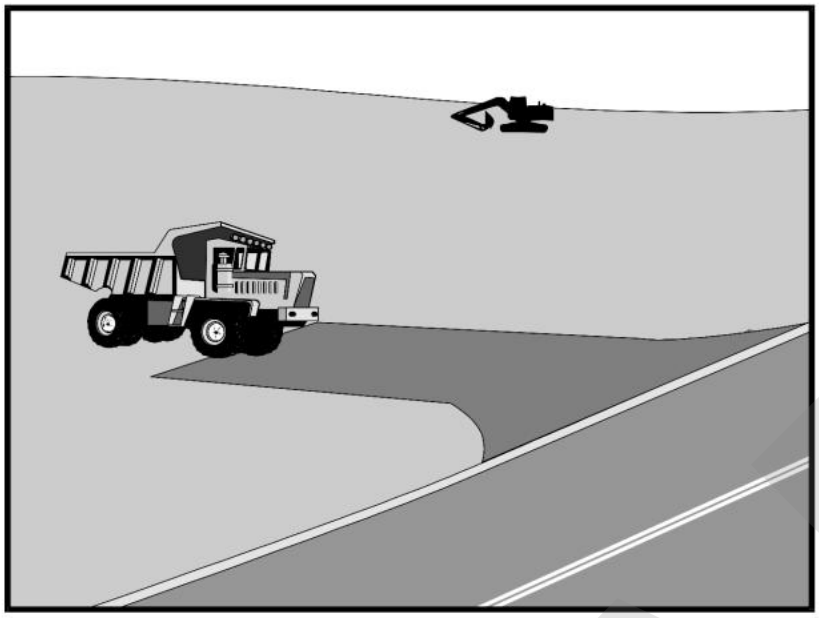
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Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

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

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Stabilized Construction Entrance/Exit TC-1



Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Stabilized Construction Entrance/Exit TC-1

Implementation

General

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft or maximum site will allow, and 10 ft minimum width or to accommodate traffic.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.

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Stabilized Construction Entrance/Exit TC-1

- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,500 to $6,100 each, averaging $3,100 per entrance. Costs will increase with addition of washing rack and sediment trap. With wash rack, costs range from $1,500 - $7,700 each, averaging $4,600 per entrance (All costs adjusted for inflation, 2016 dollars, by Tetra Tech Inc.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

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National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

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

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

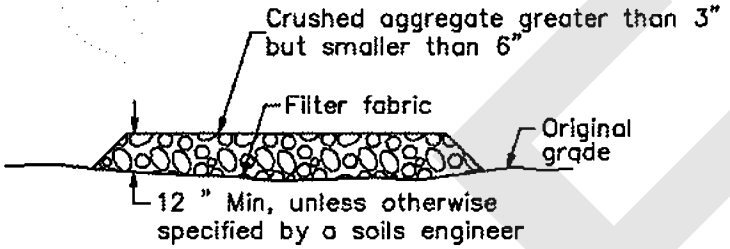
Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

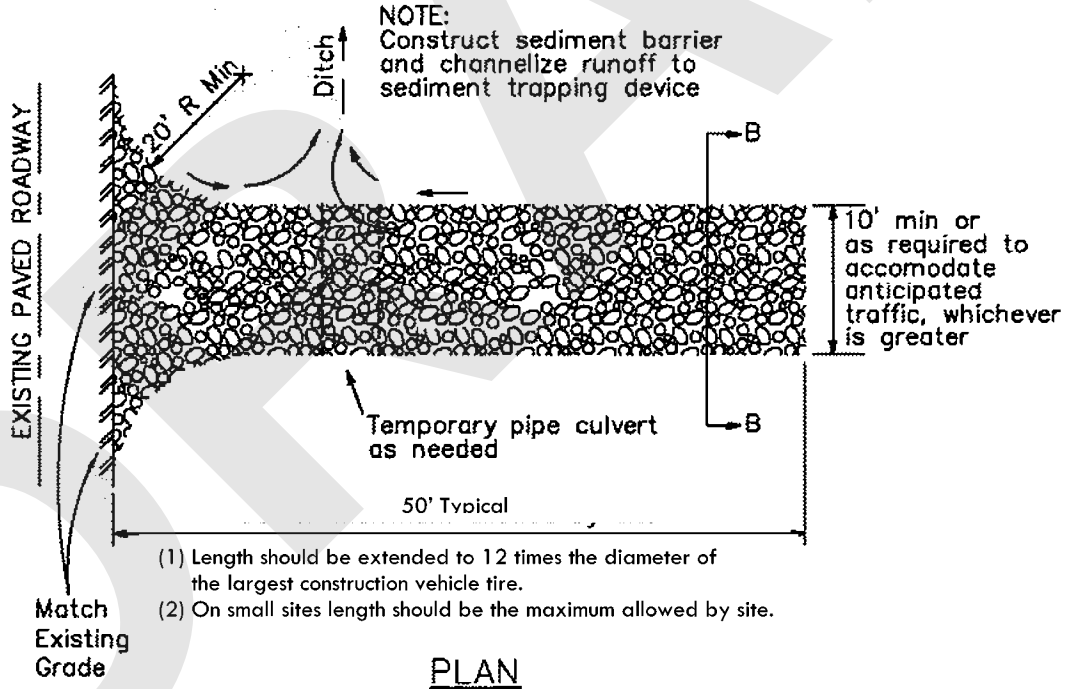
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Stabilized Construction Entrance/Exit TC-1



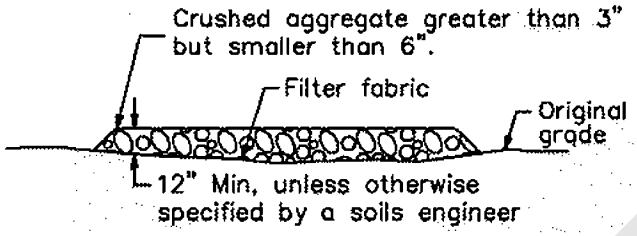
SECTION B–B
NTS



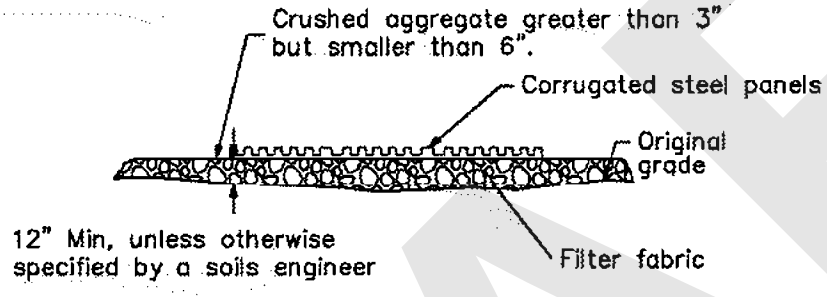
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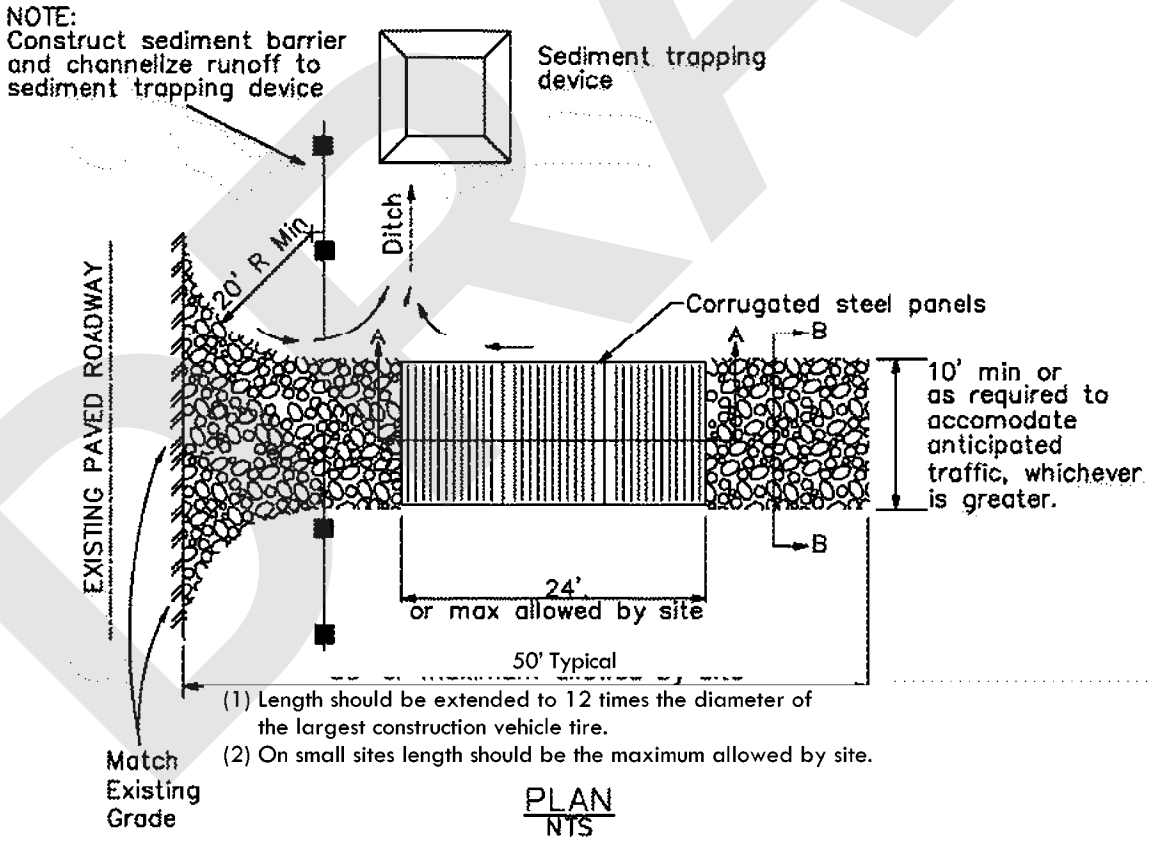
Stabilized Construction Entrance/Exit TC-1



SECTION B–B
NTS



SECTION A–A
NOT TO SCALE



(1) Length should be extended to 12 times the diameter of the largest construction vehicle tire.
(2) On small sites length should be the maximum allowed by site.

PLAN
NTS

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Section 4
Non-Stormwater Management and Material Management BMPs

4.1 Non-Stormwater Management BMPs

The discharge of materials other than stormwater and authorized non-stormwater discharges is prohibited by NPDES regulations as well as other local codes and ordinances. It is recognized that certain authorized non-stormwater discharges may be necessary for the completion of construction projects. Such discharges include, but are not limited to, irrigation of vegetative erosion control measures, and pipe flushing and testing.

Non-stormwater management BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source or eliminating off-site discharge. These practices involve day-to-day operations of the construction site and are usually under the control of the contractor. These BMPs are also referred to as "good housekeeping practices," which involve keeping a clean, orderly construction site.

Non-stormwater management BMPs also include procedures and practices designed to minimize or eliminate the discharge of pollutants from vehicle and equipment cleaning, fueling, and maintenance operations to stormwater drainage systems or to watercourses.

Table 4-1 of this handbook lists the non-stormwater management BMPs. All these BMPs must be implemented depending on the conditions and applicability of deployment described as part of the BMP. The key to implementing these BMPs is to maintain a clean site and keep water, runoff, and run-on away from potential pollutants, including bare soil. In general, conduct construction activities so that: potential pollutants are not discharged directly to drainage systems; generation of potential pollutants is limited; and pollutants that are generated are contained and cleaned up immediately and are therefore not available for later discharge. These BMPs are fundamental to water quality protection and all sites must implement non-stormwater BMPs appropriate for the construction activities being performed.

Table 4-1 Non-Stormwater Management BMPs

BMP#	BMP Name
NS-1	Water Conservation Practices[2]
NS-2	Dewatering Operations[1, 3]
NS-3	Paving and Grinding Operations[1, 3]
NS-4	Temporary Stream Crossing[1, 2]
NS-5	Clear Water Diversion[2]
NS-6	Illicit Connection/Discharge[1, 2]
NS-7	Potable Water/Irrigation[1, 2]
NS-8	Vehicle and Equipment Cleaning[1, 2]
NS-9	Vehicle and Equipment Fueling[1, 2]
NS-10	Vehicle and Equipment Maintenance[1, 2]
NS-11	Pile Driving Operations[1, 2]
NS-12	Concrete Curing[1, 3]
NS-13	Concrete Finishing[1, 3]
NS-14	Material Over Water[1, 2]
NS-15	Demolition Adjacent to Water[1, 2]
NS-16	Temporary Batch Plants[1, 3]

1) BMP fact sheet updated in 2009
2) BMP fact sheet updated in 2011
3) BMP fact sheet updated in 2012

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It is recommended that owners and contractors be vigilant regarding implementation of these BMPs, including making their implementation a condition of continued employment, and part of all prime and subcontract agreements. By doing so, the chance of inadvertent violation by an uncaring individual can be prevented, potentially saving thousands of dollars in fines and project delays. Also, if procedures are not properly implemented and/or if BMPs are compromised then the discharge may be subject to additional sampling and analysis requirements for non-visible pollutants contained in the General Permit. (See Section 2.5.4.2. of this handbook)

4.2 Waste Management and Materials Pollution Control BMPs

Waste management and materials pollution control BMPs, like non-stormwater management BMPs, are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with stormwater. These BMPs also involve day-to-day operations of the construction site, and are under the control of the contractor, and are additional "good housekeeping practices," which involve keeping a clean, orderly construction site. These BMPs are fundamental to water quality protection and all sites must implement waste management and/or materials pollution control non-stormwater BMPs appropriate for the construction activities being performed.

Table 4-2 Waste Management and Materials Pollution Control BMPs

BMP#	BMP Name
WM-1	Material Delivery and Storage[1]
WM-2	Material Use[1]
WM-3	Stockpile Management[1, 2, 3]
WM-4	Spill Prevention and Control[1, 2]
WM-5	Solid Waste Management[1, 2]
WM-6	Hazardous Waste Management[1, 2]
WM-7	Contaminated Soil Management[1, 2]
WM-8	Concrete Waste Management[1, 3]
WM-9	Sanitary/ Septic Waste Management[1]
WM-10	Liquid Waste Management[1]

1) BMP fact sheet updated in 2009
2) BMP fact sheet updated in 2011
3) BMP fact sheet updated in 2012

Waste management consists of implementing procedural and structural BMPs for handling, storing, and disposing of wastes generated by a construction project to prevent the release of waste materials into stormwater runoff or discharges through proper management of the following types of wastes:

- Solid
- Sanitary
- Concrete
- Hazardous
- Equipment-related wastes

Materials pollution control (also called materials handling) consists of implementing procedural and structural BMPs in the handling of, storing, and the using of construction materials. The BMPs are intended to prevent the release of pollutants during stormwater and non-stormwater

discharges. The objective is to prevent or reduce the opportunity for contamination of stormwater runoff from construction materials by covering and/or providing secondary containment of storage areas and/or by taking adequate precautions when handling materials. These controls must be implemented for all applicable activities, material usage, and site conditions. The discharge of construction materials or wastes from a site is prohibited.

Table 4-2 of this handbook lists the waste management and materials pollution control BMPs. It is important to note that these BMPs should be implemented depending on the conditions/applicability of deployment described as part of the BMP.

4.3 Fact Sheet Format

A BMP fact sheet is a short document that presents detailed information about a particular BMP. Typically, each fact sheet contains the information outlined in Figure 4-1 of this handbook. Completed fact sheets for each of the above activities are provided in Section 4.4 of this handbook.

The fact sheets also contain side bar presentations with information on BMP categories, targeted constituents, removal effectiveness, and potential alternatives.

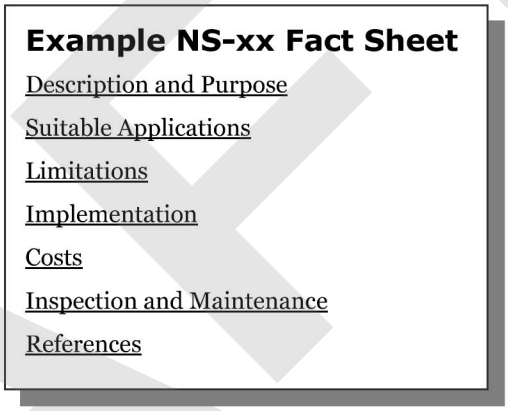


Figure 4-1
Example Fact Sheet

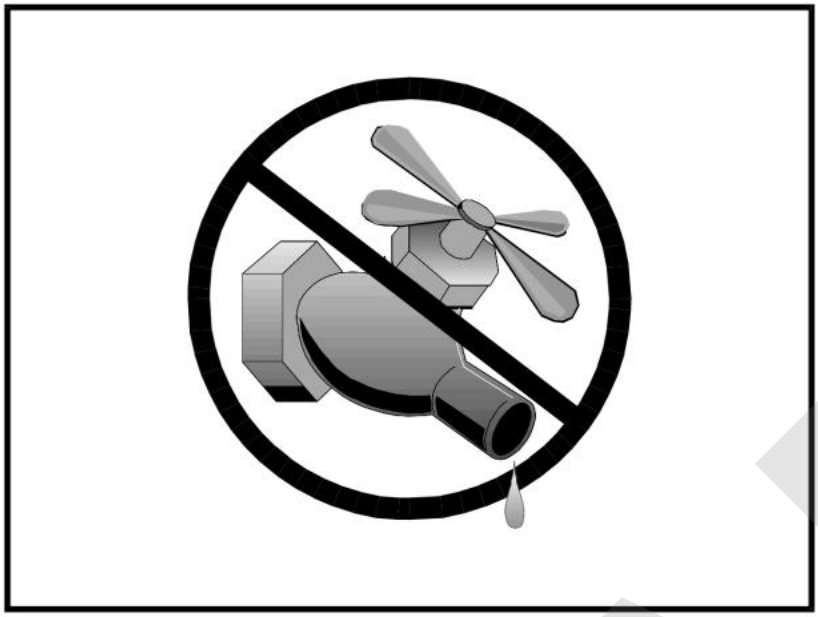
4.4 BMP Fact Sheets

BMP fact sheets for non-stormwater management and waste management and materials pollution control follow. The BMP fact sheets are individually page numbered and are suitable for inclusions in SWPPPs. Copies of the fact sheets can be individually downloaded from the CASQA Online BMP Handbook at http://www.casqa.org.

BMP fact sheets are guidance and intended to provide a range of information about the BMPs. The BMP fact sheets should not be interpreted as General Permit requirements. CASQA recognizes that there may be alternative public domain and/or proprietary practices performing similar function. Alternative products should be evaluated for project-specific implementation and used if determined to be appropriate by the QSD. Fact sheets do not address site-specific implementation application needs and modifications. The QSD should provide site specific implementation requirements in the SWPPP.

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Water Conservation Practices NS-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	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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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.

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- Direct construction water runoff to areas where it can soak into the ground or be collected and used.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

Costs

The cost is small to none compared to the benefits of conserving water.

Inspection and Maintenance

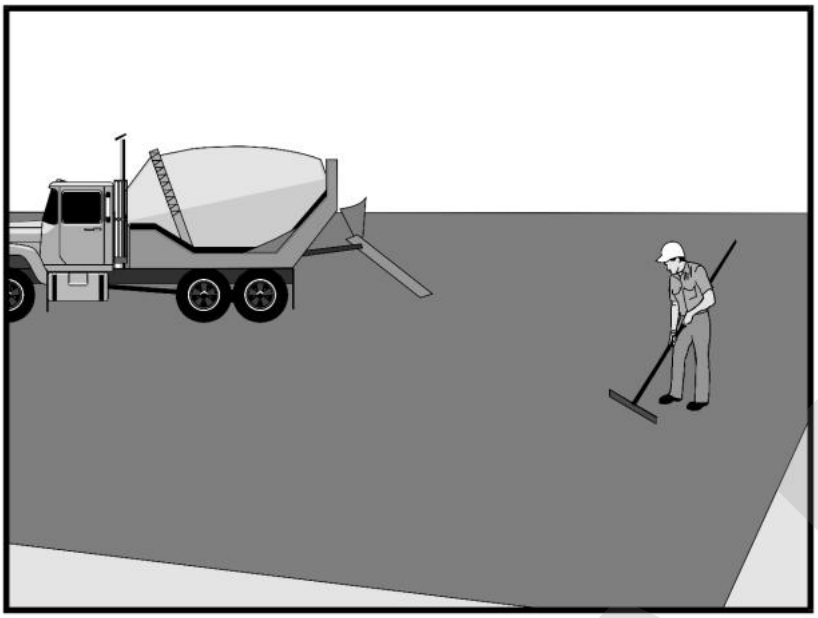
- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occuring.
- 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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Paving and Grinding Operations NS-3



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	☒

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Action Levels (NAL) for pH and turbidity (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 associated with paving and grinding operations, including mortar, concrete, and cement 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, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.

  Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

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Implementation

General

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is forecasted.
- Train employees and sub-contractors in pollution prevention and reduction.
- Store materials away from drainage courses to prevent stormwater runon (see WM-1, Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses. These materials should be stored consistent with WM-3, Stockpile Management.
- Disposal of PCC (Portland cement concrete) and AC (asphalt concrete) waste should be in conformance with WM-8, Concrete Waste Management.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, tack coats, equipment cleaners, or unrelated paving materials:
  - AC grindings, pieces, or chunks used in embankments or shoulder backing should not be allowed to enter any storm drains or watercourses. Install inlet protection and perimeter controls until area is stabilized (i.e. cutting, grinding or other removal activities are complete and loose material has been properly removed and disposed of)or permanent controls are in place. Examples of temporary perimeter controls can be found in EC-9, Earth Dikes and Drainage Swales; SE-1, Silt Fence; SE-5, Fiber Rolls, or SE-13 Compost Socks and Berms
  - Collect and remove all broken asphalt and recycle when practical. Old or spilled asphalt should be recycled or disposed of properly.
- Do not allow saw-cut slurry to enter storm drains or watercourses. Residue from grinding operations should be picked up by a vacuum attachment to the grinding machine, or by sweeping, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM-8, Concrete Waste Management, and WM-10, Liquid Waste Management.
- Pavement removal activities should not be conducted in the rain.
- Collect removed pavement material by mechanical or manual methods. This material may be recycled for use as shoulder backing or base material.

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- If removed pavement material cannot be recycled, transport the material back to an approved storage site.

Asphaltic Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:

  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM-5, Solid Waste Management.

  - Old asphalt should be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a storm drain system. Collect waste materials by dry methods, such as sweeping or shoveling, and return to aggregate base stockpile or dispose of properly. Allow aggregate rinse to settle. Then, either allow rinse water to dry in a temporary pit as described in WM-8, Concrete Waste Management, or pump the water to the sanitary sewer if authorized by the local wastewater authority.

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate should not be allowed to enter any storm drain or water courses. Apply temporary perimeter controls until structure is stabilized (i.e. all sealing operations are complete and cured and loose materials have been properly removed and disposed).

- Inlet protection (SE-10, Storm Drain Inlet Protection) should be used during application of seal coat, tack coat, slurry seal, and fog seal.

- Seal coat, tack coat, slurry seal, or fog seal should not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials and dispose of in accordance with the applicable regulations. See NS-10, Vehicle and Equipment Maintenance, WM-4, Spill Prevention and Control, and WM-10, Liquid Waste Management.

- Substances used to coat asphalt transport trucks and asphalt spreading equipment should not contain soap and should be non-foaming and non-toxic.

- Paving equipment parked onsite should be parked over plastic to prevent soil contamination.

- Clean asphalt coated equipment offsite whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in WM-5, Solid Waste Management. Any cleaning onsite should follow NS-8, Vehicle and Equipment Cleaning.

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Thermoplastic Striping

- Thermoplastic striper and pre-heater equipment shutoff valves should be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the stormwater drainage system, or watercourses.
- Pre-heaters should be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move.
- Do not pre-heat, transfer, or load thermoplastic near drain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. When possible, recycle thermoplastic material.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near drain inlets, the stormwater drainage system, or watercourses.
- Melting tanks should be loaded with care and not filled to beyond six inches from the top to leave room for splashing.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large-scale projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.

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 paving and grinding operations.
- 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.
- Sample stormwater runoff required by the General Permit.
- Keep ample supplies of drip pans or absorbent materials onsite.
- Inspect and maintain machinery regularly to minimize leaks and drips.

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.

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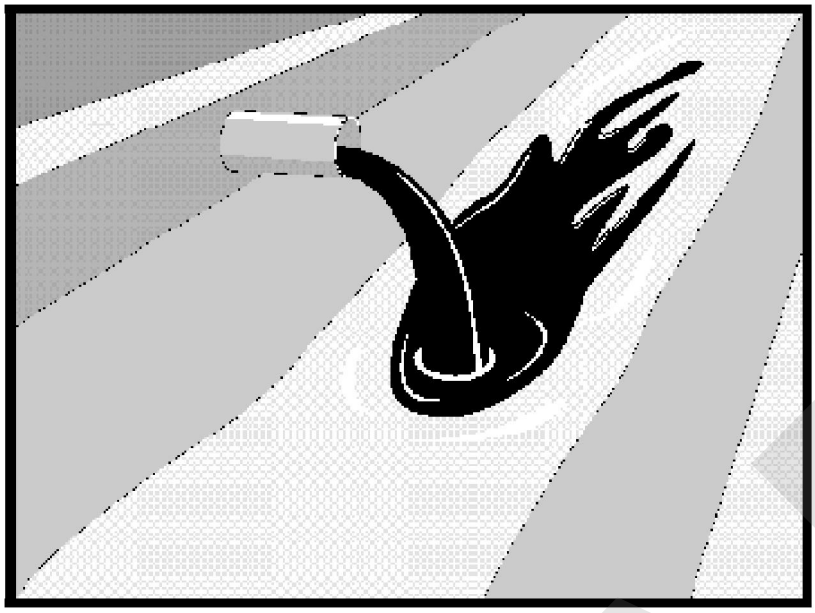
Hot Mix Asphalt-Paving Handbook AC 150/5370-14, Appendix I, U.S. Army Corps of Engineers, July 1991.

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

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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.

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	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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- Inspect site regularly during project execution for evidence 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 BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect 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

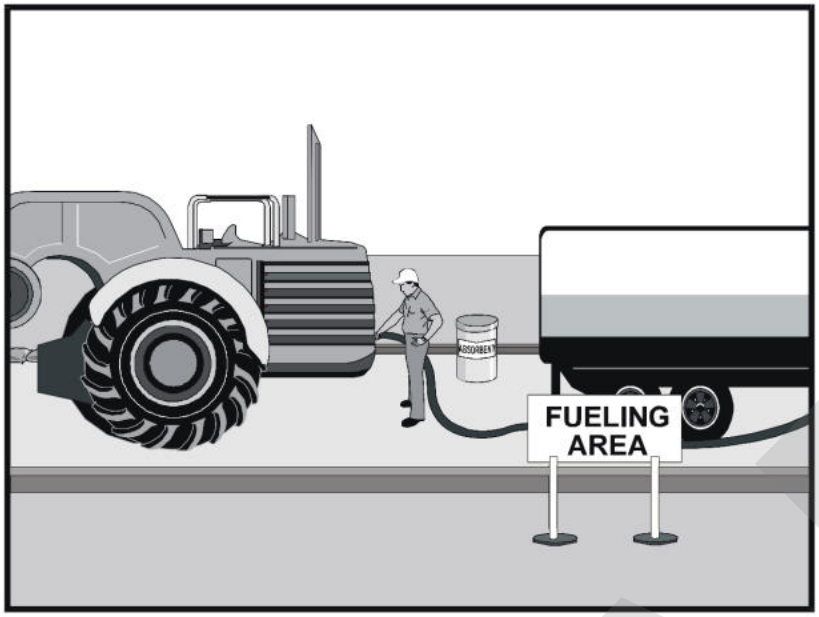
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Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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 Fueling NS-9



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	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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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.

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- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runon and 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 runon, runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately, or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.

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- 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.

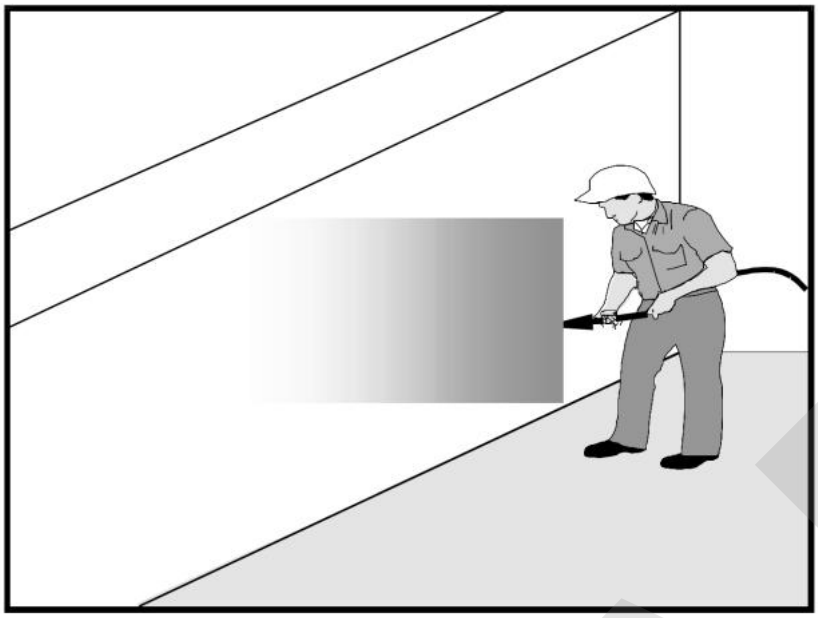
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

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Concrete Curing NS-12



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	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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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 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.

Limitations

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

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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.

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- 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.

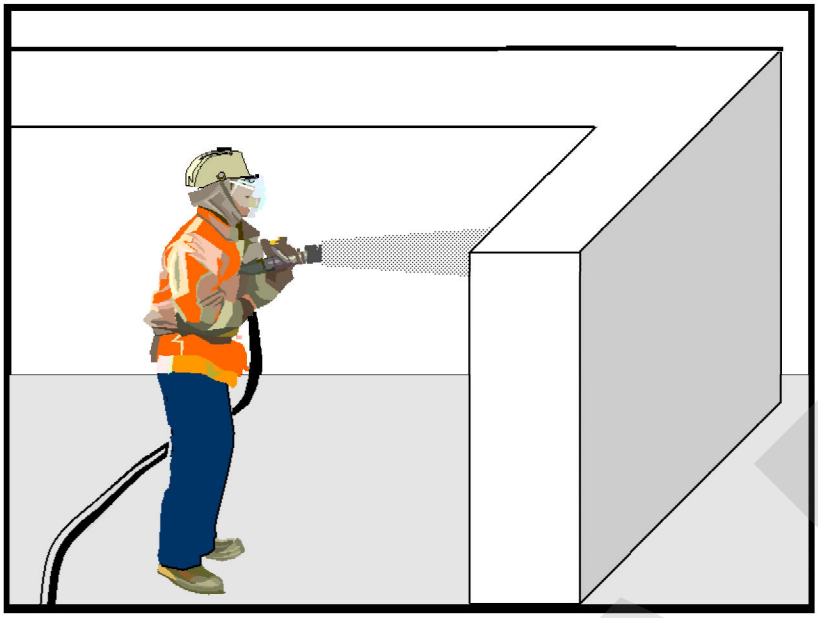
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

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

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Concrete Finishing NS-13



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	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

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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 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.

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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.

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- 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

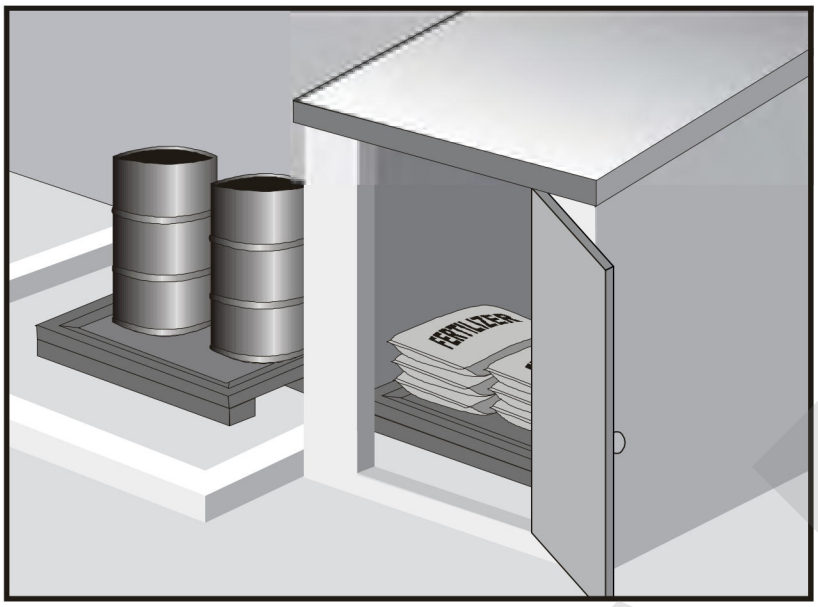
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

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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	☑

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	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area that will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.

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- 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.

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- 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.

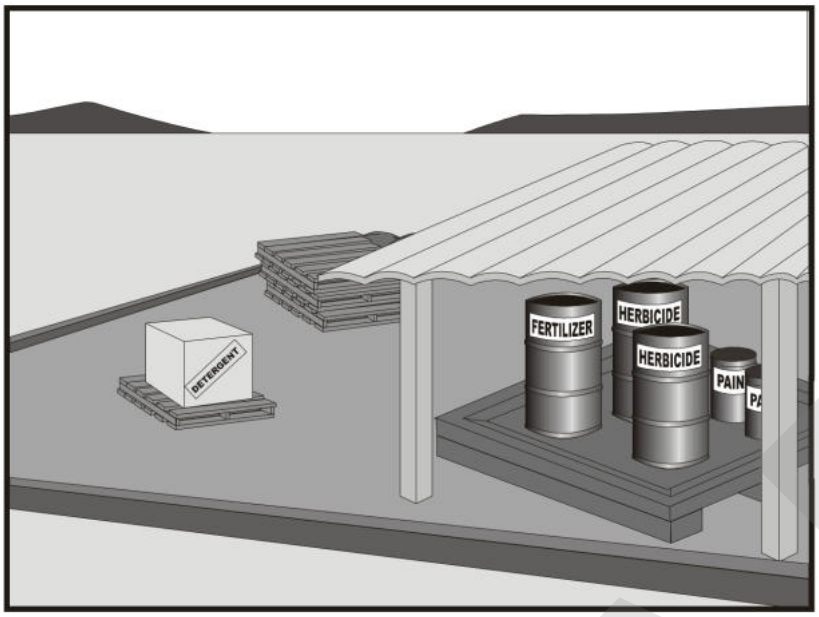
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

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.

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Material Use WM-2



Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
  - Do not treat soil that is water-saturated or frozen.
  - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
  - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
  - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
  - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
  - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
  - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
  - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the

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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.

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- 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.

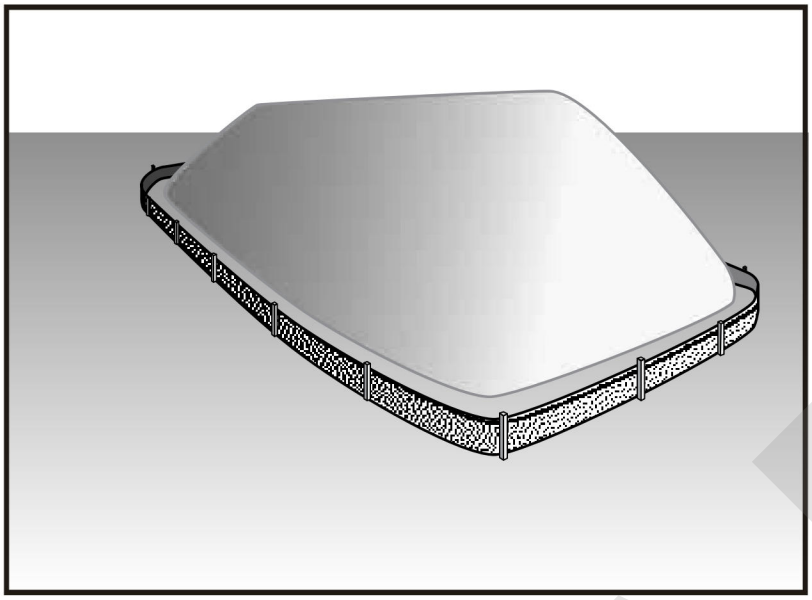
Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP–2005–0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006.Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

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



Treat 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	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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:

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- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- After 14 days of inactivity, a stockpile is non-active and requires further protection described below. All stockpiles are required to be protected as non-active stockpiles immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater run-on using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

Protection of Non-Active Stockpiles

A stockpile is considered non-active if it either is not used for 14 days or if it is scheduled not to be used for 14 days or more. Stockpiles need to be protected immediately if they are not scheduled to be used within 14 days. Non-active stockpiles of the identified materials should be protected as follows:

Soil stockpiles

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- Stockpiles should be covered and protected with a temporary perimeter sediment barrier at all times.

Stockpiles of "cold mix"

- Cold mix stockpiles should be placed on and covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Stockpiles of fly ash, stucco, hydrated lime

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- 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 treated wood

- Treated wood should be covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Protection of Active Stockpiles

A stockpile is active when it is being used or is scheduled to be used within 14 days of the previous use. Active stockpiles of the identified materials should be protected as follows:

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

Costs

For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

Inspection and Maintenance

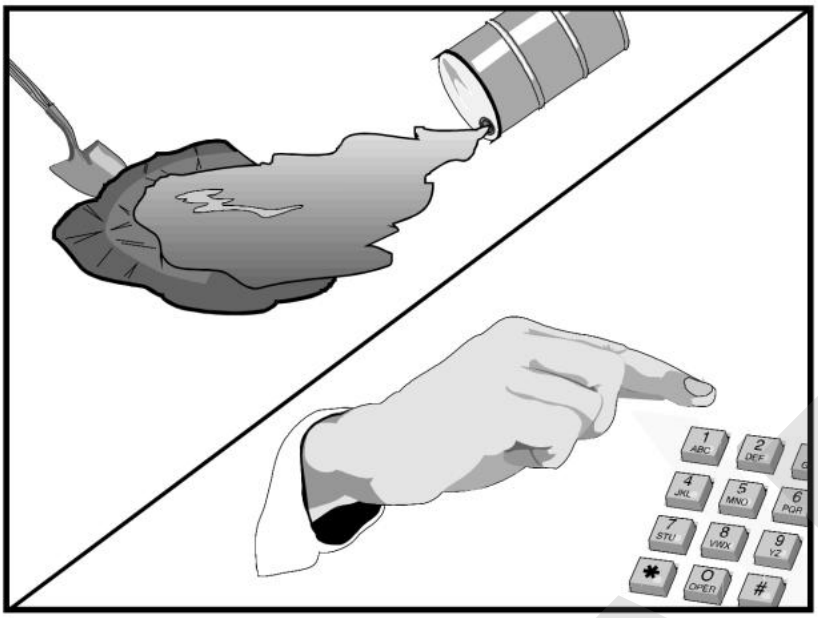
- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

References

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

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Spill Prevention and Control WM-4



Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases, it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

Implementation

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.

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- 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.

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- 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 spill's 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 runon 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 runon of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Costs

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

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- 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

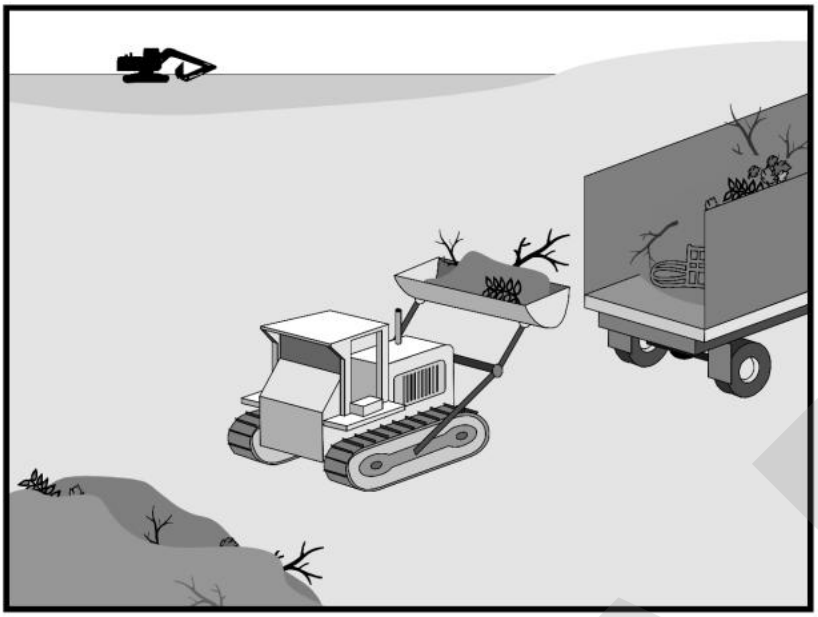
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Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

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Solid Waste Management WM-5



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	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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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

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- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Cover waste containers at the end of each work day and when it is raining.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

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- 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 runon 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.

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- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

References

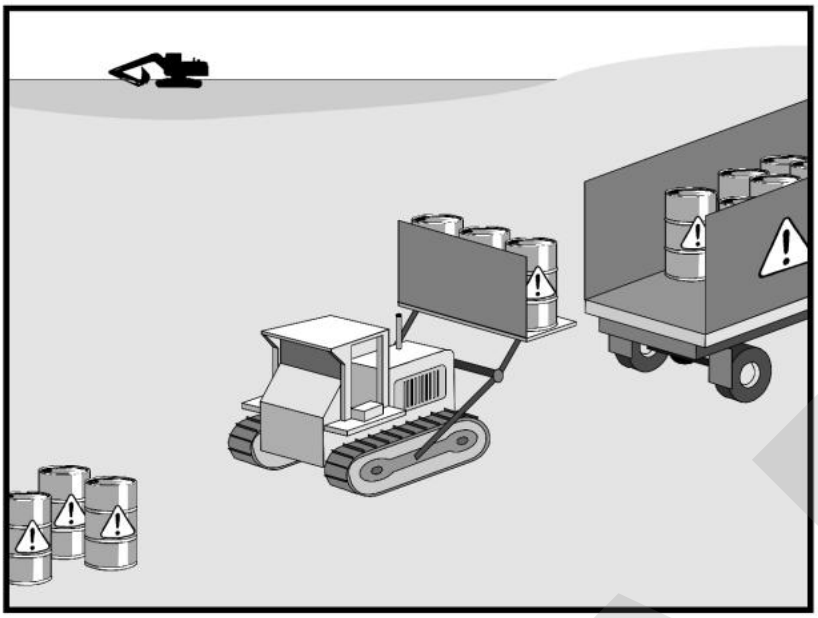
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Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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

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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.

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  - 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.

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- 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.

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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 BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- 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.

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- 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.

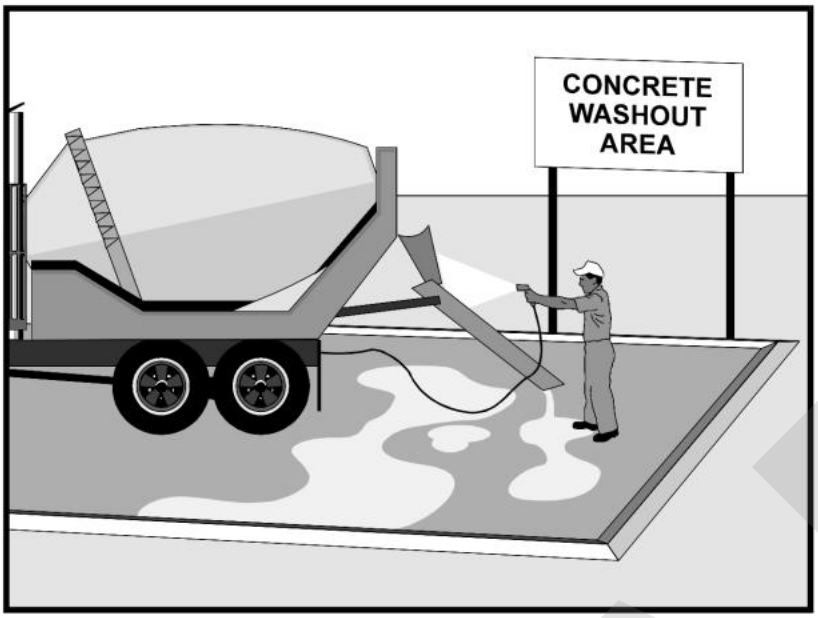
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Concrete Waste Management WM-8



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	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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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 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.
- Concrete trucks and other concrete-coated equipment are washed onsite.

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- 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.
  - Washouts shall be implemented in a manner that prevents leaching to underlying soils. Washout containers must be water tight and washouts on or in the ground must be lined with a suitable impervious liner, typically a plastic type material.
- 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.

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- 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.

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- 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.

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- 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.

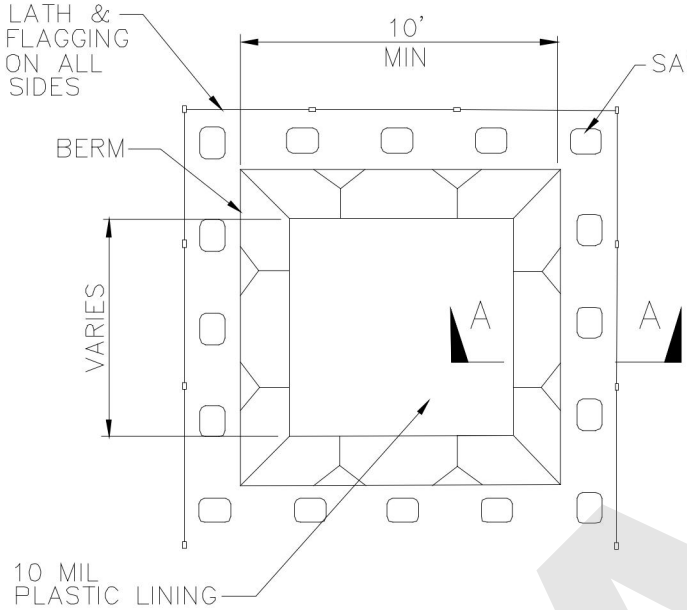
References

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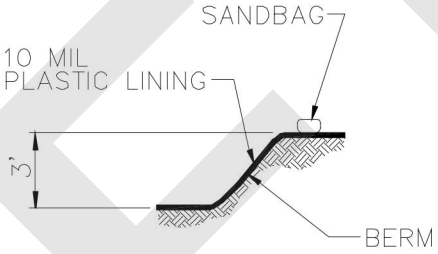
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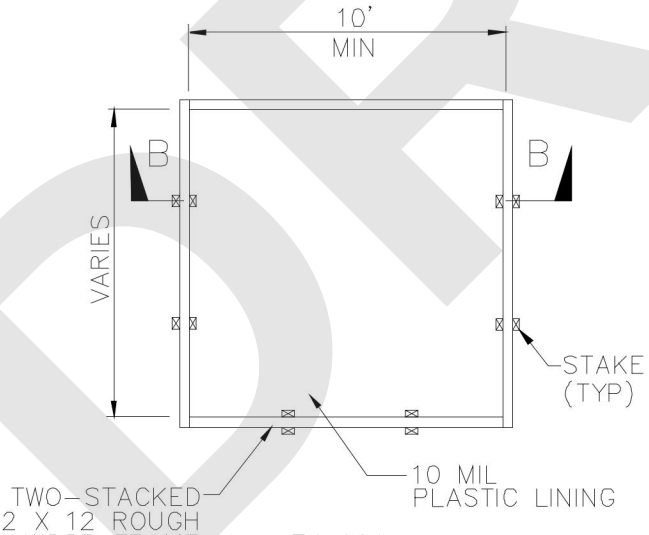
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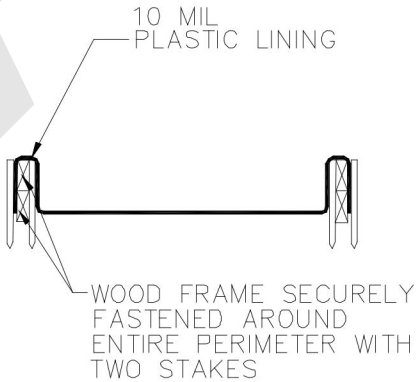
PLAN
NOT TO SCALE
TYPE "BELOW GRADE"



SECTION A–A
NOT TO SCALE



PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"

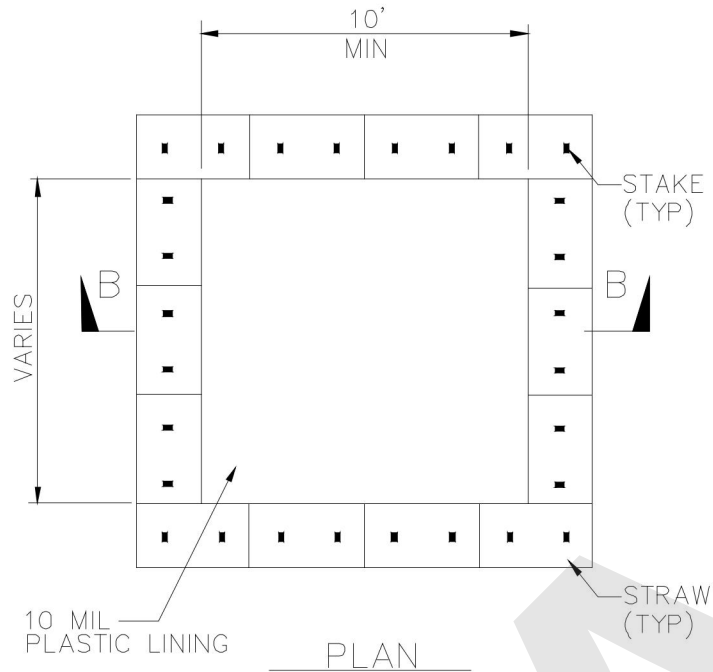


SECTION B–B
NOT TO SCALE

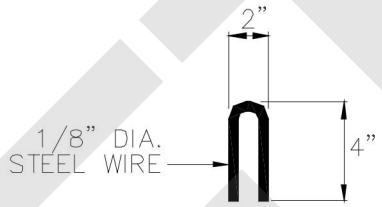
NOTES

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

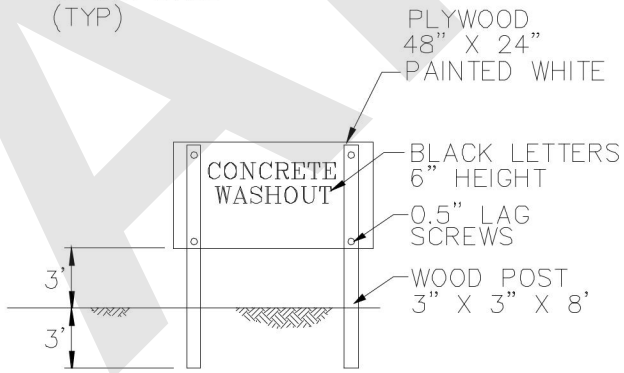
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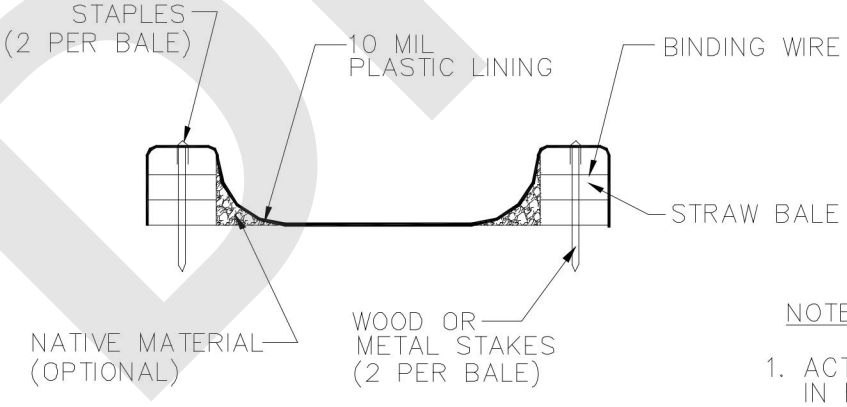
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)



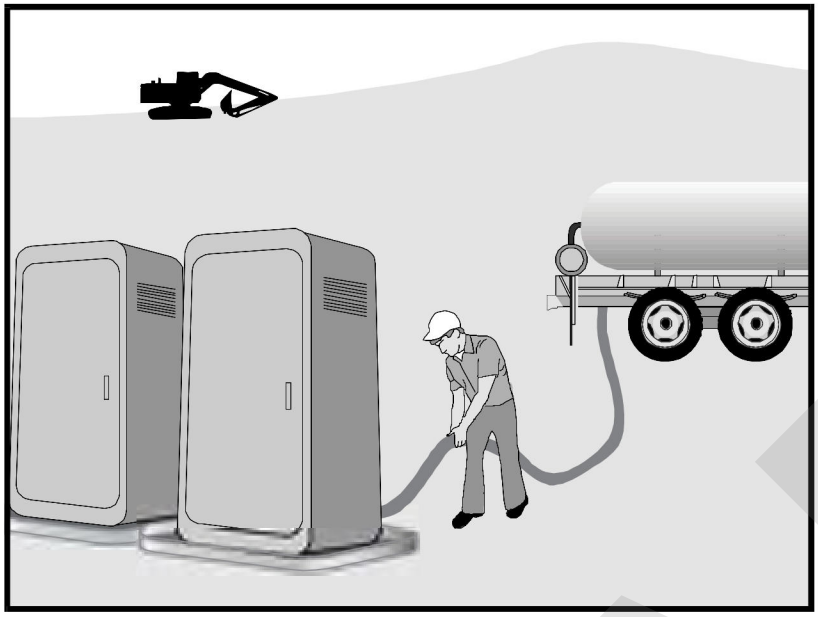
SECTION B–B
NOT TO SCALE

NOTES

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

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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	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑

Potential Alternatives

None

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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.

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Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

References

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

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

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Appendix I BMP Inspection Form

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This Storm Water Pollution Prevention Plan (SWPPP) is being submitted in draft form. At this stage of the Project, certain required elements have not yet been finalized and are therefore not included in the appendices.

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Appendix J Training Reporting Form

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Trained Contractor Personnel Log

Project Name: Skycharger Zero-Emission Truck Charging Facility
WDID #: _____

Stormwater Management Topic: (check as appropriate)

☐ Erosion Control
☐ Sediment Control
☐ Wind Erosion Control
☐ Tracking Control
☐ Non-Stormwater Management
☐ Waste Management and Materials Pollution Control
☐ 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).

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Appendix K Responsible Parties

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This Storm Water Pollution Prevention Plan (SWPPP) is being submitted in draft form. At this stage of the Project, certain required elements have not yet been finalized and are therefore not included in the appendices.

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Appendix L Contractors and Subcontractors

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Appendix L - Contractors and Subcontractors

Project Name: Terminal 2 West Hydrant Fuel

Owner: System SAN Fuel Company, LLC

SUBCONTRACTOR NAME	AREA OF RESPONSIBILITY	CONTACT NAME	CONTACT NUMBER

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Appendix M Construction General Permit

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ATTACHMENT D

TRADITIONAL CONSTRUCTION RISK LEVEL REQUIREMENTS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORMWATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES
(GENERAL PERMIT)

I. GENERAL REQUIREMENTS

Risk Level 1, 2, and 3 dischargers shall implement the following minimum best management practices (BMPs) to reduce or prevent pollutants in construction stormwater discharges, monitoring requirements, and reporting requirements. If a requirement in this attachment does not specify a specific Risk Level, then the requirement applies to Risk Level 1, 2, and 3 dischargers.

II. MINIMUM BEST MANAGEMENT PRACTICES

II.A. Good Site Management "Housekeeping"

II.A.1. Dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged or exposed to stormwater. At a minimum, dischargers shall implement the following good housekeeping measures:

a. Identify and protect the products used and/or expected to be used and the end products that are produced and/or expected to be produced from exposure to stormwater. Products do not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (e.g., poles, equipment pads, cabinets, conductors, insulators, bricks, roofing, and siding);

b. Apply BMPs to erodible stockpiled construction materials (e.g., soil, spoils, fly-ash, stucco, hydrated lime) to prevent erosion and pollutant transport;

c. Store chemicals in watertight containers with secondary containment to prevent any spillage or leakage or store in a completely enclosed storage area;

d. Minimize exposure of construction materials to precipitation. Construction materials do not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (e.g., poles, equipment pads, cabinets, conductors, insulators, bricks);

e. Implement BMPs to control the off-site tracking of sediment and loose construction and landscape materials; and

f. Implement BMPs to control the discharge of plastic materials and limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Dischargers shall consider the use of plastic materials resistant to solar degradation where plastic materials are deemed necessary.

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II.A.2. Dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, masonry wash waters, and other wash waters. Wash waters shall be captured and treated prior to discharge, or disposed of at a permitted facility that can accept that waste, to mitigate impacts to water quality;

b. Provide containment (e.g., secondary containment) of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the stormwater drainage system or receiving water;

c. Clean or replace sanitation facilities and inspect them regularly for leaks and spills;

d. Keep debris or trash in waste containers if it is subject to transport from the site by wind or runoff;

e. Cover waste disposal containers at the end of every business day and during a precipitation event;

f. Prevent discharges from waste disposal containers to the stormwater drainage system or receiving water (e.g., containers with solid bottoms and regular maintenance);

g. Contain and securely protect stockpiled waste material from wind and precipitation unless actively being used; and

h. Secure and contain concrete washout areas and other washout areas that may contain additional pollutants to minimize discharge into the underlying soil and onto surrounding areas. Washout areas shall be covered prior to and during a precipitation event.

II.A.3. Dischargers shall implement good housekeeping for vehicle/equipment storage and maintenance, which shall consist of the following:

a. Contain fuel, grease, and oil to prevent them from leaking into ground, storm drains, or surface waters;

b. Place all equipment or vehicles, which are to be fueled, maintained, and/or stored in a designated area with BMPs installed; and

c. Clean leaks immediately and dispose of leaked materials properly in accordance with the law.

II.A.4. Dischargers shall implement good housekeeping for landscape materials, which shall consist of the following:

a. Contain and protect stockpiled materials such as mulches and topsoil, or other erodible landscape materials, from wind and precipitation unless being actively used;

b. Contain packaged landscape materials (e.g., fertilizers) when they are not being actively used;

c. Discontinue the application of any erodible landscape material at least 2 days before a forecasted precipitation event as defined in Attachment B or during periods of precipitation; and

d. Apply erodible landscape material at quantities and rates in accordance with manufacturer recommendations or based on written specifications by knowledgeable and experienced field personnel;

II.A.5. Dischargers shall implement good housekeeping measures on the construction site to control the aerial deposition of site materials and from site operations. Such particulates can include, but are not limited to, metals, nutrients, organics, sediment, other particulates, and trash.

II.A.6. Dischargers shall document all housekeeping BMPs in the SWPPP that correspond to the nature and phase of the construction activities. Construction phases at traditional land development projects include demolition and pre-development site preparation phase, grading and land development phase, streets and utilities phase, vertical construction phase, and final landscaping and site stabilization phase.

II.B. Non-Stormwater Management

II.B.1. Dischargers shall implement the following measures to control all non-stormwater discharges during construction:

a. Wash vehicles in such a manner as to prevent non-stormwater discharges to surface waters or municipal separate sewer system drainage systems;

b. Clean streets in such a manner as to prevent unauthorized non-stormwater discharges from reaching surface water or municipal separate sewer system drainage systems; and

c. Eliminate any non-stormwater discharges not authorized in Section IV.A of this General Permit's Order.

II.C. Preserve Existing Topsoil

II.C.1. Dischargers shall preserve existing topsoil, unless infeasible, through the following practices:

a. Stockpiling existing topsoil, or transferring topsoil to other locations, to deploy and reestablish vegetation prior to termination of coverage; and

b. Stabilizing disturbed topsoil during construction.

Preserving existing topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.[1]

1 Examples may include the removal of topsoil containing invasive seedbanks, lack of space to stockpile topsoil, and sites that are designed to be highly impervious after construction with little to no vegetation intended to remain.

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II.D. Erosion Control

II.D.1. Dischargers shall implement the following practices to eliminate or minimize site erosion. Erosion control BMPs (except for sprayed products) shall be available on-site or at a nearby location (e.g., common lay-down yard), year-round with trained persons able to deploy the product under the direction of the Qualified SWPPP Practitioner:

a. Implement effective wind erosion control;

b. Preserve existing vegetation;

c. Minimize the amount of soil exposed during construction activity;

d. Minimize the disturbance of steep slopes;

e. Schedule earthwork to minimize the amount of disturbed area when feasible;

f. Immediately initiate stabilization for disturbed areas whenever earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days;[2]

g. Minimize soil compaction in areas other than where the intended function of a specific area dictates that it be compacted;

h. Reestablish vegetation or non-vegetative erosion controls as soon as practicable;

i. If feasible, divert up gradient run-on water from contacting areas of exposed soils disturbed by construction activities or convey run-on through the site in a manner that prevents erosion from areas of construction and does not compromise the effectiveness of erosion, sediment, and perimeter controls;

j. Run-on water flowing onto a site from off-site areas may be separated from a site's stormwater discharge to eliminate commingled contribution. Run-on diversion shall occur prior to entering an area affected by construction activity. Run-on flow diversion shall be conveyed through or around the construction activity in plastic pipe or an engineered conveyance channel in a manner that will not cause erosion due to flow diversion. Run-on combined with a site's stormwater discharge is considered a stormwater discharge.

k. Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the

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2 In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures shall be employed as specified by the Regional Water Board. Stabilization shall be completed within a period of time determined by the Regional Water Board. In limited circumstances stabilization may not be required if the intended function of a specific area of the site necessitates that it remains disturbed.

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discharger shall consider the use of plastic materials resistant to solar degradation;

l. Control stormwater and non-stormwater discharges to minimize downstream channel and bank erosion; and

m. Control peak flowrates and total volume of stormwater and authorized non-stormwater discharges to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

II.D.2. Dischargers that stabilize soil using bonded-fiber matrices, hydromulches, spray tackifiers, or other land-applied products shall:

a. Apply the product according to the manufacturer's instructions and guidance; and

b. Apply the product according to the manufacturer's guidance to allow for ample cure time and to prevent treatment chemicals from being transported by runoff.

II.E. Sediment Controls

II.E.1. Dischargers shall implement the following site sediment controls:

a. Establish and maintain effective perimeter controls;

b. Stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site; and

c. Design, install, and maintain effective sediment controls to minimize the discharge of pollutants utilizing site-specific BMPs.

At a minimum, design sediment basins and impoundments according to the method provided in the California Stormwater Quality Association Construction BMP Handbook[3] and utilize outlet structures that withdraw water from the surface. Dischargers utilizing sediment basins shall complete installation prior to other land disturbance activities.

II.F. Additional Risk Level 2 and 3 Requirements:

II.F.1. Risk Level 2 and 3 dischargers shall implement the following additional erosion and sediment control BMPs for areas under active[4] construction:

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3 California Stormwater Quality Association (CASQA), Construction BMP Handbook (January 2015), <https://www.casqa.org/sites/default/files/casqa-handbook-construction/master_hanbook_file_2015_sec.pdf> [as of May 20, 2021] (CASQA Construction BMP Handbook)

4 Active areas of construction are areas undergoing land surface disturbance and associated site areas. This includes construction activity during the preliminary phase, mass grading phase, streets and utilities phase, and the vertical construction phase.

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a. Design and construct cut and fill slopes in a manner to ensure slope stability and to minimize erosion including, but not limited to, these practices:

   i. Reduce continuous slope length using terracing and diversions;

   ii. Reduce slope steepness; and

   iii. Roughen slope surfaces with large cobble or track walking.

b. Install linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes according to sheet flow lengths as shown in Table 1 until the slope has reached Notice of Termination conditions for erosion protection. When infeasible to comply with Table 1 due to site-specific geology or topography, the QSD shall include in the SWPPP a justification for the use of an alternative method to protect slopes from erosion and sediment loss.

Table 1 - Critical Slope and Sheet Flow Length Combinations for Linear Sediment Reduction Barrier

Slope Ratio (Vertical to Horizontal)	Sheet flow length not to exceed
≤ 1:20	Per QSD's specification.
> 1:20 to ≤ 1:4	35 feet
> 1:4 to ≤ 1:3	20 feet
> 1:3 to ≤ 1:2	15 feet
> 1:2	10 feet

II.F.2. Limit construction activity traffic to and from the project to entrances and exits that employ effective controls to prevent off-site tracking of sediment.

II.F.3. Maintain and protect all storm drain inlets, perimeter controls, and BMPs at entrances and exits (e.g., tire wash off locations).

II.F.4. Remove any excess sediment or other construction activity-related materials that are deposited on the impervious roads by vacuuming or sweeping prior to any precipitation event.

II.F.5. Implement additional site-specific sediment controls upon written request by the Regional Water Boards when the implementation of the other requirements in this Section are determined to inadequately protect the site's receiving water(s).

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II.G. Surface Water Buffer[5]

II.G.1. Dischargers shall provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. is located within 50 feet of the site's earth disturbances, unless infeasible.

II.G.2. Dischargers shall comply with one of the following alternatives for any discharges to waters of the U.S. located within 50 feet of a site's earth disturbances:

a. Provide and maintain a 50-foot undisturbed natural buffer from the edge of the disturbed area to the top of bank;

b. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. The equivalent sediment load may be calculated using RUSLE2 or another method approved by the Regional Water Board; or

c. Implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer when infeasible to provide and maintain an undisturbed natural buffer of any size. The equivalent sediment load may be calculated using RUSLE2 or another method approved by the Regional Water Board.

II.H. Pesticide Application

Dischargers shall only apply pesticides that have been authorized for use through California Department of Pesticide Regulation. The application of pesticides shall follow manufacturer's guidance.

II.I. Demolition of Existing Structure

Dischargers shall prevent exposing demolition materials to precipitation. Demolition materials should be covered with an impermeable barrier such as, but not limited to, plastic sheeting prior to precipitation to prevent known contaminants from being mobilized. Dischargers unable to cover demolished material that were not previously investigated or found to be absent of applicable pollutants in reportable quantities shall sample for any non-visible pollutants that may be in stormwater

5 The surface water buffer requirements apply to work above the top-of-bank or high-water level of waters of the United States. Work within a channel or streambed (water body-dependent construction), Clean Water Act § 404 projects with a § 401 certification, and projects where no natural surface buffer exists (e.g., concrete channelization) are exempt from the requirements. All types of in-channel work may be regulated under § 401 (Clean Water Act - Regional Boards), § 404 (Clean Water Act - Army Corps of Engineers), or §1602 (California Fish and Game Code).

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discharges such as, but not limited to, asbestos, leaded paint, or Poly Chlorinated Biphenyls (PCBs)[6].

II.J. Maintenance and Repair

II.J.1. Dischargers shall begin maintaining, repairing, and/or implementing design changes (reviewing alternatives that have not been used yet) to BMPs within 72 hours of identification of failures or other shortcomings and complete the changes as soon as possible, prior to the next forecasted precipitation event.

II.J.2. Dischargers shall have a Qualified SWPPP Practitioner (QSP) verify all BMP maintenance and repairs were appropriately implemented during the next visual inspection following completion. The QSP may delegate BMP maintenance and repair verification to an appropriately trained delegate.

III. MONITORING REQUIREMENTS

III.A. General Requirements

The monitoring requirements of this Section are issued pursuant to Water Code § 13383 and specifies monitoring requirements for dischargers subject to this Order.

All dischargers shall implement the Construction Site Monitoring Program in compliance with this Section at the time of the commencement of construction activity and shall continue implementation until the project is complete and the project site is stabilized as defined in Section III.H in the Order.

III.B. Monitoring Exceptions

III.B.1. Dischargers shall conduct visual inspections and collect samples to meet the requirements of this Attachment. Dischargers are not required to physically conduct visual inspections or collect samples under the following conditions:

a. During dangerous weather conditions such as electrical storms, flooding, and high winds above 40 miles per hour;

b. Outside of scheduled site operating hours; or

c. When the site is not accessible to personnel.

III.B.2. For inactive projects, dischargers may reduce the visual inspection frequency and suspend sampling per Section III.G of the Order. Dischargers shall provide an explanation with supporting information for all missed visual inspections or sampling required by this Attachment, to be included in the Annual Report.

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6 PCBs were used between January 1, 1950 and January 1, 1980 and should be considered to be potentially present in structures built during that timeframe. “Structure”, in this instance, shall have been constructed with floor space (such as a building).

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III.C. Visual Inspection Requirements

III.C.1. Dischargers shall perform visual inspections, based on their Risk Level, in accordance with Table 2 below. The purpose of visual inspections is, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Except as specified in Section III.C.3 below, inspectors shall be the Qualified SWPPP Developer, Qualified SWPPP Practitioner, or be trained by the Qualified SWPPP Practitioner.

Table 2 – Visual Inspection Schedule[7]

Risk Level	Weekly	Pre-Qualifying Precipitation Event	During Qualifying Precipitation Event	Post-Qualifying Precipitation Event
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X

III.C.2. Dischargers shall conduct weekly visual inspections to ensure that BMPs are properly installed and maintained. A pre-, during, or post-qualifying precipitation event inspection also satisfies the weekly visual inspection requirement.

III.C.3. Dischargers shall have a QSP conduct a pre-Qualifying Precipitation Event inspection within 72 hours prior to any weather pattern that is forecasted to have a 50 percent or greater chance of 0.5 inches or more in a 24-hour period. Precipitation forecast information shall be obtained from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at https://www.weather.gov/) and shall be included as part of the inspection checklist weather information. If extended forecast precipitation data (greater than three days) is available from the National Weather Service, the pre-precipitation event inspection may be done up to 120 hours in advance. The pre-Qualifying Precipitation Event inspection shall include an inspection of the following:

a. All stormwater drainage areas to identify leaks, spills, or uncontrolled pollutant sources and when necessary, implement appropriate corrective actions to control pollutant sources.

b. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP, and when necessary, implement appropriate corrective actions to control pollutant sources.

c. All stormwater storage and containment areas to detect leaks and check for available capacity to prevent overflow.

III.C.4. Dischargers shall conduct visual inspections at least once every 24-hour period during Qualifying Precipitation Events. Qualifying Precipitation Events are

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7 This table is limited to routine weekly inspections and Qualifying Precipitation Event related inspections. Other visual inspections may be required under this Permit and are described in the applicable sections.

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extended for each subsequent 24-hour period forecast to have at least 0.25 inches of precipitation.

III.C.5. Dischargers shall conduct post-Qualifying Precipitation Event visual inspections within 96 hours after each Qualifying Precipitation Event if 0.5 inches or more precipitation is measured during the duration of the Qualifying Precipitation Event using the onsite rain gauge. The inspection is to:

a. Identify if BMPs were adequately designed, implemented, and effective;

b. Identify BMPs that require repair or replacement due to damage; and

c. Identify additional BMPs that need to be implemented and revise the SWPPP accordingly.

III.C.6. Dischargers shall conduct visual inspections during scheduled site operating hours.

III.C.7. For each required inspection, dischargers shall develop and complete an inspection checklist that, at a minimum includes:

a. Inspection type (weekly, pre-precipitation, daily precipitation, or post-precipitation event);

b. Inspection date and time the inspection was conducted;

c. Weather information, including the presence or absence of precipitation, an estimate of the beginning of the Qualifying Precipitation Event, duration of the event, date of the end of the Qualifying Precipitation Event, and the amount of precipitation in inches;

d. Site information, including stage of construction, activities completed since last inspection, and approximate area of the site exposed;

e. A description of any BMPs evaluated and any deficiencies noted, including those that may have resulted in the release of non-visible pollutants;

f. A list of BMPs inspected, including erosion controls, sediment controls, chemical and waste controls, and non-stormwater controls;

g. Report of the presence of any floating and suspended materials, odors, discolorations, visible sheens, and any sources of pollutants in discharges and contained stormwater;

h. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;

i. Photographs of areas of concern and the QSP's description of the problem, if any; and

j. Inspector's name, title, and certification, if any.

III.D. Water Quality Monitoring Requirements

Dischargers shall collect samples of discharges, based on their Risk Level in accordance with Table 3 and the requirements below, to monitor water quality and

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assess compliance with the requirements of this General Permit. Samplers shall be the QSD, QSP, or be trained by the QSP.

Table 3 – Sample Collection Schedule

Risk Level	Stormwater Discharge Sample Collection (as applicable)	Receiving Water Sample Collection (as applicable)	Non-Visible Sample Collection (as applicable)
1	Not Applicable	Not Applicable	X
2	X	Not Applicable	X
3	X	X (Post-exceedance)	X

III.D.1. Risk Level 2 and 3 Stormwater Discharge Monitoring Requirements

III.D.1.a. Risk Level 2 and 3 dischargers shall collect stormwater grab samples, from all discharge locations incorporating runoff from project construction sites[8], during discharge and within site operating hours. The grab samples shall be representative of the discharge flow and characteristics.

III.D.1.b. Risk Level 2 and 3 dischargers shall obtain one sample from each discharge location per 24-hour period of each Qualifying Precipitation Event, during active discharge.

III.D.1.c. Risk Level 2 and 3 dischargers shall collect samples of stored or contained stormwater during discharge from the impoundment, in accordance with Attachment J.

III.D.1.d. Risk Level 2 and 3 dischargers shall analyze all samples for:

i. pH and turbidity (refer to Order, Section IV.C.3.c and d); and

ii. Any additional parameter required by the Regional Water Board.

III.D.1.e. Risk Level 2 and 3 dischargers may sample run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of numeric action levels and/or numeric effluent limitations.

III.D.2. Risk Level 3 Receiving Water Monitoring Requirements

III.D.2.a. Risk Level 3 dischargers who discharge directly into receiving waters are also required to monitor that receiving water if sampling results from the discharge monitoring location meets either of the following conditions:

i. pH value falls outside of the range of 6.0 and 9.0 pH units; or

ii. Turbidity exceeds 500 NTU.

8 The Glossary definition of ‘site’ applies here, i.e., *The area where the construction activity is physically located or conducted, including staging, storage, and access areas.*

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III.D.2.b. Receiving water monitoring does not apply if run-on from a forest fire or any other natural disaster caused the stormwater results to fall outside the pH range or exceed the turbidity value.

III.D.2.c. Risk Level 3 dischargers required to conduct receiving water monitoring shall collect samples as follows:

i. Collect, at minimum, one upstream receiving water sample from an accessible and safe location that is:

1. Representative of the receiving water;
2. As close as possible to the discharge location; and
3. Upstream from the discharge location.

ii. Collect, at minimum, one downstream receiving water sample from an accessible and safe location that is:

1. Representative of the receiving water;
2. As close as possible to the discharge location; and
3. Downstream from the discharge location.

III.D.2.d. Risk Level 3 dischargers shall analyze the samples for the parameter that triggered this monitoring (either pH or turbidity, or both).

III.D.2.e. Risk Level 3 dischargers shall collect the samples once every 24-hour period of the Qualifying Precipitation Event.

III.D.2.f. Risk Level 3 dischargers shall specify the specific locations where samples were collected, date and time of sample collection, as well as constituents analyzed.

III.D.2.g. The Regional Water Board delegate may require, in writing, that the Risk Level 3 discharger continue to sample the receiving water for the parameter that required this monitoring (pH and/or turbidity) after the Qualifying Precipitation Event ends.

III.D.3. Non-Visible Pollutant Monitoring Requirements

III.D.3.a. Dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants when there is:

i. Evidence of pollutant releases that are not visually detectable in stormwater discharges; and

ii. Releases of substances which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

III.D.3.b. Dischargers are required to conduct sampling and analysis for non-visible pollutants identified in the SWPPP or otherwise known to be on site, only when the pollutants may be discharged due to failure to implement BMPs, a container spill or leak, or a BMP breach, failure, or malfunction.

DRAFT

III.D.3.c. Dischargers shall collect at least one sample, within 8 hours, from each discharge location hydraulically down-gradient from the observed triggering event or condition.

III.D.3.d. Dischargers shall continue to collect at least one sample per applicable discharge location for each 24-hour period that there is discharge, until the necessary corrective actions are completed to control further discharge of the pollutant.

III.D.3.e. Dischargers are not required to sample if one of the conditions described in Section III.D.3.b above (e.g., breach or spill) occurs and, prior to discharge, the material containing the pollutant is fully remediated or removed; and BMPs to control the pollutant are implemented, maintained, or replaced as necessary.

III.D.3.f. Dischargers shall analyze samples in the field or submit them to a laboratory as specified in Section III.F of this Attachment for analysis of all non-visible pollutants suspected to be present in the discharge, including applicable TMDL-specific pollutants listed in Table H-2 in Attachment H.

III.E. Sample Collection and Handling Instructions

III.E.1. Dischargers shall:

a. Identify applicable parameters that require laboratory analysis for each stormwater discharge location (pH and turbidity are typically analyzed with field meters).

b. Request the laboratory provide the appropriate number of sample containers, types of containers, sample container labels, blank Chain of Custody forms, and sample preservation instructions.

c. Use the appropriate sample shipping method to the laboratory. The laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory to meet all method hold times). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

d. Use only the sample containers provided/specified by the laboratory to collect and store samples. Use of any other type of containers could cause sample contamination.

e. Prevent sample contamination by not touching or putting anything into the sample containers before collecting stormwater samples.

f. Not overfill sample containers. Overfilling can change the analytical results.

g. Secure each sample container cap without stripping the cap threads.

h. Label each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.

DRAFT

i. Carefully pack the sample container into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment; frozen ice packs or ice is placed into the shipping container to keep the sample close to 4° C (39° F) until arriving at the laboratory (do not freeze samples).

j. Complete a Chain of Custody form with each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, the analysis that is required for each sample container, and both the signatures of the persons relinquishing and receiving the sample containers.

III.E.2. The Discharger shall designate and train personnel for the collection, maintenance, and shipment of samples in accordance with the above sample protocols and laboratory-specific practices.

III.E.3. Dischargers shall perform all sampling and preservation protocols in accordance with the 40 Code of Federal Regulations Part 136 and the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association).[9]

III.E.4. Dischargers may refer to the Surface Water Ambient Monitoring Program's (SWAMP) Quality Assurance Program Plan (QAPrP) for more information on sampling collection and analysis.[10]

III.F. Analytical Methods Requirements

III.F.1. Dischargers shall refer to Table 4 for applicable test methods, detection limits, and reporting units.

DRAFT

9 Unless other test procedures have been specified in this General Permit or by the Water Boards.

10 Additional information regarding the SWAMP QAPrP can be found at: <https://www.waterboards.ca.gov/water_issues/programs/swamp/quality_assurance.html#qaprp>. [as of October 20, 2020]

Table 4 - Test Methods, Detection Limits and Reporting Units

Parameter	Test Method	Discharger Type	Method Detection Limit	Reporting Units
pH	Field test with calibrated portable instrument using U.S. EPA approved procedures	Risk Level 2 and 3	0.2	pH units
Turbidity	U.S. EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2 and 3	1	NTU
Non-Visible Pollutant Parameter(s)	U.S. EPA-approved test method for the specific pollutant parameter	All Risk Levels	Dependent on the test method	Dependent on the test method

III.F.2. All monitoring instruments and equipment shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Additionally, records of calibration shall be retained for at least three years and made available upon request.

III.F.3. Risk Level 2 and 3 dischargers shall perform pH analysis on-site with a calibrated pH meter using a U.S. EPA acceptable test method.

III.F.4. Risk Level 2 and 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at a State Water Board Environmental Laboratory Accreditation Program (ELAP)-accredited laboratory. Acceptable test methods include Standard Method 2130 B or U.S. EPA Method 180.1.

III.F.5. All analyses of laboratory-analyzed parameters shall be sent to and conducted at a laboratory recognized by the State Water Board Environmental Laboratory Accreditation Program (ELAP), with the exception of field analysis conducted by the discharger for turbidity and pH.

III.F.6. All dischargers shall assign a value of zero (0) for all non-visible pollutant analytical results less than the minimum level (reporting limit), as reported by the laboratory, used in calculations required by this permit (e.g., numeric action level and numeric effluent limitation exceedance determinations), so long as a sufficiently sensitive test method was used as evidenced by the reported method detection limit and minimum level.

III.G. Exceedance Response Requirements[11]

III.G.1. Dischargers are subject to the applicable numeric action levels and/or numeric effluent limitations based on their Risk Level as shown in Table 5 below.

11 Terms including, but not limited to, numeric action level, numeric effluent limitation, and exceedances are defined in Attachment B of this General Permit.

Table 5 - Numeric Action Levels and Numeric Effluent Limitations

Parameter	Discharger Type	Numeric Action Level	Numeric Effluent Limitation
pH	Risk Level 2 and 3	Lower = 6.5 Upper = 8.5	Not Applicable
Turbidity	Risk Level 2 and 3	250 NTU	Not Applicable
TMDL-related Pollutant	Responsible Dischargers with a project of any Risk Level	Refer to Table H-2 in Attachment H	Refer to Table H-2 in Attachment H

III.G.2. For pH and turbidity, the discharger shall use the field meter readings obtained from each discharge location per day of discharge to determine if there has been an exceedance of the numeric action levels.

III.G.3. Whenever analytical results indicate that the discharge is below the lower pH value, above the upper pH value, exceeds the turbidity value, or exceeds an applicable TMDL-related numeric action level or numeric effluent limitation, dischargers shall determine the source(s) of the pollutant and immediately implement corrective actions to:

a. Meet Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology requirements in 40 Code of Federal Regulations §§ 450.21 through 450.23[12]; and

b. Reduce or prevent pollutants in stormwater and authorized non-stormwater discharges from causing further exceedances.

III.G.4. Dischargers shall iterate corrective actions until the discharge is in compliance with the applicable numeric action level(s).

III.G.5. The source evaluation shall be kept with the SWPPP and specifically address what corrective actions were taken or will be taken and provide a schedule for their completion.

IV. REPORTING REQUIREMENTS

IV.A. Visual Inspections

Dischargers shall keep all completed inspection checklists and related documentation with the SWPPP on-site or electronically.

12 United States Environmental Protection Agency, Construction and Development Effluent Limitation Guidelines §§ 450.21 through 450.23, <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-N/part-450/subpart-B?toc=1> [as of June 28, 2022].

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IV.B. Water Quality Monitoring

IV.B.1. Risk Level 2 and 3 Stormwater Discharge Monitoring Reporting

IV.B.1.a. Risk Level 2 and 3 dischargers shall electronically submit through SMARTS all field sampling results within 30 days of the completion of the precipitation event or within 10 days if the field sampling results demonstrate the exceedance of the pH, and/or turbidity numeric action levels.

IV.B.1.b. Risk Level 2 and 3 dischargers that exceeded the pH and/or turbidity numeric action levels shall prepare a Numeric Action Level Exceedance Report when requested, in writing, from a Regional Water Board delegate and shall submit and certify each Numeric Action Level Exceedance Report through SMARTS within 30 days of receiving the written request, in accordance with Section IV of this General Permit's Order.

IV.B.1.c. The Numeric Action Level Exceedance Report shall include:

i. The analytical method(s), method reporting unit(s), and method detection limit(s) for each parameter;

ii. The date, place, time of sampling, visual inspections, and/or measurements, including precipitation; and

iii. An assessment of the existing BMPs associated with the sample that exceeded the numeric action level, a description of each corrective action taken including photographs, and date of implementation.

IV.B.1.d. Risk Level 2 and 3 dischargers that prepared a Numeric Action Level Exceedance Report shall retain a copy of the report for a minimum of three years after the date the exceedance report is certified and submitted.

IV.B.2. Risk Level 3 Receiving Water Monitoring Reporting

IV.B.2.a. Risk Level 3 dischargers shall electronically submit all receiving water sample results through SMARTS within 10 days of a precipitation event.

IV.B.3. Non-Visible Pollutant Monitoring Reporting

IV.B.3.a. All dischargers that conducted non-visible pollutant monitoring shall electronically submit through SMARTS all field and/or analytical sampling results within 30 days after obtaining the analytical result or within 10 days after if the analytical results demonstrate the exceedance of an applicable TMDL-related numeric action level or numeric effluent limitation or Basin Plan parameter.

IV.B.3.b. All dischargers that exceeded an applicable TMDL-related numeric action level shall prepare a Numeric Action Level Exceedance Report when requested, in writing, from a Regional Water Board delegate and shall submit and certify each Numeric Action Level Exceedance Report through SMARTS within 30 days of receiving the written request, in accordance with Section IV of this General Permit's Order.

DRAFT

IV.B.3.c. The Numeric Action Level Exceedance Report shall include:

i. The analytical method(s), method reporting unit(s), and method detection limit(s) for each parameter;

ii. The date, place, time of sampling, visual inspections, and/or measurements, including precipitation; and

iii. An assessment of the existing BMPs associated with the sample that exceeded the numeric action level, a description of each corrective action taken including photographs, and date of implementation.

IV.B.3.d. All dischargers that prepared a Numeric Action Level Exceedance Report shall retain a copy of the report for a minimum of three years after the date the exceedance report is certified and submitted.

IV.B.3.e. All dischargers that exceed an applicable TMDL-related numeric effluent limitation shall comply with the water quality-based corrective action requirements in Section VI.Q of the Order.

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