ALPINE UNION SCHOOL DISTRICT

STORMWATER POLLUTION PREVENTION PLAN

SCHOOL BUS MAINTENANCE FACILITY
1323 ADMINISTRATION WAY
ALPINE, CA 91901

Prepared by:

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7220 Trade Street, Suite 119
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Prepared for:

Alpine Union School District

1323 Administration Way
Alpine, CA 91901

INDUSTRIAL ACTIVITIES STORM WATER POLLUTION PREVENTION PLAN

for

Alpine Union School District

Facility Address:
1323 Administration Way
Alpine CA, 91901

Waste Discharger Identification Number:
9 37I018141

Exceedance Response Action Status:
Baseline

Legally Responsible Person:
Jennifer Nerat
619-445-3236

Duly Authorized Representative:
Jim Baker

Compliance Group:
San Diego County Office of Education Industrial Compliance Group
Group Leader: Annika Kubischta

Storm Water Pollution Prevention Plan (SWPPP) Prepared by:
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SWPPP Preparation Date:
August 28, 2015

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
Annual Evaluation	Annual Comprehensive Facility Compliance Evaluation
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CGL	Compliance Group Leader
ERA	Exceedance Response Action
General Permit	National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities (State Water Resources Control Board Order No. 2014-0057-DWQ; NPDES Order No. CAS000001)
LRP	Legally Responsible Person
MIP	Monitoring Implementation Plan
MS4	Municipal Separate Storm Sewer System
NOT	Notice of Termination
NSWD	Non Storm Water Discharge
PRD	Permit Registration Document
QA/QC	Quality Assurance/Quality Control
QISP	Qualified Industrial Storm Water Practitioner
QSE	Qualifying Storm Event
Regional Water Board	Regional Water Quality Control Board, San Diego Region
SMARTS	Storm Water Multiple Application and Report Tracking System
State Water Board	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
U.S. EPA	United States Environmental Protection Agency
WDID	Waste Discharger Identification Number

Legally Responsible Person

Approval and Certification of the Storm Water Pollution Prevention Plan.

Alpine Union School District

Waste Discharger Identification Number (WDID): 9 37I018141

“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."

Jennifer Nerat,	Date
Legally Responsible Person	

Amendment Log

Alpine Union School District

WDID: 9 37I018141

Amendment No.	Date	Page and Section No.	Requested By	Brief Description of Amendment; include reason for change, site location, and best management practice modifications.	Prepared and Approved By

Section 1 SWPPP Requirements

1.1 INTRODUCTION

The Alpine Union School District bus maintenance facility comprises approximately 1.5 acres and is located at 1323 Administration Way in Alpine, California. The facility location is shown on the Site Map in Appendix A.

This Storm Water Pollution Prevention Plan (SWPPP) is designed to comply with California's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities Order No. 2014-0057-DWQ; NPDES Order No. CAS000001 (General Permit), issued by the State Water Resources Control Board (State Water Board). This SWPPP has been prepared following the SWPPP Template provided on the California Stormwater Quality Association (CASQA) *Stormwater Best Management Practice Handbook Portal: Industrial and Commercial* (CASQA, 2014). In accordance with the General Permit, Section X.A, this SWPPP contains the following required elements:

- Facility Name and Contact Information;
- Site Map;
- List of Significant Industrial Materials;
- Description of Potential Pollution Sources;
- Assessment of Potential Pollutant Sources;
- Minimum Best Management Practices (BMPs);
- Advanced BMPs, if applicable;
- Monitoring Implementation Plan (MIP);
- Annual Comprehensive Facility Compliance Evaluation (Annual Evaluation); and
- Date that SWPPP was Initially Prepared and the Date of Each SWPPP Amendment, if Applicable.

1.2 PERMIT REGISTRATION DOCUMENTS

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

- Notice of Intent;
- Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal);
- Site Map(s);
- SWPPP; and
- Annual Fee.

The Site Map can be found in Appendix A. Copies of the submitted PRDs are also kept in Appendix B of the SWPPP along with the Waste Discharger Identification Number (WDID) confirmation. The SWPPP uploaded into SMARTS does not include a copy of the General Permit. In the event of future significant changes to the facility layout, the Discharger will certify and submit new PRDs via SMARTS.

1.3 SWPPP AVAILABILITY AND IMPLEMENTATION

The SWPPP is available on-site to all employees during all hours of operation (see Section 2.5 for the Operations Schedule), and will be made available upon request by a State or Municipal inspector. The SWPPP will be implemented by July 1, 2015.

1.4 POLLUTION PREVENTION TEAM

Bus maintenance facility staff designated as Pollution Prevention Team members are listed below in Table 1.1., along with their responsibilities and duties. This includes alternate team members, who will perform SWPPP activities when the primary Pollution Prevention Team members are absent or unavailable. This table will be updated as needed when there are changes to staff and staff responsibilities. All team members will be trained to perform the duties assigned to them. Employee training logs are provided in Appendix C. Any Duly Authorized Representatives responsible for any component of SWPPP implementation and authorized by the facility LRP are listed below. Written authorizations from the LRP for these individuals are provided in Appendix D.

In the event that the facility enters Level 1 status, a Qualified Industrial Storm Water Practitioner (QISP) will have primary responsibility for providing training to the appropriate team members assigned to perform the activities required in this SWPPP, and will be identified in Appendix D.

Table 1.1 Pollution Prevention Team

Task	Name, Title
Overall SWPPP Implementation Coordination	Jennifer Nerat, Legally Responsible Person
Visual Observations	Jim Baker, Maintenance Supervisor
Weather Tracking	Jim Baker, Maintenance Supervisor
Sample Collection	Jim Baker, Maintenance Supervisor
Annual Comprehensive Facility Evaluation	Jim Baker, Maintenance Supervisor; Annika Kubischta, Compliance Group Leader
Monitoring Implementation Alternate(s)	Terri Thompson, Transportation Supervisor
Training	Jim Baker, Maintenance Supervisor; Annika Kubischta, Compliance Group Leader
Duly Authorized Representative(s)	Jim Baker, Maintenance Supervisor

1.5 DULY AUTHORIZED REPRESENTATIVES

Duly Authorized Representatives, where utilized, may be assigned some responsibility for SWPPP implementation, and have authority to sign PRDs. Jim Baker is currently a Duly Authorized Representatives for this facility.

1.6 PERMITS AND GOVERNING DOCUMENTS

In addition to the General Permit, the following documents have been taken into account while preparing this SWPPP:

- Regional Water Quality Control Board, San Diego Region (Regional Water Board) requirements;
- Basin Plan requirements;
- Total Maximum Daily Load (TMDL) Requirements;
- Spill Prevention Control and Countermeasures Plan;
- Hazardous Material Business Plan;
- Hazardous Waste Regulations and Permits;
- Air Quality Regulations and Permits; and
- Clean Water Act Section 401 Water Quality Certifications and 404 Permits.

1.7 SWPPP AMENDMENTS

This SWPPP will be amended or revised as needed. A list of amendments (Amendment Log) is included in the front of this SWPPP, and amendment certifications are included in Appendix E. The Amendment Log will include the date of initial preparation and the date of each amendment. The SWPPP should be revised when:

- There is a General Permit violation;
- There is a reduction or increase in the total industrial area exposed to storm water;
- BMPs do not meet the objectives of reducing or eliminating pollutants in storm water discharges;
- There is a change in industrial operations which may affect the discharge of pollutants to surface waters, groundwater, or a municipal separate storm sewer system (MS4);
- There is a change to the parties responsible for implementing the SWPPP; or
- Otherwise deemed necessary by the QISP.

The following items will 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; and
- The new BMP(s) proposed.

Amendments will be logged at the front of the SWPPP and certification kept in Appendix E. The SWPPP text will be revised replaced, and/or hand annotated as necessary to properly convey the amendment. SWPPP amendments must be certified and submitted by the LRP or their designated Duly Authorized Representative via SMARTS within 30 days whenever the SWPPP contains significant revisions. With the exception of significant revisions, SWPPP changes will be certified and uploaded to SMARTS once every three (3) months in the reporting year.

1.8 RETENTION OF RECORDS

Paper or electronic records of documents required by this SWPPP will be retained for a minimum of five (5) years from the date generated or date submitted, whichever is later, for the following items:

- Employee Training Records;
- BMP Implementation Records;
- Spill and Clean-up Related Records;
- Records of Sampling and Analysis Information
    - The date, exact location, and time of sampling or measurement;
    - The date(s) analyses were performed;
    - The individual(s) that performed the analyses;
    - The analytical techniques or methods used; and
    - The results of such analyses;
- Records of Visual Observations
    - The date;
    - The industrial areas/drainage areas of the facility observed during the inspection (Location);
    - The approximate time of the observation;
    - Presence and probable source of observed pollutants; and
    - Name of the individual(s) that conducted the observations;
- Response to the observations including identification of SWPPP revisions if needed;
- Level 1 Exceedance Response Action (ERA) Reports;
- Level 2 ERA Action Plan;
- Level 2 ERA Technical Report; and
- Annual Reports from SMARTS (checklist and any explanations).

Copies of these records will be available for review by State and Regional Water Board staff at the Alpine Union School District bus maintenance facility during scheduled facility operating hours. Upon written request by the United States Environmental Protection Agency (U.S. EPA) or the local MS4 owner, the Alpine Union School District will provide paper or electronic copies of requested records to the State and Regional Water Boards, U.S. EPA, or local MS4 owner within ten (10) working days from receipt of the request.

1.9 EXCEEDANCE RESPONSE ACTIONS

If a General Permit Numeric Action Level exceedance occurs in a given reporting year, a Level 1 ERA Evaluation and a Level 1 ERA Report will be required in the following year, or, if in a subsequent year, a Level 2 ERA Action Plan and a Level 2 ERA Report will be required in accordance with the General Permit. The results of either of the ERA reports may require that the SWPPP be amended.

1.10 ANNUAL EVALUATION

An Annual Evaluation will be conducted by the Compliance Group Leader (CGL), and appropriate Alpine Union School District bus maintenance facility Pollution Prevention Team member(s) once during each reporting year (July 1 to June 30), in accordance with Section XV of the General Permit. Annual Evaluations will be conducted at least eight (8) months and not

more than sixteen (16) months after the previous Annual Evaluation. The planned window for conducting the Annual Evaluation is between November and May of each year. The SWPPP will be revised, as appropriate, based on the results of the Annual Evaluation, and the revisions will be implemented within 90 days of the Annual Evaluation.

At a minimum, Annual Evaluations will consist of:

- A review of all sampling, visual observation, and inspection and monitoring records and sampling and analysis results conducted during the previous reporting year;
- A visual inspection of all areas of industrial activity and associated potential pollutant sources for evidence of, or the potential for, pollutants entering the storm water conveyance system;
- A visual inspection of all drainage areas previously identified as having no exposure to industrial activities and materials in accordance with the definitions in Section XVII;
- A visual inspection of equipment needed to implement the BMPs;
- A visual inspection of any BMPs;
- A review and effectiveness assessment of all BMPs for each area of industrial activity and associated potential pollutant sources to determine if the BMPs are properly designed, implemented, and are effective in reducing and preventing pollutants in industrial storm water discharges and authorized non storm water discharges (NSWDs); and
- An assessment of any other factors needed to comply with the Annual Reporting requirements in General Permit Section XVI.B.

1.11 ANNUAL REPORT

The Annual Report will be prepared, certified, and electronically submitted no later than July 15th following each reporting year using the standardized format and checklists in SMARTS based on the reporting requirements identified in Section XVI of the General Permit. Annual reports will be submitted in SMARTS and in accordance with information required by the on-line forms.

1.12 TERMINATION AND CHANGES TO GENERAL PERMIT COVERAGE

When any of the following conditions occur, termination of coverage under the General Permit will be requested by certifying and submitting a Notice of Termination (NOT) via SMARTS:

- Operation of the facility has been transferred to another entity;
- The facility has ceased operations, completed closure activities, and removed all industrial related pollutant generating sources; or
- The facility's operations have changed and are no longer subject to the General Permit.

The SWPPP and all of the provisions of the General Permit will be complied with until a valid NOT is received and accepted by the Board.

If ownership changes, the new owner of the facility will be notified of the General Permit and regulatory requirements for permit coverage.

Section 2 Facility Information

2.1 FACILITY DESCRIPTION

2.1.1 Facility Location

The Alpine Union School District bus maintenance facility encompasses approximately 1.5 acres, and is located at 1323 Administration Way, in Alpine, California. This location is within the San Diego River watershed, and is approximately 4.2 miles upstream of El Capitan Reservoir via Alpine Creek. El Capitan Reservoir is listed on the Clean Water Act Section 303(d) List of Water Quality Limited Segments as impaired for color, manganese, and pH with a TMDL expected to be completed in 2019, and for total nitrogen as N and phosphorus, which are expected to have a TMDL completed in 2021.

The bus maintenance facility is located at latitude 33.836722 and longitude -116.774791, and is identified on the Site Map in Appendix A.

2.1.2 Facility Operations

The Alpine Union School District provides pupil transportation services primarily to and from school. This activity is assigned the Standard Industrial Classification code of 4151, in the category of transportation facilities. Transportation facilities are subject to the General Permit when conducting industrial activities, which include vehicle maintenance, fueling, and washing, onsite. Operations at the Alpine Union School District bus maintenance facility include the following industrial activities in support of school bus transportation:

- Engine Servicing
- Transmission Servicing
- Brake Maintenance
- Tire Maintenance
- Fluid Changes
- Bus Washing

This bus maintenance facility serves approximately 8 school buses, although this number can fluctuate in accordance with District needs.

2.1.3 Existing Conditions

The Alpine Union School District bus maintenance facility site contains several enclosed administration buildings, an enclosed bus servicing garage, an outdoor concrete pad used for minor bus servicing and washing, and unpaved driveway and parking areas. Landscaping is present in front of the westernmost administration building. All unpaved areas have been stabilized using vegetation or gravel. Bus washing and bus servicing areas are exposed to precipitation and storm water runoff at the facility when performed on the concrete pad between administration buildings. Existing BMPs to reduce or eliminate pollutant exposure at this facility are described in Section 3.

There are no known historic sources of contamination at the site.

2.1.4 Description of Drainage Areas and Existing Drainage

The Alpine Union School District bus maintenance facility contains one drainage area (A) in which all exposed industrial activities occur. As shown on the Site Map in Appendix A, this area drains to discharge point 001, which is included as a monitoring location. Additional drainage areas in which exposed industrial activities do not occur are also shown on the Site Map. The Site Map shows the area layout, including the general site topography, storm drainage system, drainage inlets, drainage areas, and discharge locations. Table 2.1, below, provides additional detail regarding drainage areas at the facility.

Table 2.1 Facility Drainage Areas and Locations

Drainage Area	Discharge Location	Drainage Area Description
A	001	Drainage area A discharges to point 001, and includes the concrete pad between administration buildings, where all exposed industrial activities occur.
B	002	Drainage area B discharges to point 002, and includes the gravel diveway and parking areas, and the enclosed bus servicing garage.
C	003	Drainage area C discharges to point 003, and includes gravel parking areas, and administrative facilities.

The bus maintenance facility site is relatively flat where industrial activities occur. The site slopes to the southwest toward the facility parking area and driveways. The elevation of the facility ranges from 1,768 to 1,771 feet above mean sea level (msl). Surface drainage at the site currently flows to the southwest.

2.1.5 Storm Water Run-On from Offsite Areas

There is no anticipated run-on to this site from areas outside the facility boundary, due to surrounding areas being lower in elevation than the facility. The field to the east is slightly higher elevation, but drains south, away from the facility.

2.2 OPERATIONS SCHEDULE

The Alpine Union School District bus maintenance facility operates Monday through Friday from the hours of 7:00 am to 4:00 pm with the exception of holidays. Industrial activities during this time period include all activities listed in Section 2.1.2 as needed.

This SWPPP will be implemented, and a copy made available to all bus maintenance facility staff at all times. A copy will be available to regulatory agency personnel upon request.

If industrial activities are temporarily suspended for ten (10) or more consecutive calendar days during a reporting year, BMPs that are necessary to achieve compliance with this General Permit during the temporary suspension of the industrial activity will be identified and incorporated into the SWPPP.

2.3 POLLUTANT SOURCE ASSESSMENT

This section presents a list of all industrial materials and potential pollutant sources at the Alpine Union School District bus maintenance facility. It identifies specific pollutants associated with

these sources and pollutant sources that are most susceptible to storm water exposure. A summary of significant spills and leaks that have occurred onsite is also provided.

2.3.1 Description of Potential Pollutant Sources

Table 2.2 includes a list of industrial activities and associated materials that are anticipated to be used onsite. These activities and associated materials could potentially contribute pollutants to storm water runoff. The industrial activities, potential for exposure, and the associated pollutants provided in Table 2.2 are the basis for selecting the BMPs for the bus maintenance facility as described in Section 3. Materials stored onsite, including quantity, physical characteristics, and location are provided in Table 2.3. Locations of all material storage areas, industrial activities, and other site features are shown on the Site Map in Appendix A.

Table 2.2 Industrial Activities and Associated Materials

Industrial Activity	Associated Industrial Materials	Storm Water Exposure Potential
Engine Servicing	Oil and grease, Antifreeze, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc)	There is a low likelihood that industrial materials associated with this will be present in industrial storm water discharges. The activity iteself, and the storage of related waste materials, occurs primarily within the enclosed garage, where pollutants are not exposed. Infrequently, this activity may be conducted on the outdoor concrete pad, where any residual pollutants not removed through BMP implementation may be mobilized by storm water. This activity is not conducted in this area during storm events.
Transmission Servicing	Transmission Fluid, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc)	There is a low likelihood that industrial materials associated with this will be present in industrial storm water discharges. The activity iteself, and the storage of related waste materials, occurs primarily within the enclosed garage, where pollutants are not exposed. Infrequently, this activity may be conducted on the outdoor concrete pad, where any residual pollutants not removed through BMP implementation may be mobilized by storm water. This activity is not conducted in this area during storm events.
Brake Maintenance	Heavy Metals (Copper)	Industrial materials associated with this activity are unlikely to be present in industrial storm water discharges, as the activity iteself, and the storage of related waste materials, occurs within the enclosed garage, where pollutants are not exposed. Brakes are also sprayed down with brake cleaner prior to removal, to reduce dust generation.
Tire Maintenance	Heavy Metals (Zinc, Copper)	There is a low likelihood that industrial materials associated with this will be present in industrial storm water discharges. The activity iteself, and the storage of related waste materials, occurs primarily within the enclosed garage, where pollutants are not exposed. Infrequently, this activity may be conducted on the outdoor concrete pad, where any residual pollutants not removed through BMP implementation may be mobilized by storm water. This activity is not conducted in this area during storm events.
Fluid Changes	Oil and grease, Antifreeze, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc)	There is a low likelihood that industrial materials associated with this will be present in industrial storm water discharges. The activity iteself, and the storage of related waste materials, occurs primarily within the enclosed garage, where pollutants are not exposed. Infrequently, this activity may be conducted on the outdoor concrete pad, where any residual pollutants not removed through BMP implementation may be mobilized by storm water. This activity is not conducted in this area during storm events.
Bus Washing	Soap, Oil and Grease, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc), Sediment	There is a low likelihood that industrial materials associated with this will be present in industrial storm water discharges. This activity is conducted on the outdoor concrete pad, and all wastewater is collected and disposed of to the sewer. Only residual pollutants not completely removed through this process may be mobilized by storm water. This activity does not occur during storm events.

Table 2.3 Industrial Material Quantity and Location

Industrial Material	Material Physical Characteristics	Material Quantity	Material Location	Associated Pollutants
Motor Oil (New)	Fluid	110 gallons	Enclosed garage. Used oil is not stored on the facility, as it is removed from the facility by the mobile mechanic following maintenance activities.	Oil
Antifreeze (New)	Fluid	55 gallons	Enclosed garage. Used antifreeze is not stored on the facility, as it is removed from the facility by the mobile mechanic following maintenance activities.	Ethylene Glycol
Tires	Solid	5	Enclosed garage.	Cadmium, Copper, and Zinc

2.3.2 Significant Spills and Leaks

In the previous five-year period, no significant spills or leaks have occurred at the Alpine Union School District bus maintenance facility.

Table 2.3 includes a list of industrial materials, and includes material characteristics, quantities, locations, and associated pollutants. All materials in this table listed as having liquid characteristics have the potential for spills and leaks to occur. Spills and leaks are prevented by implementing the BMPs described in Section 3.

2.4 IDENTIFICATION OF NSWDS

NSWDs consist of discharges that do not originate from precipitation events. The General Permit provides allowances for specified NSWDs provided they do not cause erosion, carry other pollutants, are not prohibited by the local MS4, and do not require a separate NPDES Permit from the Regional Water Board. NSWDs into storm drainage systems or waterways, which are not authorized under the General Permit and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

There are no NSWDs that are authorized at the Alpine Union School District bus maintenance facility.

Monthly visual observations will be conducted according to the General Permit (Section XI.A.1) for NSWDs and sources to ensure adequate BMP implementation and effectiveness. Monthly visual observations include observations for evidence of unauthorized NSWDs.

Activities at this site that may result in unauthorized NSWDs include:

- Engine Servicing
- Transmission Servicing
- Fluid Changes
- Bus Washing

No NSWDs have occurred at the Alpine Union School District bus maintenance facility in the past 5 years, and none are anticipated to occur. Steps have been taken, including the implementation of appropriate BMPs as defined in Section 3, to ensure that unauthorized NSWDs do not occur. In the event that a NSWD is identified, appropriate BMPs will be implemented, or updated as necessary to eliminate current and subsequent discharge.

2.5 REQUIRED SITE MAP INFORMATION

The bus maintenance facility's Site Map is provided in Appendix A, and includes all information required by the General Permit. The map includes information regarding the facility boundary and storm water drainage areas, nearby water bodies, locations of storm water collection and conveyance systems including outfalls, locations and descriptions of all industrial activities and materials, and locations and descriptions of all structural control measures, as applicable.

A summary of all information provided in the Site Map(s) is provided in Table 2.4 below.

Table 2.4 Required Site Map(s) Information Checklist

Included on Site Map? (Yes/No/ NA)	**Required Element**
Yes	The facility boundary
Yes	Storm water drainage areas within the facility boundary
N/A	Portions of any drainage area impacted by discharges from surrounding areas
Yes	Flow direction of each drainage area
N/A	On-facility surface water bodies
N/A	Areas of soil erosion
N/A	Location(s) of nearby water bodies (such as rivers, lakes, wetlands, etc.)
N/A	Location(s) of municipal storm drain inlets that may receive the facility's industrial storm water discharges and authorized NSWDs
Yes	Locations of storm water collection and conveyance systems and associated points of discharge, and direction of flow
Yes	Any structural control measures (that affect industrial storm water discharges, authorized NSWDs, and run-on)
Yes	All impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures
N/A	Locations where materials are directly exposed to precipitation
N/A	Locations where significant spills or leaks (Section X.G.1.d of the General Permit) have occurred
Yes	Areas of industrial activity subject to the General Permit
Yes	All storage areas and storage tanks
N/A	Shipping and receiving areas
N/A	Fueling areas
Yes	Vehicle and equipment storage/maintenance areas
N/A	Material handling and processing areas
Yes	Waste treatment and disposal areas
Yes	Dust or particulate generating areas
Yes	Cleaning and material reuse areas
Yes	Any other areas of industrial activity which may have potential pollutant sources

Section 3 Best Management Practices

3.1 MINIMUM BMPs

All minimum BMPs that are required by the General Permit and necessary to meet the facility conditions will be implemented. Guidance for BMP implementation is provided in the CASQA Stormwater BMP Handbook Portal: Industrial and Commercial Fact Sheets and the relevant fact sheets are included in Appendix F. Sections 3.1.1 through 3.1.5 list the requirements for each of these minimum BMPs, in addition to some facility-specific implementation detail. Minimum BMPs will be implemented for additional targeted industrial activities, equipment, and materials as necessary. If any of the required minimum BMPs are applicable but cannot be implemented, an explanation and alternative approach will be provided in the following sections.

Table 3.1 provides a list of the five minimum General Permit BMP elements that are included in the relevant BMP fact sheets and indicates which BMPs are implemented at the bus maintenance facility. Employee Training, described in Section 3.1.6, and Quality Assurance and Record Keeping, described in Section 3.1.7, are additional minimum BMPs that will be implemented.

As required by the General Permit, a summary of all implemented BMPs is included in Section 3.3. The schedule for BMP implementation and the requirements for inspection and maintenance are contained in Section 4.

Table 3.1 Minimum BMPs

CASQA Fact Sheet Number	CASQA BMP Fact Sheet Name	Minimum General Permit BMP Requirements Addressed					BMP Implemented? (Yes/No/N/A)
		Good Housekeeping	Preventative Maintenance	Spill and Leak Prevention and Response	Material Handling and Waste Management	Erosion and Sediment Control	
SC-10	Non-Storm Water Discharges	✓		✓			Yes
SC-11	Spill Prevention, Control, and Cleanup			✓			Yes
SC-20	Vehicle and Equipment Fueling	✓	✓	✓	✓		N/A
SC-21	Vehicle and Equipment Cleaning	✓	✓	✓	✓		Yes
SC-22	Vehicle and Equipment Maintenance and Repair	✓	✓	✓	✓		Yes
SC-30	Outdoor Loading and Unloading	✓		✓	✓		N/A
SC-31	Outdoor Liquid Container Storage	✓	✓	✓	✓		N/A
SC-32	Outdoor Equipment Operations	✓	✓	✓	✓		Yes
SC-33	Outdoor Storage of Raw Materials	✓	✓	✓		✓	N/A
SC-34	Waste Handling and Disposal	✓	✓	✓	✓		Yes
SC-35	Safer Alternative Products						No
SC-40	Contaminated or Erodible Surfaces					✓	Yes
SC-41	Building and Grounds Maintenance	✓		✓	✓		Yes
SC-42	Building Repair, Remodeling, and Construction	✓		✓	✓	✓	Yes
SC-43	Parking Area Maintenance	✓	✓	✓			Yes
SC-44	Drainage System Maintenance	✓	✓	✓			Yes

3.1.1 Good Housekeeping

The following good housekeeping measures will be implemented in accordance with the General Permit (Section X.H.1.a):

- All outdoor areas associated with industrial activity, including storm water discharge locations, drainage areas, conveyance systems, waste handling/disposal areas, and perimeter areas impacted by off-facility materials or storm water run-on, are regularly observed to determine housekeeping effectiveness. Observations are recorded formally on monthly observation forms, found in MIP Attachment 3. Housekeeping efforts, methods, and/or frequencies are updated in response to observed conditions. Any identified debris, waste, spills, tracked materials, or leaked materials will be cleaned promptly and disposed of properly;
- Material tracking is minimized through prompt spill cleanup, sweeping, and/or mopping, as appropriate;
- Dust generated from industrial materials or activities is minimized and prevented from leaving the site via aerial or storm water transport by completing dust-generating activities, such as brake maintenance or metal grinding, in indoor areas. Additionally, brake cleaner may be used to prevent brake dust from being generated during maintenance;
- All facility areas where washing or rinsing occur are monitored for overspray, spills, or residue, and cleaned as soon as possible;
- All stored industrial materials that can be readily mobilized by contact with storm water are covered and/or contained typically at all times when not actively in use, but at a minimum, prior to and during storm events;
- No non-solid industrial materials or wastes (e.g., particulates, powders, etc.) that can be transported or dispersed via wind or contact with storm water are stored at the bus maintenance facility;
- Rinse/wash waters or industrial materials are disposed of to the sanitary sewer, or an authorized waste hauler, and never to the storm water conveyance system;
- Storm water discharges from non-industrial areas, that would otherwise contact industrial areas of the facility, are minimized through flow diversion where feasible; and
- No NSWDs have been authorized for the bus maintenance facility.

BMPs to be implemented are summarized in Table 3.1 and the BMP fact sheets are included in Appendix F.

3.1.2 Preventative Maintenance

The following preventative maintenance measures will be implemented in accordance with the General Permit (Section X.H.1.b):

- All equipment and systems used outdoors with the potential to spill or leak pollutants have been identified, and these include school buses;
- Bus maintenance occurs every 3,000 miles or 45 days, whichever occurs first, in accordance with Title 13 of the California Code of Regulations; and

- Bus drivers complete pre and post-trip checks to visually observe that the bus is in working order and free of any fluid leaks. Should leaks or other conditions that require maintenance be observed, the driver reports the condition to their supervisor or directly to the lead mechanic so that maintenance and repair can be performed promptly and leaked materials cleaned.

Specific preventative maintenance BMPs to be implemented at the facility are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

3.1.3 Spill and Leak Prevention and Response

The following spill and leak prevention and response measures will be implemented in accordance with the General Permit (Section X.H.1.c):

- Procedures and/or controls to minimize spills and leaks have been established and are being implemented as necessary, including the placement of drip pans beneath vehicles as needed, storage of liquids within containment areas, and regular vehicle maintenance every 3,000 miles or 45 days (whichever occurs first, in accordance with Title 13 of the California Code of Regulations);
- Spill and leak response procedures have been developed and are currently being implemented to prevent industrial materials from discharging through the storm water conveyance system. Spilled or leaked industrial materials are cleaned promptly utilizing on-site absorbent materials, and disposed of properly, utilizing a hazardous waste hauler where necessary;
- All spill and leak response materials and equipment are located in close proximity to areas where liquids are stored and/or handled;
- Spill or leak response equipment maintenance procedures are clearly described in training materials; and
- Facility personnel responsible for spill and leak response are provided with formal training a minimum of once per year.

Specific spill and leak prevention and response BMPs to be implemented at the Alpine Union School District bus maintenance facility are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

3.1.4 Material Handling and Waste Management

The following material handling and waste management measures will be implemented in accordance with the General Permit (Section X.H.1.d):

- Industrial materials or wastes that can be readily mobilized by contact with storm water are covered and/or contained, at minimum, prior to and during storm events, and activities that may result in the exposure of these materials are not conducted during storm events wherever possible;
- No non-solid industrial materials or wastes (e.g., particulates, powders, etc.) that can be transported or dispersed via wind or contact with storm water are stored at the bus maintenance facility;

- Industrial waste disposal containers and industrial material storage containers that contain industrial materials are contained within structures that do not receive rainfall or run-on;
- No material stockpiles are stored at the bus maintenance facility;
- All spills of industrial materials or wastes that occur during handling are promptly cleaned in accordance with the spill response procedures (Section X.H.1.c); and
- Any outdoor material or waste handling equipment or containers that can be contaminated by contact with industrial materials or wastes are observed regularly, and cleaned or covered as necessary to prevent storm water contact with pollutants.

Specific material handling and waste management BMPs to be implemented at the Alpine Union School District bus maintenance facility are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

3.1.5 Erosion and Sediment Controls

The following erosion and sediment control measures will be implemented in accordance with the General Permit (Section X.H.1.e):

- Wind erosion is controlled through the stabilization of unpaved areas, by the application of vegetation, mulch, and/or gravel, or through other effective methods;
- Should any soils be disturbed or otherwise become unstabilized, erosion control measures, such as fiber rolls, sand or gravel bags, or silt fences, will be deployed prior to a forecasted storm event;
- The perimeter of the bus maintenance facility has been stabilized, including all entrance and exit areas, to control the discharge or tracking of erodible materials offsite; and
- Run-on and storm water generated from within the facility is directed away from areas where such flows could cause erosion.

Specific erosion and sediment control BMPs to be implemented at the Alpine Union School District bus maintenance facility are provided in Table 3.1 and the BMP fact sheets are included in Appendix F.

3.1.6 Employee Training Program

An employee training program will be implemented in accordance with the following requirements in the General Permit (Section X.H.1.f):

- All personnel implementing the various compliance activities of this SWPPP are properly trained in topics including but not limited to: BMP implementation, BMP effectiveness evaluations, visual observations, and monitoring activities;
- Training materials are updated annually, with hard copies provided to personnel during training and electronic copies available year-round;
- Personnel designated as Pollution Prevention Team members are made aware of their specific responsibilities, and trained annually on the performance of designated tasks;
- Formal training is provided once per year for all applicable personnel;
- Informal guidance is provided by the CGL as needed where questions may arise; and
- Documentation of all completed training, and the personnel that received training, are retained in the SWPPP, see Appendix C.

Task specific training for all employees engaged in activities that have the potential to cause storm water pollution will be conducted when new employees are hired, and refresher training is provided annually.

This facility is currently at the Baseline ERA compliance level. In the event that the facility enters Level 1 ERA status, a QISP will have primary responsibility for providing training to the appropriate team members assigned to perform the activities required in this SWPPP. The QISP will be responsible for providing information during training sessions and subsequently completing the training logs shown in Appendix C, which identifies the site-specific storm water topics covered as well as the names of site personnel who attended the meeting. Each team member will be trained in the specific role they are responsible to undertake.

3.1.7 Quality Assurance and Record Keeping

The following quality assurance and record keeping activities will be performed in accordance with the requirements in the General Permit (Section X.H.1.g):

- The LRP regularly checks in with Pollution Prevention Team members to ensure that all elements of the SWPPP are being implemented in a timely manner, including the MIP (SWPPP Section 5);
- The CGL provides periodic reminders and guidance;
- Annual Evaluations are conducted by the CGL, during which time the implementation of all SWPPP components is verified;
- BMPs identified in the SWPPP are tracked and recorded on the monthly observation forms;
- Paper or electronic records of documents required by this SWPPP will be retained for a minimum of five (5) years from the date generated or date submitted, whichever is later, as required in the General Permit (Section XXI.J.4) for the following items:
    - Employee Training Records;
    - BMP Implementation Records;
    - Spill and Clean-up Related Records;
    - Records of Monitoring Information
        - The date, exact location, and time of sampling or measurement;
        - The date(s) analyses were performed;
        - The individual(s) that performed the analyses;
        - The analytical techniques or methods used; and
        - The results of such analyses;
    - Level 1 ERA Reports;
    - Level 2 ERA Action Plan;
    - Level 2 ERA Technical Report; and
    - Annual Reports;
- BMPs will be implemented according to the schedule and procedures presented in SWPPP Section 4. BMPs will be implemented by properly trained team members as documented in Appendix C; and
- Visual observations will be performed monthly as described in SWPPP Section 5.5. Potential pollutant sources and BMPs will be inspected during visual observations, and new BMPs will be implemented as needed.

3.2 ADVANCED BMPS

3.2.1 Exposure Minimization BMPs

Storm resistant shelters are installed onsite to prevent the contact of storm water with industrial activities and material. The locations of these shelters and associated industrial activities and materials are presented in Table 3.2.

Table 3.2 Exposure Minimization BMPs

Shelter Location/Description	Associated Industrial Activity/Material
Enclosed Service Bay	• Engine Servicing • Transmission Servicing • Brake Maintenance • Tire Maintenance • Fluid Changes

The only industrial activities not conducted within a storm-resistant shelter are bus washing and occasional minor bus servicing, which occur on the exposed concrete pad between administration buildings. The size of school buses makes the construction of storm-resistant shelters capable of housing all of these activities cost-prohibitive and impractical for the District.

3.2.2 Storm Water Containment and Discharge Reduction BMPs

Storm water containment and discharge reduction BMPs include BMPs that divert, reuse, contain, or reduce the volume of storm water runoff. Specific storm water containment and discharge reduction BMPs to be implemented at the Alpine Union School District bus maintenance facility are provided in Table 3.3 and the BMP fact sheets are included in Appendix F.

Table 3.3 Storm Water Containment and Discharge Reduction BMPs

CASQA Fact Sheet Number	CASQA BMP Fact Sheet Name	Meets Advanced BMP Requirement	BMP Used (Yes/No)	BMP Location, Runoff Sources, and Potential Pollutants
TC-10	Infiltration Trench	✓	No	
TC-11	Infiltration Basin	✓	No	
TC-12	Harvest and Reuse	✓	No	
TC-20	Wet Pond	✓	No	
TC-21	Constructed Wetland	✓	No	
TC-22	Extended Detention Basin	✓	No	
TC-30	Vegetated Swale		Yes	Immediately upstream of Discharge point 001; receiving runoff from the exposed concrete pad. Potential pollutants include Soap, Oil and Grease, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc), Sediment
TC-31	Vegetated Buffer Strip		No	
TC-32	Bioretention	✓	No	
TC-40	Media Filter	✓	No	
TC-50	Water Quality Inlet		No	
TC-60	Multiple Systems	✓	No	
MP-20	Biotreatment		No	
MP-40	Storm Water Filter		No	
MP-50	Wet Vault		No	
MP-51	Gravity Separator		No	
MP-52	Drain Inlet Insert		Yes	Upstream of Discharge point 001, a drain inlet insert has been installed to remove debris and sediment prior to discharging to the vegetated swale. Potential pollutants include Soap, Oil and Grease, Residual Heavy Metals (Cadmium, Copper, Lead, Nickel, Zinc), Sediment

3.2.3 Treatment Control BMPs

Treatment control BMPs include one or more mechanical, chemical, biologic, physical, or any other treatment process technology and is sized to meet the treatment control design storm standard. No treatment control BMPs are implemented at the Alpine Union School District bus maintenance facility.

3.2.4 Other Advanced BMPs

No other advanced BMPs are implemented at the Alpine Union School District bus maintenance facility.

3.3 BMP SUMMARY TABLE

Table 3.4 summarizes the industrial activities, materials, pollutant sources, potential pollutants, and BMPs being implemented to prevent discharge of pollutants in storm water runoff. Descriptions of the specific BMPs being implemented were provided in previous subsections. Implementation and maintenance of BMPs is described in Section 4.

Table 3.4 BMP Summary Table

Industrial Activity	Pollutant Sources	Potential Pollutants	BMPs Implemented	CASQA BMP Fact Sheet Number(s)	Required Equipment and Tools
Engine Servicing	Engine dust; Automotive fluids; Batteries	Cadmium Copper Lead Nickel Zinc Oil & Grease pH effects	• Engine servicing occurs primarily within service bays, where pollutants are not exposed to storm water. If performed outdoors, drip pans and other precautions are used, and the area is cleaned where needed following the activity. • Materials are prevented from tracking outside of service bays through prompt spill cleanup, regular sweeping and/or mopping of service bay floors and aprons. • Preventative bus maintenance occurs every 3,000 miles or 45 days, whichever occurs first. • Bus drivers complete pre and post-trip checks to visually observe that the bus is in working order and free of any fluid leaks. Should leaks or other conditions that require maintenance be observed, the driver reports the condition to their supervisor or directly to the lead mechanic so that maintenance and repair can be performed promptly and leaked materials cleaned. • Drip pans are placed under buses that are leaking or undergoing repair, to collect automotive fluids. • Outdoor work areas discharge to an inlet insert and vegetated swale to remove residual pollutants prior to discharge off-site.	SC-10 SC-11 SC-22 SC-34 SC-41 SC-43 SC-44 TC-30 MP-52	Absorbent; Broom; Mop; Drip pans

Industrial Activity	Pollutant Sources	Potential Pollutants	BMPs Implemented	CASQA BMP Fact Sheet Number(s)	Required Equipment and Tools
Fluid Changes	Automotive fluids	Cadmium Copper Lead Nickel Zinc Oil & Grease	• Fluid changes occur primarily within service bays, where pollutants are not exposed to storm water. If performed outdoors, drip pans and other precautions are used, and the area is cleaned where needed following the activity. • Materials are prevented from tracking outside of service bays through prompt spill cleanup, regular sweeping and/or mopping of service bay floors and aprons. • Preventative bus maintenance occurs every 3,000 miles or 45 days, whichever occurs first. • Bus drivers complete pre and post-trip checks to visually observe that the bus is in working order and free of any fluid leaks. Should leaks or other conditions that require maintenance be observed, the driver reports the condition to their supervisor or directly to the lead mechanic so that maintenance and repair can be performed promptly and leaked materials cleaned. • Drip pans are placed under buses to collect automotive fluids during fluid changes. • Outdoor work areas discharge to an inlet insert and vegetated swale to remove residual pollutants prior to discharge off-site.	SC-10 SC-11 SC-22 SC-34 SC-41 SC-43 SC-44 TC-30 MP-52	Absorbent; Broom; Mop; Drip pans

Industrial Activity	Pollutant Sources	Potential Pollutants	BMPs Implemented	CASQA BMP Fact Sheet Number(s)	Required Equipment and Tools
Transmission Servicing	Automotive fluids	Cadmium Copper Lead Nickel Zinc Oil & Grease	• Transmission servicing occurs primarily within service bays, where pollutants are not exposed to storm water. If performed outdoors, drip pans and other precautions are used, and the area is cleaned where needed following the activity. • Materials are prevented from tracking outside of service bays through prompt spill cleanup, regular sweeping and/or mopping of service bay floors and aprons. • Preventative bus maintenance occurs every 3,000 miles or 45 days, whichever occurs first. • Bus drivers complete pre and post-trip checks to visually observe that the bus is in working order and free of any fluid leaks. Should leaks or other conditions that require maintenance be observed, the driver reports the condition to their supervisor or directly to the lead mechanic so that maintenance and repair can be performed promptly and leaked materials cleaned. • Drip pans are placed under buses that are leaking or undergoing repair, to collect automotive fluids. • Outdoor work areas discharge to an inlet insert and vegetated swale to remove residual pollutants prior to discharge off-site.	SC-10 SC-11 SC-22 SC-34 SC-41 SC-43 SC-44 TC-30 MP-52	Absorbent; Broom; Mop; Drip pans
Brake Maintenance	Brake dust	Copper	• Brake maintenance occurs within service bays, where pollutants are not exposed to storm water. • Materials are prevented from tracking outside of service bays through prompt spill cleanup, regular sweeping and/or mopping of service bay floors and aprons. • Brakes are sprayed down with brake cleaner prior to removal, to reduce dust generation. • Brake maintenance is not conducted in areas where wind may transport brake dust, when conditions are windy.	SC-43 SC-44	Brake cleaner; Broom; Mop
Tire Maintenance	Used tires	Copper Zinc	• Tire maintenance occurs primarily within service bays, where pollutants are not exposed to storm water. If performed outdoors, the area is cleaned where needed following the activity. • Materials are prevented from tracking outside of service bays through prompt spill cleanup, regular sweeping and/or mopping of service bay floors and aprons. • Outdoor work areas discharge to an inlet insert and vegetated swale to remove residual pollutants prior to discharge off-site.	SC-43 SC-44 TC-30 MP-52	Broom; Mop

Industrial Activity	Pollutant Sources	Potential Pollutants	BMPs Implemented	CASQA BMP Fact Sheet Number(s)	Required Equipment and Tools
Bus Washing	Wash water	Detergents Cadmium Copper Lead Nickel Zinc Oil & Grease	• Bus wash water is contained on the concrete pad where washing occurs. • All wash water is collected following washing activities and disposed of to the sanitary sewer. • Outdoor work areas discharge to an inlet insert and vegetated swale to remove residual pollutants prior to discharge off-site.	SC-10 SC-11 SC-21 TC-30 MP-52	Wet/dry vacuum; Mop

Section 4 BMP Implementation

4.1 BMP IMPLEMENTATION SCHEDULE

The schedule for implementing all minimum and advanced BMPs is presented in Table 4.1. BMPs will be implemented as necessary to reduce or prevent transport of industrial pollutants in storm water runoff. Slight modifications to this schedule may be necessary to achieve this goal.

Table 4.1 BMP Implementation Schedule

Industrial Activity and Location	BMP Description	Person Responsible for Implementing BMP(s)	Date and Time of Implementation	Implementation Duration
Engine Servicing	See Table 3.4	Staff Mechanic, Bus Drivers	Daily when activity is conducted	Throughout activity
Transmission Servicing	See Table 3.4	Staff Mechanic	Daily when activity is conducted	Throughout activity
Brake Maintenance	See Table 3.4	Staff Mechanic	Daily when activity is conducted	Throughout activity
Tire Maintenance	See Table 3.4	Staff Mechanic	Daily when activity is conducted	Throughout activity
Fluid Changes	See Table 3.4	Staff Mechanic	Daily when activity is conducted	Throughout activity
Bus Washing	See Table 3.4	Mobile Detailing Contractor	Daily when activity is conducted	Throughout activity

4.2 BMP INSPECTION AND MAINTENANCE

The General Permit requires, at a minimum, monthly observations of BMPs, along with inspections during sampling events. Monthly observations will be conducted during daylight hours of scheduled facility operating hours and on days without precipitation. A BMP observation checklist must be filled out for and maintained on-site with the SWPPP. The observation checklist includes the necessary information as discussed in Section 5.5. A blank observation checklist can be found in MIP Attachment 3, and completed checklists will be kept in MIP Attachment 2.

BMPs will be maintained regularly to ensure proper and effective functionality. If necessary, corrective actions will be implemented immediately where possible, with a goal of completion within 72 hours of identification of the deficiency. Any associated amendments to the SWPPP will be prepared and documented.

Specific guidance for maintenance, observation, and repair of advanced BMPs can be found in the BMP fact sheets in Appendix F.

Section 5 Monitoring Implementation Plan

5.1 PURPOSE

This MIP was developed to address the following objectives:

1. Identify the monitoring team;
2. Describe weather and rain event tracking procedures;
3. Describe discharge locations, visual observations procedures;
4. Describe visual observation response procedures;
5. Describe sample collection and handling procedures;
6. Describe field instrumentation calibration instructions and intervals;
7. Provide justification for alternative discharge locations, Representative Sample Reduction, and Qualified Combined Samples, as applicable; and
8. Provide an example Chain of Custody (CoC) form to be used when handling and shipping water quality samples to the laboratory.

5.2. WEATHER AND RAIN EVENT TRACKING

Storm water sampling and visual observations will be conducted during Qualifying Storm Events (QSEs). A QSE is defined as any precipitation event that produces a discharge for at least one drainage area and is preceded by 48 hours with no discharge from any drainage area. Weather and precipitation forecasts will be tracked to identify potential QSEs.

The following online resources may be used to track precipitation events:

http://www.srh.noaa.gov/

http://www.wunderground.com/

When targeting a QSE for storm water sampling, the appropriate team member or designated alternate will weekly consult the National Oceanographic and Atmospheric Administration for weather forecasts. If weekly forecasts indicate potential for significant precipitation, the weather forecast will be closely monitored during the 48 hours preceding the event. Weather reports with precipitation data will be saved digitally, or printed and maintained with the SWPPP in MIP Attachment 1 “Weather Reports” to document precipitation totals and antecedent conditions.

5.3 MONITORING LOCATIONS

Monitoring locations are shown on the Site Map in Appendix A. Monitoring locations are described in Section 5.6.

Whenever changes in facility operations might affect the appropriateness of sampling locations, the sampling locations will be revised accordingly. All such revisions will be implemented as soon as feasible and the SWPPP amended.

5.4 SAMPLE COLLECTION AND VISUAL OBSERVATION EXCEPTIONS

Safety practices for sample collection will be in accordance with the District's internal health and safety guidelines. A summary of the safety requirements that apply to sampling personnel is provided below.

- Sampling shall not be conducted in the event that electrical storms, rapid waters, high winds, or other dangerous weather conditions pose an immediate threat to the safety of sampling personnel;
- Gloves shall be worn at all times when obtaining a water sample, and when handling sample bottles, both when empty and when full; and
- Precaution shall be taken before, during, and after a sampling event to prevent slipping on wet surfaces, which may include wearing slip-resistant footwear.

The collection of samples or conducting visual observations are not required under the following conditions:

- During dangerous weather conditions.
- Outside of scheduled site business hours.

Scheduled site business hours are presented in Section 2.2.

If monitoring, including visual observations and/or sample collection, of the facility is unsafe because of the dangerous conditions noted above then the appropriate team member will document the conditions for why an exception to performing the monitoring was necessary. The exception documentation will be filed in MIP Attachment 2, "Monitoring Records".

5.5 VISUAL OBSERVATION PROCEDURES

Visual monitoring includes observations of drainage areas, BMPs, and discharge locations.

- Observations 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.
- Observations of the drainage areas are required to identify any spills, leaks, uncontrolled pollutant sources, and NSWDs.
- Observations of discharge locations are required to identify the presence of visible pollutants in storm water discharged from the facility.

Visual observations will be performed at least once every calendar month during dry conditions. Visual observations will also be performed during storm water sampling events when discharge is occurring.

5.5.1 Monthly Visual Observations

Monthly visual observations are necessary to document the presence, and identify the source, of any pollutants and non-storm water flows. These should consist of observations of the outdoor facility operations, BMPs, and NSWD observations.

In the event that monthly visual observations are not performed, an explanation shall be recorded by the responsible team member, and reported in the annual report.

5.5.1.1 Outdoor Facility Operations Observations

Observe potential sources of industrial pollutants including industrial equipment and storage areas, and outdoor industrial activities. Record observations of:

- Spills or leaks; and
- Uncontrolled pollutant sources.

5.5.1.2 BMP Observations

Observe BMPs to identify and record:

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

5.5.1.3 NSWD Observations

Observe each drainage area for the presence of or indications of prior unauthorized and authorized NSWDs. Record:

- Presence or evidence of any NSWD (authorized or unauthorized);
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

5.5.2 Sampling Event Visual Observations

Sampling event visual observations evaluate the general appearance of the storm water as an indicator of potential pollutants. These observations will be conducted at the same time sampling occurs at the discharge locations identified in Section 5.6.2. At each discharge location where a sample is obtained, record observations of:

- Floating and suspended materials;
- Oil and grease;
- Discoloration;
- Turbidity;
- Odors; and
- Trash.

When pollutants are observed in the discharged storm water, follow-up observations of the drainage area will be conducted to identify the probable source of the pollutants.

In the event that a discharge location is not visually observed during the sampling event, the location of the discharge and reasoning for not obtaining observations must be recorded.

5.5.3 Visual Monitoring Procedures

Visual monitoring will be conducted by trained team members. The names of the site visual monitoring personnel are listed below, and their training qualifications are provided in Appendix C.

- Primary: Jennifer Nerat, Business Manager
- Alternate: Terri Thompson, Transportation Supervisor

Visual observations will be documented on the *Visual Observation Log* (see MIP Attachment 3 "Example Forms"). Visual observations will be supplemented with a site-specific BMP inspection checklist. Photographs used to document observations will be referenced on the *Visual Observation Log* and maintained with the Monitoring Records in Attachment 2.

The completed logs and checklists will be kept in MIP Attachment 2 "Monitoring Records".

5.5.4 Visual Monitoring Follow-Up and Reporting

Correction of deficiencies identified by the observations, including required repairs or maintenance of BMPs, will be initiated and completed as soon as possible. Response actions will include the following:

- Report observations to the Pollution Prevention Team Leader or designated individual;
- Identify and implement appropriate response actions;
- Determine if SWPPP update is needed;
- Verify completion of response actions; and
- Document response actions.

If identified deficiencies require design changes, including additional BMPs, the implementation of changes will completed as soon as possible, and the SWPPP will be amended to reflect the changes.

BMP deficiencies identified in site observation reports and correction of deficiencies will be tracked on the *BMP Observation Checklist* and will be retained in MIP Attachment 3 "Example Forms". Results of visual monitoring must be summarized and reported in the Annual Report.

5.5.5 Visual Monitoring Locations

The observations identified in Sections 5.5.1 and 5.5.2 will be conducted at the locations identified in this section. There are is one drainage area (A) in which all exposed industrial activities occur. This area drains to discharge point 001, which is included as a monitoring location, as shown on the Site Map in Appendix A, and identified in Table 5.1.

Table 5.1 Visual Monitoring Locations

Drainage Area	Discharge Location	Visual Monitoring Location Description
A	001	Discharge point 001 is located downstream of the outdoor concrete pad, after runoff has passed through an inlet insert and vegetated swale located in front of the westernmost administration building.

5.6 SAMPLING AND ANALYSIS PROCEDURES

This section describes the methods and procedures that will be followed for storm water sampling and analysis. It contains information for sampling schedule, sampling locations, monitoring preparation, analytical constituents, sample collection, sample analysis, and data evaluation and reporting.

5.6.1 Sampling Schedule

Pursuant to General Permit requirements for Compliance Group Participants, storm water samples at each discharge location will be collected and analyzed from one (1) QSE within the first half of each reporting year (July 1 to December 31), and one (1) QSE within the second half of each reporting year (January 1 to June 30).

A QSE is a precipitation event that:

- Produces a discharge for at least one drainage area; and
- Is preceded by 48 hours with no discharge from any drainage area.

5.6.2 Sampling Locations

Sampling locations include all locations where storm water is discharged from industrial drainage areas. Discharge locations are shown on the Site Map in Appendix A, and are described in Table 5.2.

A total of one discharge location has been identified on the site for the collection of storm water runoff samples.

Table 5.2 Sample Locations

Sample Location Number	**Sample Location Description**	**Sample Location Latitude and Longitude** (Decimal Degrees)
001	Discharge point 001 is located downstream of the outdoor concrete pad, after runoff has passed through an inlet insert and vegetated swale located in front of the westernmost administration building.	32.836729, -116.775081

5.6.3 Monitoring Preparation

Samples on the project site will be collected by the following sampling personnel:

- Primary: Jennifer Nerat, Business Manager
- Alternate: Terri Thompson, Transportation Supervisor

An adequate stock of monitoring supplies and equipment for sampling will be available onsite prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the Alpine Union School District bus maintenance facility will include, but are not limited to: clean powder-free nitrile gloves; sample collection equipment; coolers; appropriate number and volume of sample containers; identification labels; re-sealing storage bags; paper towels; personal rain gear; and *Sampling Field Log Sheets* and CoC forms, which are

provided in MIP Attachment 3 "Example Forms". Ice will be obtained prior to sample collection, either onsite or at an outside retailer.

5.6.4 Analytical Constituents

Table 5.3 lists the constituents identified for sampling and analysis.

Table 5.3 Analytical Constituents

Constituent	Reason
pH	Basic required constituent
Oil and grease	Basic required constituent
Total Suspended Solids	Basic required constituent
Cadmium	Pollutant Source Assessment constituent
Copper	Pollutant Source Assessment constituent
Lead	Pollutant Source Assessment constituent
Nickel	Pollutant Source Assessment constituent
Zinc	Pollutant Source Assessment constituent
Methylene Blue Active Substances	Pollutant Source Assessment constituent

5.6.5 Sample Collection

Samples of discharge will be collected at the designated sampling locations shown on the Site Map in Appendix A. Samples from each discharge location will be collected within four (4) hours of:

- The start of the discharge; or
- The start of bus maintenance facility operations, if the QSE begins within the previous 12 hour period.

Sample collection is required during scheduled bus maintenance facility operating hours and when sampling conditions are safe.

Grab samples will be collected and preserved in accordance with the methods identified in Table 5.4, "Sample Collection, Preservation and Analysis for Water Quality Samples" provided in Section 5.6.6. Only team members properly trained in water quality sampling will collect samples.

The bus maintenance facility is not subject to Subchapter N Effluent Limitation Guidelines and New Performance Standards mandating pH analysis, and has not entered Level 1 Status for pH. Grab samples will be collected and analyzed for pH using wide range litmus paper. The pH analysis will be performed as soon as practicable, but no later than 15 minutes after sample collection.

Samples from different discharge locations will not be combined or composited prior to shipment to the analytical laboratory. Sample collection and handling requirements are described in Section 5.8.

5.6.6 Sample Analysis

Samples will be analyzed using the analytical methods identified in the Table 5.4.

Samples will be analyzed by:

Enviromatrix Analytical
4340 Viewridge Avenue,
San Diego, CA 92123
(858) 560-7717

Point of Contact: Jennifer Beyer
Environmental Laboratory Accreditation Program Certification Number: 2564

Samples will be delivered to the laboratory by facility personnel.

Table 5.4 Sample Collection, Preservation and Analysis for Water Quality Samples

Constituent	Analytical Method	Sample Location(s)	Minimum Sample Volume	Sample Containers	Sample Preservation	Reporting Limit	Maximum Holding Time
pH	Litmus paper	001	N/A	N/A	N/A	0-14	15 minutes
Total Suspended Solids	SM 2540-D	001	100 ml	1- 250 ml polycarbonate	Unpreserved	20 mg/L	7 days
Oil and Grease	EPA 1664A	001	1 L	1- 1 L Amber glass jar	HCl to pH < 2	5 mg/L	28 days
Cadmium, Total	EPA 200.8	001	500 ml	1- 500 ml polycarbonate	HNO3 to pH < 2	0.001 mg/L	6 months
Copper, Total	EPA 200.8	001	500 ml	1- 500 ml polycarbonate	HNO3 to pH < 2	0.033 mg/L	6 months
Lead, Total	EPA 200.8	001	500 ml	1- 500 ml polycarbonate	HNO3 to pH < 2	0.016 mg/L	6 months
Nickel, Total	EPA 200.8	001	500 ml	1- 500 ml polycarbonate	HNO3 to pH < 2	0.007 mg/L	6 months
Zinc, Total	EPA 200.8	001	500 ml	1- 500 ml polycarbonate	HNO3 to pH < 2	0.456 mg/L	6 months
Methylene Blue Active Substances	5540 C-2000	001	200 ml	1- 250 ml polycarbonate	Unpreserved	0.5 mg/L	48 hours

Notes: ml = milliliter; mg = milligram; L = Liter; µg = microgram

5.6.7 Data Evaluation and Reporting

The designated member of the Pollution Prevention Team will complete an evaluation of the water quality sample analytical results.

All sampling and analytical results for all individual samples will be submitted via SMARTS within 30 days of obtaining all results for each sampling event.

The method detection limit will be provided when an analytical result from samples taken is reported by the laboratory as a “non-detect" or less than the method detection limit. A value of zero will not be reported.

Analytical results that are reported by the laboratory as below the minimum level (often referred to as the reporting limit) but above the method detection limit will be provided.

Reported analytical results will be averaged automatically by SMARTS at the end of the reporting year. For any calculations required by the General Permit, a value of zero shall be used for all effluent sampling analytical results that are reported by the laboratory as “non-detect" or less than the Method Detection Limit.

5.7 TRAINING OF SAMPLING PERSONNEL

Sampling personnel will be trained to collect, maintain, and ship samples in accordance with the General Permit and this SWPPP. Training records of designated sampling personnel are provided in Appendix C.

The primary and alternate storm water sampler receive storm water sampling training annually during the training session performed by the CGL.

5.8 SAMPLE COLLECTION AND HANDLING

5.8.1 Sample Collection

Samples will be collected at the designated monitoring locations shown on the Site Map and listed in the preceding sections. Samples will be collected, maintained and shipped in accordance with the requirements in the following sections.

Grab samples will be collected and preserved in accordance with the methods identified in preceding sections.

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

- Collect samples (for laboratory analysis) only in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sample collection sites;
- Utilize uncontaminated sample bottles that are free of preservatives as the sample collection container;
- 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 stream 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.
- Avoid collecting samples from ponded, sluggish or stagnant water.
- Do not stand upstream of the sampling point within the flow path.

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 a clean collection container.

5.8.2 Sample Handling

Field pH measurements must be conducted immediately using litmus paper, by placing a new, dry strip of litmus paper directly into the flow path, and immediately evaluating the color of the moistened strip against the comparator scale on the litmus paper case. Do not store 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 containers in a re-sealable storage bag;
- Place sample containers into an ice-chilled cooler;
- Document sample information on the Visual Observation Log for Sampling Events; and
- Complete the CoC.

All samples for laboratory analysis must be maintained between 0-6 degrees Celsius during delivery to the laboratory. Samples must be kept on ice from sample collection through delivery to the laboratory. Place samples inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage during transport, and secure cooler lids.

Transport 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 General Permit requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory).

5.8.3 Sample Documentation Procedures

All original data documented on sample bottle identification labels, *Sampling Log*, and CoCs will be recorded using waterproof ink. If an error is made on a document, sampling personnel

will make corrections by lining through the error and entering the correct information. The erroneous information will not be obliterated. All corrections will be initialed and dated.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel will attach an identification label to each sample bottle. Sample identification will uniquely identify each sample location.

Field Log Sheets: Sampling personnel will complete the *Effluent Sampling Field Log Sheet* and *Receiving Water Sampling Field Log Sheet* for each sampling event, as appropriate.

Chain of Custody: Sampling personnel will complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the samples are turned over to the testing laboratory or courier.

5.9 QUALITY ASSURANCE AND QUALITY CONTROL

An effective Quality Assurance and Quality Control (QA/QC) plan will be implemented as part of the MIP 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;
- QA/QC Samples; and
- Data verification.

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

5.9.1 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, and sample point identification numbers. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH should also be recorded in the field log. Observations are recorded on the Visual Observation Log for Sampling Events, included in MIP Attachment 3 “Example Forms”.

5.9.2 Clean Sampling Techniques

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 5.8, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

5.9.3 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; and

- 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 MIP Attachment 3 "Example Forms".

5.9.4 Data Verification

After results are received from the analytical laboratory, the discharger will verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification will include:

- 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 to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- 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. 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.
  The U.S. EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. 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 pH measurements and visual observations must be verified as soon as the Visual Observation and Sampling Logs are received, typically at the end of the monitoring event. Field data verification will include:

- Check 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 logs; and

- Review notations of any errors and actions taken to correct the equipment or recording errors.

5.10 RECORDS RETENTION

Records of storm water monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least five (5) years from date of submittal or longer if required by the Regional Water Board.

Results of visual observations, field measurements, and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

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;
- Weather reports;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exception records; and
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

MIP Attachment 1: Weather Reports

MIP Attachment 2: Monitoring Records

MIP Attachment 3: Example Forms

Visual Observation Log – Sampling Event
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____

Inspector Name: _____ Signature: _____

Weather

Confirm Qualifying Storm Event (QSE):

☐ No precipitation in the 48 hours prior to start of current storm

☐ Current storm began within the prior 12 hours.

Date and time storm began: ____/____/_____ ____:____ AM / PM *(circle one)*

☐ It is within the first 4 hours of the start of runoff or the start of operational hours

Sampling Event Observations

Discharge Point 001 Sample Time: ____:____ AM / PM *(circle one)*

Floating Material	☐ No	☐ Yes
Suspended Material	☐ No	☐ Yes
Oil/Grease Sheen	☐ No	☐ Yes
Discolorations	☐ No	☐ Yes
Turbidity	☐ No	☐ Yes
Odors	☐ No	☐ Yes
Trash/Debris	☐ No	☐ Yes
Other:_____	☐ No	☐ Yes

Record pH: _____

If "Yes" for any materials observed, or pH is less than 6 or more than 9, identify location, probable source, and action taken:

Exception Documentation (explanation required if observation could not be conducted).

Visual Observation Log – Monthly (July)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (July)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (August)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (August)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (September)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (September)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (October)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (October)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (November)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (November)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (December)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (December)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (January)
Alpine Union School District Bus Maintenance Facility
1323 Administration Way Alpine, CA 91901**Alpine Union School District**

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (January)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (February)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (February)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
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Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (March)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (March)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (April)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (April)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
Site free of spills and leaks				
Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (May)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (May)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
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Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

Visual Observation Log – Monthly (June)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Observation: ____/____/_____ Time: ____:____ AM / PM *(circle one)*	
Inspector Name: _____ Signature: _____	
Weather	
Antecedent Conditions (last 48 hours): No precipitation	Current Weather: No precipitation
NSWD Observations	
Were any authorized non-storm water discharges observed? N/A	
Were any **unauthorized** non-storm water discharges (or evidence of) observed? ☐ Yes ☐ No	
If yes to either, identify source:_____	
Outdoor Industrial Equipment and Storage Area Observations	
Monthly BMP Inspection Report Completed: ☐ Yes ☐ No	
Drainage Area A:	Were any deficiencies or potential sources of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area B:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
Drainage Area C:	Were any deficiencies or potential source of industrial pollutants observed? ☐ Yes ☐ No
If yes to any of the above, describe deficiency/pollutant source, and resulting actions:	
Exception Documentation (explanation required if inspection could not be conducted).	

BMP Inspection Report– Monthly (June)
Alpine Union School District Bus Maintenance Facility

1323 Administration Way Alpine, CA 91901

Date of Inspection: ____/____/_____ Time: ____:____ AM / PM *(circle one)*

Inspector Name: _____ Signature: _____

BMP Observations

BMPs	N/A	Adequate	Not Adequate	Comments *(note any deficiency and action taken)*
Good Housekeeping				
Site free of trash, debris, and accumulated sediment				
Paved areas free of materials tracked from industrial areas				
Dust-generating activities conducted in contained area(s)				
Discharge points free of trash, debris, & sediment				
Discharge points free of non-storm water discharges, or evidence thereof				
Wash water disposal procedures implemented				
Preventative Maintenance				
Bus maintenance and inspection schedules implemented				
Fuel hoses inspected every business day				
Hydraulic lift hoses and systems inspected prior to use				
Spill and Leak Prevention and Response				
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Drip pans in use where needed				
Spill kit materials stocked and located near areas where spills may occur				
Material Handling and Waste Management				
Waste receptacles covered				
Cover provided for stored materials or equipment				
Liquid storage within intact containment				
Erosion and Sediment Controls				
Entrances/Exits/Perimeter of site stabilized				
Erosion control applications (e.g. fiber rolls, sandbags) are intact and in place				
Training , Quality Assurance, and Record Keeping				
Employee training up to date and documented				
Facility records up to date				
Other:				

CHAIN-OF-CUSTODY RECORD

– EnviroMatrix Analytical, Inc. ——

4340 Viewridge Ave., Ste. A - San Diego, CA 92123 - Phone (858) 560-7717 - Fax (858) 560-7763

EMA LOG #:

Client:

Attn:

Samplers(s):

Address:

Phone: Fax:

Email:

Billing Address:

Project ID:

Project #: PO #:

Requested Analysis

ID #	Client Sample ID	Sample Date	Sample Time	Sample Matrix	Container # / Type	Oil & Grease □ 413.1 □ 413.2 □ 1664	8015 (TPH) □ Gas □ Diesel □ Ext	624/8260 (VOC) Full BTXE MTBE Oxy Nap	625 / 8270 (SVOC) □ PAH only	608 / 8081 (Organochlorine Pesticides)	608 / 8082 (Polychlorinated Biphenyls)	8141 (Organophosphorus Pesticides)	TBT (Organotin Compounds)	□ pH □ EC □ TSS □ TDS	□ Nitrate □ Nitrite □ TKN □ NH3	CAC Title 22/CAM17 Metals □ TTLC □ STLC	TCLP (RCRA) □ Metals □ Organics	Cd Cr Cu Pb Ni Ag Zn □ Dissolved	Coliform, □ Total (MTF) □ Fecal (MTF)	Colilert, T+E.Coli □ P/A □ Enumeration	Enterococcus, □ MTF □ Enterolert	Heterotrophic Plate Count (HPC)	□ BOD □ COD □ Cyanide					
1																												
2																												
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												

Matrix Codes: A = Air, DW = Drinking Water, GW = Groundwater, SW = Storm Water
WW = Wastewater, S = Soil, SED = Sediment, SD = Solid, T = Tissue, O = Oil, L = Liquid

Shipped By: □ Courier □ UPS □ FedEx □ USPS □ Client Drop Off □ Other

[1]**Turn-Around-Time:** □ Same Day □ 1 day □ 2 day □ 3 day □ 4 day □ 5 day □ STD (7 day)

[1]**Reporting Requirements:** □ Fax □ PDF □ Excel □ Geotracker/EDF □ Hard Copy □ EDT

[2]**Sample Disposal:** □ By Laboratory □ [3]Return to Client: P/U or Delivery □ Archive

Sample Integrity

Correct Containers: Yes No N/A | Containers Properly Preseved: Yes No N/A

Custody Seals Intact: Yes No N/A | Temp @ Receipt:_____

COC/Labels Agree: Yes No N/A | Sampled By: Client EMA Autosampler

RELINQUISHED BY	DATE/TIME	RECEIVED BY
Signature		Signature
Print		Print
Company:		Company:
Signature		Signature
Print		Print
Company:		Company:
Signature		Signature
Print		Print
Company:		Company:

Project/Sample Comments:

[1]Additional costs may apply. Please note there is a $35 minimum charge for all clients.

[2]EMA reserves the right to return any samples that do not match our waste profile.

NOTE: By relinquishing samples to EMA, Inc., client agrees to pay for the services requested on this COC form and any additional analyses performed on this project. Payment for services is due within 30 days from date of invoice. Samples will be disposed of 7 days after report has been finalized unless otherwise noted. All work is subject to EMA's terms and conditions.

MIP Attachment 4: Other Regulatory Documents

Section 6 References

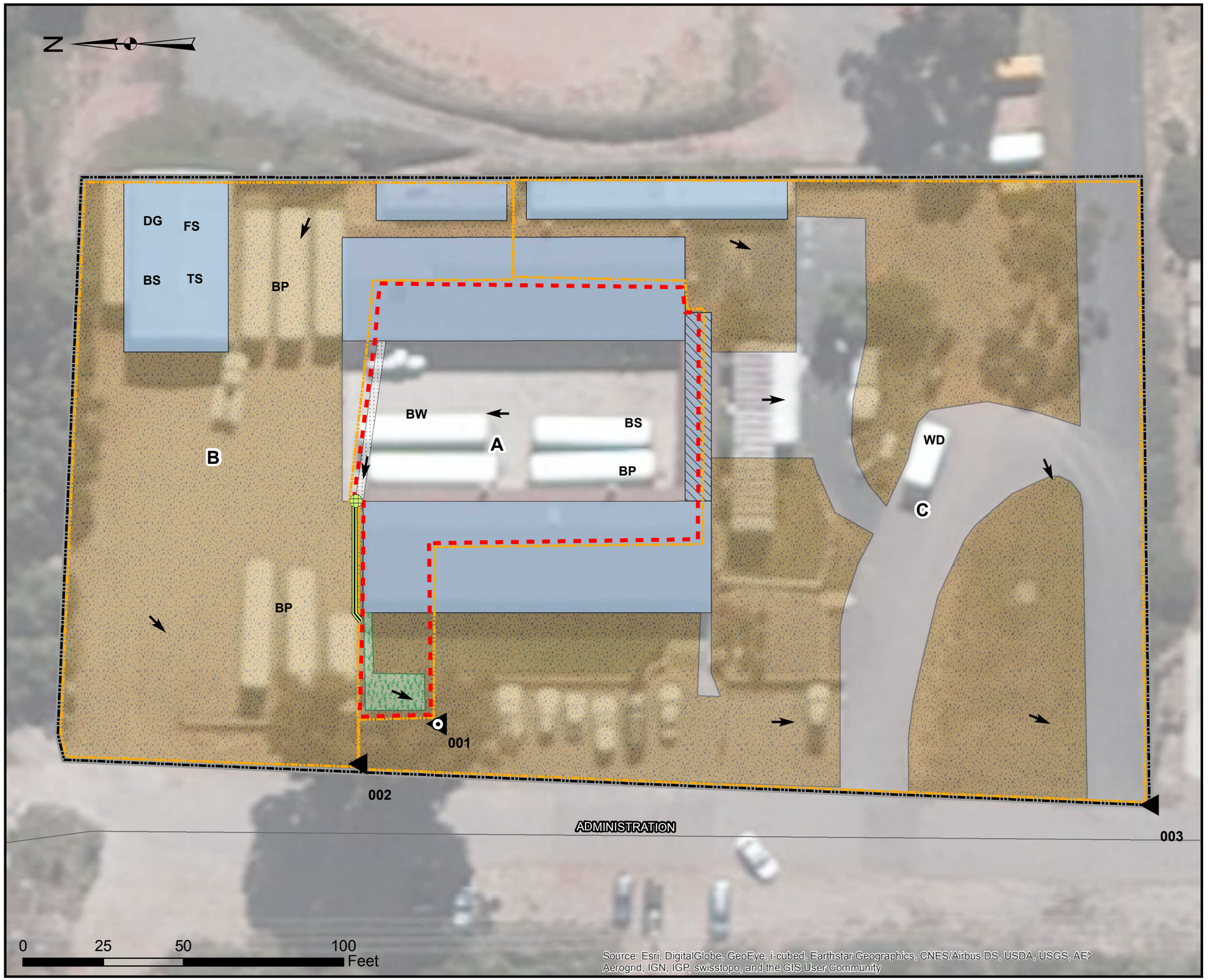
State Water Resources Control Board, 2014. State Water Resources Control Board Order No. 2014-0057-DWQ; National Pollutant Discharges Elimination System (NPDES) Order No. CAS000001: *NPDES General Permit for Storm Water Discharge Associated with Industrial Activities.* Available on-line at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.shtml.

CASQA, 2014, *Stormwater Best Management Practice Handbook Portal: Industrial Commercial*, August 2014, www.casqa.org

Appendix A: Site Map

ALPINE UNION SCHOOL DISTRICT

SCHOOL BUS MAINTENANCE FACILITY
SITE MAP



Legend

- Facility Boundary
- Industrial Drainage Area
- Non-Industrial Drainage Area
- Enclosed Building/Structure
- Covered Structure
- Pervious Area
- Open Swale
- Vegetated Swale
- Direction of Flow
- Monitoring Location
- Discharge Point
- Storm Drain Inlet
- Storm Drain Conveyance Pipe
- Roads

BP	Bus Parking
BS	Bus Servicing
BW	Bus Washing
DG	Dust Generating Area
FS	Fluid Storage
TS	Tire Storage
WD	Waste Dumpster

NOTE: All areas within the facility boundary are impervious, unless otherwise indicated.

DMAX ENGINEERING, INC.

Reference Scale: 1:350
Date: 6/8/2015
Drawn By: KLH
Checked By: AMK

Appendix A

Appendix B: Permit Registration Documents

Permit Registration Documents included in this Appendix

Y/N	Permit Registration Document
Yes	Notice of Intent
Yes	Certification
Yes	Copy of Annual Fee Receipt
Yes	Site Map, see Appendix A

Appendix C: Training Report Form

Trained Team Member Log

Storm Water Management Training Log and Documentation

Alpine Union School District

Storm Water Management Topic: (check as appropriate)

- ☐ Good Housekeeping
- ☐ Spill and Leak Prevention and Response
- ☐ Erosion and Sediment Controls
- ☐ Advanced BMPs
- ☐ Storm Water Sampling and Analysis
- ☐ Preventative Maintenance
- ☐ Material Handling and Waste Management
- ☐ Quality Assurance and Record Keeping
- ☐ Visual Monitoring

Specific Training Objective: _____

Location: _____ Date: ____/____/_____

Instructor Name:_____ Signature: _____

Course Length (hours): _____

Attendee Roster (Attach additional forms if necessary)

Name, title	Signature

As needed, add proof of external training (e.g., course completion certificates, credentials).

Appendix D: Responsible Parties

Authorization of Duly Authorized Representatives

Alpine Union School District

WDID: 9 37I018141

Name of Personnel	Project Role	Company	Signature	Date

Jennifer Nerat,

Legally Responsible Person

Date

Identification of QISP

Alpine Union School District

WDID: 9 37I018141

The following QISP has been designated for this facility:

Annika Kubischta, CPSWQ

D-Max Engineering, Inc.
7220 Trade St. Ste.119
San Diego, CA 92121

QISP Certification Number: 063
Certification Date: July 1, 2015

Certified Professional in Storm Water Quality, #0934
Certification Date: May 13, 2013

The following California Licensed Professional Engineer will be consulted as needed for certain aspects of any Technical Reports that may be necessary to comply with the General Permit:

Arsalan Dadkhah, Ph.D., PE, QSD/QSP, QISP

D-Max Engineering, Inc.
7220 Trade St. Ste.119
San Diego, CA 92121

QISP Certification Number: 025
Certification Date: July 1, 2015

Appendix E: SWPPP Amendment Certifications

SWPPP Amendment No. ____

Alpine Union School District

WDID: 9 37I018141

Legally Responsible Person's Certification of the Storm Water Pollution Prevention Plan Amendment

"This Storm Water Pollution Prevention Plan and attachments were prepared under my direction to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities (State Water Resources Control Board Order No. 2014-0057-DWQ; NPDES Order No. CAS000001)."

Jennifer Nerat,	Date
Legally Responsible Person	

Appendix F:CASQA Stormwater BMP Handbook Portal: Industrial and Commercial Fact Sheets

Non-Stormwater Discharges SC-10

Description

Non-stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include: potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, emergency firefighting, etc. as discussed in Section 2.

However there are certain non-stormwater discharges that pose an environmental concern. These discharges may originate from illegal dumping of industrial material or wastes and illegal connections such as internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (examples of which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains.

Non-stormwater discharges will need to be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

pollutants on streets and into the storm drain system and downstream water bodies.

Approach

Initially the Discharger must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is the elimination of unauthorized non-stormwater discharges. See other BMP Fact Sheets for activity-specific pollution prevention procedures.

General Pollution Prevention Protocols

- Implement waste management controls described in SC-34 Waste Handling and Disposal.

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled or demarcated next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.

- Manage and control sources of water such as hose bibs, faucets, wash racks, irrigation heads, etc. Identify hoses and faucets in the SWPPP, and post signage for appropriate use.

Non-Stormwater Discharge Investigation Protocols

Identifying the sources of non-stormwater discharges requires the Discharger to conduct an investigation of the facility at regular intervals. There are several categories of non-stormwater discharges:

- Visible, easily identifiable discharges, typically generated as surface runoff, such as uncontained surface runoff from vehicle or equipment washing; and

- Non-visible, (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating non-stormwater discharges will vary considerably, as discussed below:

Visible and identifiable discharges

- Conduct routine inspections of the facilities and of each major activity area and identify visible evidence of unauthorized non-stormwater discharges. This may include:

  - ✓ Visual observations of actual discharges occurring;

- ✓ Evidence of surface staining, discoloring etc. that indicates that discharges have occurred;
- ✓ Pools of water in low lying areas when a rain event has not occurred; and
- ✓ Discussions with operations personnel to understand practices that may lead to unauthorized discharges.

- ☐ If evidence of non-stormwater discharges is discovered:
  - ✓ Document the location and circumstances using Worksheets 5 and 6 (Section 2 of the manual), including digital photos;
  - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location); and
  - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge.
- ☐ Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge. Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the non-stormwater discharge.

Other Illegal Discharges (Non visible)

Illicit Connections

- ☐ Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- ☐ Isolate problem areas and plug illicit discharge points.
- ☐ Locate and evaluate discharges to the storm drain system.
- ☐ Visual Inspection and Inventory:
  - ✓ Inventory and inspect each discharge point during dry weather.
  - ✓ Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system.
  - ✓ Non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- ☐ A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.

- Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.

- Never assume storm drains are connected to the sanitary sewer system.

Monitoring for investigation/detection of illegal discharges

- If a suspected illegal or unknown discharge is detected, monitoring of the discharge may help identify the content and/or suggest the source. This may be done with a field screening analysis, flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and Appendix D describe the necessary field equipment and procedures for field investigations.

- Investigative monitoring may be conducted over time. For example if, a discharge is intermittent, then monitoring might be conducted to determine the timing of the discharge to determine the source.

- Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, then monitoring might be conducted at accessible upstream locations in order to pinpoint the source of the discharge.

- Generally, investigative monitoring requiring collection of samples and submittal for lab analysis requires proper planning and specially trained staff.

Smoke Testing

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- Smoke testing uses a harmless, non-toxic smoke cartridges developed specifically for this purpose.

- Smoke testing requires specialized equipment (e.g., cartridges, blowers) and is generally only appropriate for specially trained staff.

- A Standard Operating Procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:

  - ✓ Proper planning and notification of nearby residents and emergency services is necessary since introducing smoke into the system may result in false alarms;

  - ✓ During dry weather, the stormwater collection system is filled with smoke and then traced back to sources;

- ✓ Temporary isolation of segments of pipe using sand bags is often needed to force the smoke into leaking pipes; and

- ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet indicates that there may be a connection between the sanitary and storm water systems.

- Most municipal wastewater agencies will have necessary staff and equipment to conduct smoke testing and they should be contacted if cross connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

Dye Testing

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and there is evidence of dry weather flows in the stormwater collection system.

- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.

- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.

- Dye testing can be performed informally using commercially available products in order to conduct an initial investigation for fairly obvious cross-connections.

- More detailed dye testing should be performed by properly trained staff and follow SOPs. Specialized equipment such as fluorometers may be necessary to detect low concentrations of dye.

- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing and they should be contacted if cross connections with the sanitary sewer are suspected.

TV Inspection of Drainage System

- Closed Circuit Television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.

- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of pipes so the camera can take video images of the pipe condition.

- CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- CCTV can also be used to detect dye introduced into the sanitary sewer.
- CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. These wastes can cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ An anonymous tip/reporting mechanism; and
  - ✓ Evidence of responsible parties (e.g., tagging, encampments, etc.).
- One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Spill and Leak Prevention and Response

- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See SC-11 Spill Prevention Control and Cleanup.

Employee Training Program

- Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be presented in the SWPPP, and depends on site-specific industrial materials and activities.
- Consider posting a quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.
- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce possibility.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.

- Conduct spill response drills annually (if no events occurred) in order to evaluate the effectiveness of the plan.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Quality Assurance and Record Keeping

Performance Evaluation

- Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Develop document and data management procedures.
- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Annually document and report the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- Document training activities.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Many facilities do not have accurate, up-to-date 'as-built' plans or drawings which may be necessary in order to conduct non-stormwater discharge assessments.
  - ✓ Online tools such as Google Earth™ can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of non-stormwater discharges
  - ✓ Local municipal jurisdictions may have useful drainage systems maps.

- Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.
- Indoor floor drains may require re-plumbing if cross-connections are detected.
- Leaky sanitary sewers will require repair or replacement which can have significant costs depending on the size and industrial activity at the facility.

Maintenance (including administrative and staffing)

- The primary effort is for staff time and depends on how aggressively a program is implemented.
- Costs for containment, and disposal of any leak or discharge is borne by the Discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Permit Requirements

The IGP authorizes certain Non-Storm Water Discharges (NSWDs) provided BMPs are included in the SWPPP and implemented to:

- Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
- Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
- Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards (WQS); and,

- Reduce or prevent discharges of pollutants in authorized NSWDs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability."

References and Resources

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Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*, Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

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Southern California Coastal Water Research Project, 2013. *The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches,* Technical Report 804.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net/.

US EPA. National Pollutant Discharge Elimination System. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=111.

WEF Press Alexandria, Virginia, 2009.Existing Sewer Evaluation and Rehabilitation: *WEF Manual of Practice No. FD-6 ASCE/EWRI Manuals and Reports on Engineering Practice No. 62, Third Edition.*

Spill Prevention, Control & Cleanup SC-11

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental spills. Preparation for accidental spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify hazardous material storage areas, specify material handling procedures, describe spill response procedures, and provide locations of spill clean-up equipment and materials. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills. An adequate supply of spill clean-up materials must be maintained onsite.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

Approach

General Pollution Prevention Protocols

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems.
- ☐ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ Establish procedures and/or controls to minimize spills and leaks. The procedures should address:
  - ✓ Description of the facility, owner and address, activities, chemicals, and quantities present;

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- ✓ Facility map of the locations of industrial materials;
- ✓ Notification and evacuation procedures;
- ✓ Cleanup instructions;
- ✓ Identification of responsible departments; and
- ✓ Identify key spill response personnel.

- ☐ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Spill and Leak Prevention and Response

Spill Prevention

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- ☐ If illegal dumping is observed at the facility:

  - ✓ Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - ✓ Landscaping and beautification efforts may also discourage illegal dumping.
  - ✓ Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- ☐ Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- ☐ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

Preventative Maintenance

- ☐ Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.

- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

- ☐ Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

- ☐ Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- ☐ Label all containers according to their contents (e.g., solvent, gasoline).

- ☐ Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).

- ☐ Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).

- ☐ Identify key spill response personnel.

Spill Response

- ☐ Clean up leaks and spills immediately.

- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).

- ☐ On paved surfaces, clean up spills with as little water as possible.

  - ✓ Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills.

  - ✓ If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

  - ✓ If possible use physical methods for the cleanup of dry chemicals (e.g., brooms, shovels, sweepers, or vacuums).

- ☐ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.

- ☐ Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.

- ☐ For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board or local authority as location regulations dictate.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to 911 for dispatch and clean-up assistance when needed. Do not contact fire agencies directly.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ Clean-up procedures; and
  - ✓ Responsible parties.

Employee Training Program

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - ✓ The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur; and
  - ✓ Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- Develop spill prevention and control plan, provide and document training, conduct inspections of material storage areas, and supply spill kits.
- Extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident;
- Weather conditions;
- Duration of the spill/leak/discharge;

- Cause of the spill/leak/discharge;
- Response procedures implemented;
- Persons notified; and
- Environmental problems associated with the spill/leak/discharge.

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- Date and time the inspection was performed;
- Name of the inspector;
- Items inspected;
- Problems noted;
- Corrective action required; and
- Date corrective action was taken.

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems;
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- External corrosion and structural failure;
- Spills and overfills due to operator error; and
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.

- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use absorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:

  Cover fueling area if possible.

  Use a perimeter drain or slope pavement inward with drainage to a sump.

  Pave fueling area with concrete rather than asphalt.

- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off" of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities.

The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.

- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- Address spills at municipal facilities, as well as public areas.
- Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

References and Resources

California's Nonpoint Source Program Plan. http://www.swrcb.ca.gov/nps/index.html.

Clark County Storm Water Pollution Control Manual. Available online at: http://www.co.clark.wa.us/pubworks/bmpman.pdf.

King County Storm Water Pollution Control Manual. Available online at: http://dnr.metrokc.gov/wlr/dss/spcm.htm.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp.org.

The Stormwater Managers Resource Center. http://www.stormwatercenter.net/.

Vehicle and Equipment Cleaning SC-21

Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

General Pollution Prevention Protocols

- If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.
- Use dry cleaning methods to remove debris and sweep area; avoid washing with water when possible.
- Good housekeeping practices can minimize the risk of contamination from wash water discharges.
- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate
- Emphasize the connection between the storm drain system and runoff, help reinforce that vehicle and equipment washing activities affect local water quality through storm drain stenciling programs.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Addressed	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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Vehicle and Equipment Cleaning SC-21

- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Designate specific wash area with clarifier or place wash areas away from storm drain connections.

Good Housekeeping

- Mark the area clearly as a wash area by:
  - ✓ Posting signs stating that only washing is allowed in wash area; and
  - ✓ Providing information on how washing is to be done.
- Provide trash containers in wash area.
- Have all vehicle and equipment washing done in areas designed to collect and hold the wash and rinse water or effluent generated. Recycle, collect or treat wash water effluent prior to discharge to the sanitary sewer system.
- If washing/cleaning must occur on-site, consider washing vehicles and equipment inside the building or on an impervious surface to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
  - ✓ Use designated paved wash areas. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
  - ✓ Do not conduct oil changes and other engine maintenance in the designated washing area. Perform these activities in a place designated for oil change and maintenance activities.
  - ✓ Cover the wash area when not in use to prevent contact with rain water.
- Do not permit steam cleaning wash water to enter the storm drain system.
- If possible, conduct pressure and steam cleaning at appropriate off-site areas to avoid generating runoff with high pollutant concentrations.

Preventative Maintenance

- Install sumps or drain lines to collect wash water for treatment.
- Use hoses with nozzles that automatically turn off when left unattended.
- Perform routine inspections of drain lines, holding tanks, and hoses and repair leaks immediately.

- Perform routine inspection and maintenance of wash water recycling and treatment systems.

Spill Response and Prevention Procedures

- Keep the spill prevention and control plan up-to-date.
- Have an emergency plan, equipment, and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.

Material Handling and Waste Management

- Collect all wash water from vehicle and equipment cleaning operations. Consider treating and reusing or discharging wash waters to a sanitary sewer system.
- Large quantities of wash waters may require treatment at the facility. Treatment using a process treatment system (e.g., holding tank, filtration system, and related appurtenances) will require engineering and capital expenditures.
- Collect and treat small amounts of wash water at the facility and either recycle or discharge to the sanitary sewer system or collect and dispose of as an industrial waste.
- Discharge wash waters into sanitary sewer only after contacting local sewer authority to find out if pretreatment is required.

Employee Training Program

- Train employees on proper cleaning and wash water disposal procedures and conduct “refresher” courses on a regular basis.
- Train staff on proper maintenance measures for the wash area.
- Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance/inspection logs that document the minimum BMP activities performed for vehicle and equipment cleaning activities and improvement actions.

- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

- Establish procedures to complete logs and file them in the central office.

Other Facility-Specific Considerations

- Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.

- Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to the condensate wastewater generated.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of certain BMPs. Provided below are typical limitations and recommended "work-arounds":

- Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive. Also, for facilities that cannot recycle their wash water, the cost of pre-treating wash water through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants can be cost-prohibitive.

- A potential work-around is to use properly maintained off-site commercial washing and steam cleaning businesses whenever possible.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Many facilities will already have indoor covered areas where vehicle and equipment cleaning takes place and will require no additional capital expenditures for providing cover.

- Capital investments will be required at some sites if systems to collect and recycle/treat and properly discharge wash water are not in place. The cost associated with these investments will vary depending on the size of the washing facility and local regulations regarding effluent wash water.

Maintenance

- Perform wash and collection system inspections and repair.

- Sweep washing areas frequently to remove solid debris.

- Repair berms and dikes as necessary.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

Supplemental Information

Designated Cleaning Areas

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
  - ✓ Paved with Portland cement concrete
  - ✓ Covered and bermed to prevent contact with stormwater and contain wash water
  - ✓ Sloped for wash water collections
  - ✓ Drainage system for wash water to the sanitary or recycle treatment process waste sewer, or to a dead-end sump equipped with an oil/water separator if necessary.

References and Resources

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

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Vehicle and Equipment Repair SC-22

Description

Vehicle or equipment maintenance and repair are potentially significant sources of stormwater pollution, due to use of harmful materials and wastes during maintenance and repair processes. Engine repair and service (e.g., parts cleaning), replacement of fluids (e.g., oil change), and outdoor equipment storage and parking (leaking vehicles) can impact water quality if stormwater runoff from areas with these activities becomes polluted by a variety of contaminants. Implementation of the following activities must be done where applicable to prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

Approach

The BMP approach is to reduce the potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives. General pollution prevention protocols are presented followed by applicable minimum BMPs as required by the Industrial General Permit.

General Pollution Prevention Protocols

- ☐ Designate a vehicle maintenance area designed to prevent stormwater pollution.
- ☐ Minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- ☐ Keep accurate maintenance logs to evaluate materials removed and improvements made.
- ☐ Switch to non-toxic chemicals for maintenance when possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Use drop cloths and drip pans.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Minimize use of solvents. Clean parts without using solvents whenever possible, or use water-based solvents for cleaning.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

Operational Protocols

General

- Move maintenance and repair activities indoors whenever feasible.
- Place curbs around the immediate boundaries of process equipment.

Good Housekeeping

- Store idle equipment under cover
- Use a vehicle maintenance area designed to prevent stormwater pollution - minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer. Use dry sweeping if possible.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Post signs at sinks to remind employees not to pour wastes down drains.
- Clean yard storm drain inlets(s) regularly and especially after large storms.
- Do not pour materials down storm drains.
- Cover the work area to limit exposure to rain.
- Place curbs around the immediate boundaries of process equipment.
- Build a shed or temporary roof over areas where parked cars await repair or salvage, especially wrecked vehicles. Build a roof over vehicles kept for parts.

Preventive Maintenance and Repair Activities

- Provide a designated area for vehicle maintenance.
- Inspect vehicles and equipment for leaks regularly and repair immediately.
- Make sure incoming vehicles are checked for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site without correcting the source of the leak and cleaning up any spill.
- Keep equipment clean; don't allow excessive build-up of oil and grease.

- Perform all vehicle fluid removal or changing inside or under cover if possible to prevent the run-on of stormwater and the runoff of spills.

- Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being conducted outside. Collected drips and spills must be disposed, reused, or recycled properly.

- It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.

- Establish standard procedures to prevent spillage/leakage of fluids including:

  - ✓ Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while working on it to keep splatters or drips off the shop floor.

  - ✓ Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.

  - ✓ Keep drip pans or containers under vehicles or equipment that may drip during repairs.

  - ✓ Do not change motor oil or perform equipment maintenance in non-appropriate areas.

- Drain oil and other fluids first if the vehicle or equipment is to be stored outdoors. Elevate and tarp stored vehicles and equipment.

- Monitor parked vehicles closely for leaks. Pans should be placed under any leaks to collect the fluids for proper disposal or recycling.

- Mechanics should clean vehicle parts without using liquid cleaners wherever possible to reduce waste.

- Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.

- Fifth-wheel bearings on trucks require routine lubrication. Typically chassis grease is applied to the fifth-wheel bearing at rates that result in grease dripping off of the bearing into the environment. To address this concern the following options are available:

  - ✓ Use specialized lubricants with good adhesion (e.g., stay in place) properties. Carefully follow manufacturer's label regarding the use of adhesive lubricant for

truck fifth-wheels. Typically this means applying no more than 8 oz. of grease. No visible extrusion of lubricant from the fifth-wheel bearing when truck and trailer are connected should be present.

- ✓ Use on-board truck or on-board trailer automatic lubrication systems. If these systems apply lube thinner than National Grease Lubrication Institute #2, equipment for collection of used lubricant is needed to prevent excess lubricant from dripping off the truck.
- ✓ Use plastic or Teflon plates instead of grease or other lubricants. Carefully follow manufacturer's instructions for installation and operation.

- ☐ Use one of the following for lubricating vehicle-trailer coupling:
  - ✓ Specialized adhesive lubricants;
  - ✓ Grease-free fifth wheel slip plates (e.g., plastic or Teflon coatings); and
  - ✓ On-Board automatic lubricating systems.

Spill and Leak Prevention and Response Procedures

- ☐ Keep your spill prevention and control plan up-to-date.
- ☐ Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- ☐ Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:
  - ✓ Clean spills with rags or other absorbent materials;
  - ✓ Sweep floor using dry absorbent material; and
  - ✓ Mop the floor.

  Mop water may be discharged to the sanitary sewer via a toilet or sink.
- ☐ Remove the adsorbent materials promptly and dispose of properly when using adsorbent materials on small spills.

Material Handling and Waste Management

- ☐ Designate a special area to drain and replace motor oil, coolant, and other fluids, where there are no connections to the storm drain or the sanitary sewer, and drips and spills can be easily cleaned up.
- ☐ Drain all fluids immediately from wrecked vehicles. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g., larger pans are needed to contain antifreeze, which may gush from some vehicles).

- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not put used or leftover cleaning solutions, solvents, and automotive fluids and in the sanitary sewer.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Place oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal since municipalities prohibit or discourage disposal of these items in solid waste facilities.
- Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters. Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater.
- Store cracked batteries in a non-leaking secondary container and dispose of properly at recycling or household hazardous waste facilities.

Employee Training Program

- Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- Employees should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
- Conduct annual training to ensure that employees are familiar with the facility's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business).
- Use a training log or similar method to document training.

Quality Assurance and Recordkeeping

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Establish procedures to collect and file maintenance logs in the central office.

Other Facility-Specific Considerations

Parts Cleaning

Vehicle and equipment maintenance facilities often must clean parts as a part of day-today operations. The following activities should be considered:

- Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- Steam cleaning and pressure washing may be used instead of solvent parts cleaning.
- Wastewater generated from steam cleaning must be discharged to an on-site oil water separator that is connected to a sanitary sewer or blind sump.
- Use non-caustic detergents instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC21 for more information on steam cleaning.

Potential Limitations and Work-Arounds

- Some facilities may have space constraints and time limitations that may preclude all work from being conducted indoors.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
- It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
  - ✓ Provide a designated area for afterhours deliveries.
  - ✓ Install spill kits.
- Drain pans (usually 1 ft. x 1 ft.) are generally too small to contain antifreeze
  - ✓ Purchase or fabricate large drip pans (3 ft. x 3 ft.) with sufficient volume to contain expected quantities of liquids based on equipment/vehicle specifications.
- Dry floor cleaning methods may not be sufficient for some spills.
  - ✓ Use three-step method instead.
- Identification of engine leaks may require some use of solvents.
  - ✓ Minimize the use of solvents and use drip pans to collect spills and leaks.
- Prices for recycled materials and fluids may be higher than those of non-recycled materials.

- Some facilities may be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance, or solvent equipment and solvent recycling.

Potential Facilities and Maintenance Requirements

Facilities Requirements

- For facilities that already have covered areas where maintenance takes place, have berms or other means to retain spills and leaks, and/ have other appropriate constructed systems for containment, there may not need to be any significant new capital investment. Capital costs will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance Requirements

- Most of the operations and maintenance activity associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore, significant additional operations and maintenance efforts are not likely to be required.

- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration. Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

- It is important to sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately. Do not hose down the area to a storm drain.

Supplemental Information

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane or methylene chloride. Many of these cleaners are harmful and must be disposed of as a hazardous waste. Cleaning without using liquid cleaners (e.g., wire brush) whenever possible reduces waste. Prevent spills and drips of solvents and cleansers to the shop floor. Do all liquid cleaning at a centralized station so the solvents and residues stay in one area. Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents.

- Clean parts without using liquid cleaners whenever possible to reduce waste.

- Prevent spills and drips of solvents and cleansers to the shop floor.

- Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.

- Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

Recycling

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

- Recycling is always preferable to disposal of unwanted materials.

- Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.

- Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries).

- Purchase recycled products to support the market for recycled materials.

Safer Alternatives

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

- Use non-caustic detergents instead of caustic cleaning for parts cleaning.

- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sewer.

- Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.

- Choose cleaning agents that can be recycled.

References and Resources

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 8 Vehicle, Pavement and Building Washing*. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

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Washington State Department of Ecology, 2012. *Vehicle and Equipment Washwater Discharges Best Management Practices Manual*. Publication no. WQ-R-95-056. Available online at: https://fortress.wa.gov/ecy/publications/publications/95056.pdf.

Outdoor Equipment Operations SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, and solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. The targeted constituents will vary for each site depending on the operation being performed.

Approach

Implement source control BMPs to limit exposure of outdoor equipment to direct precipitation and stormwater run-on. Refer to SC-22 Vehicle and Equipment Repair for additional information.

General Pollution Prevention Protocols

- ☐ Perform the activity during dry periods whenever possible.
- ☐ Install secondary containment measures where leaks and spills may occur.
- ☐ Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- ☐ Connect process equipment area to public sanitary sewer or facility wastewater treatment system when possible. Some jurisdictions require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Good Housekeeping

- ☐ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.

Objectives
■ Cover
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Cover the work area with a permanent roof if possible.
- Use drop cloths for sanding and painting operations.
- Use a vacuum for fine particle clean-up in pavement cracks and crevices.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention).
- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Use roll down or permanent walls when windy/breezy to prevent wind transport of particulates/pollutants.

Preventative Maintenance

- Design outdoor equipment areas to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump.
- Dry clean the work area regularly. Do not wash outdoor equipment with water if there is a direct connection to the storm drain.
- Pave area with concrete rather than asphalt.
- Inspect outdoor equipment regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.
- Inspect and clean, if necessary, storm drain inlets and catch basins within the outdoor equipment area before October 1 each year.

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.

Material Handling and Waste Management

- Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drain or sewer connections.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees on proper equipment operation and maintenance procedures.
- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Ensure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for outdoor equipment, types and quantities of materials removed and disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Providing cover over outdoor equipment may be impractical or cost-prohibitive.
  - ✓ Operate outdoor equipment only during periods of dry weather.
- Regular operations and time limitations may require outdoor activities during wet weather.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Allow time for work area clean-up after each shift.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
  - ✓ Design and install secondary containment and good housekeeping BMPs for outdoor equipment area.
- Storage sheds often must meet building and fire code requirements.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Many facilities will already have indoor covered areas where vehicle and equipment repairs take place and will require no additional capital expenditures.
- If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

References and Resources

Minnesota Pollution Control Agency. *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

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Waste Handling & Disposal SC-34

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Accomplish reduction in the amount of waste generated using the following source controls:
  - ✓ Production planning and sequencing;
  - ✓ Process or equipment modification;
  - ✓ Raw material substitution or elimination;
  - ✓ Loss prevention and housekeeping;
  - ✓ Waste segregation and separation; and
  - ✓ Close loop recycling.
- ☐ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- ☐ Recycle materials whenever possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Use the entire product before disposing of the container.
- To the extent possible, store wastes under cover or indoors after ensuring all safety concerns such as fire hazard and ventilation are addressed.
- Provide containers for each waste stream at each work station. Allow time after shift to clean area.

Good Housekeeping

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain. Clean in a designated wash area that drains to a clarifier.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- If possible, move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Preventative Maintenance

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.

- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, vacuuming, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Spill Response and Prevention Procedures

- Keep your spill prevention and plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - ✓ Vehicles equipped with baffles for liquid waste; and
  - ✓ Trucks with sealed gates and spill guards for solid waste.

Material Handling and Waste Management

Litter Control

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.

- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for waste handling and disposal, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and the types of waste handled. Significant capital costs may be associated with reducing wastes by modifying processes or implementing closed-loop recycling.
- Many facilities will already have indoor covered areas where waste materials will be stored and will require no additional capital expenditures for providing cover.
- If outdoor storage of wastes is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

References and Resources

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Contaminated or Erodible Areas SC-40

Description

Areas within an industrial site that are bare of vegetation or are subject to activities that promote the suppression of vegetation are often subject to erosion. In addition, they may or may not be contaminated from past or current activities. If the area is temporarily bare because of construction, see SC-42 Building Repair, Remodeling, and Construction. Sites with excessive erosion or the potential for excessive erosion should consider employing the soil erosion BMPs identified in the Construction BMP Handbook. Note that this fact sheet addresses soils that do not exceed hazardous waste criteria (see Title 22 California Code of Regulations for Hazardous Waste Criteria).

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

Implement erosion and sediment control BMPs to stabilize soils and reduce pollutant discharges from contaminated or erodible surfaces.

Erosion and Sediment Controls

- ☐ Preserve natural vegetation whenever possible. See also EC-2 Preservation of Existing Vegetation, in the Construction BMP Handbook.
- ☐ Analyze soil conditions.
- ☐ Remove contaminated soil and dispose of properly.
- ☐ Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and	
Material Handling & Waste Management	
Erosion and Sediment Controls	✓
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Utilize non-vegetative stabilization methods for areas prone to erosion 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. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Implement wind erosion control measures as necessary. See also WE-1 Wind Erosion Control, in the Construction BMP Handbook.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly install and maintain the erosion and sediment source control BMPs described above. Detailed information is provided in the Construction BMP Handbook.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate logs that document actions taken to maintain and improve the effectiveness of the erosion and sediment control BMPs described above.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Many facilities do not have contaminated or erodible areas and will require no additional capital expenditures.
- For sites with contaminated or erodible areas, purchase and installation of erosion and sediment controls will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting site operations on bare soils.

Maintenance

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

Supplemental Information

Stabilization of Erodible Areas

Preserving stabilized areas minimizes erosion potential, protects water quality, and provides aesthetic benefits. The most effective way to control erosion is to preserve existing vegetation. Preservation of natural vegetation provides a natural buffer zone and an opportunity for infiltration of stormwater and capture of pollutants in the soil matrix. This practice can be used as a permanent source control measure.

Vegetation preservation should be incorporated into the site. Preservation requires good site management to minimize operations on bare soils where vegetation exists. Proper maintenance is important to ensure healthy vegetation that can control erosion. Different species, soil types, and climatic conditions will require different maintenance activities such as mulching, fertilizing, liming, irrigation, pruning and weed and pest control.

The preferred approach is to leave as much native vegetation on-site as possible, thereby reducing or eliminating any erosion problem. However, assuming the site already has contaminated or erodible surface areas, there are four possible courses of action which can be taken:

- The area can be revegetated if it is not in use and therefore not subject to damage from site activities. In as much as the area is already devoid of vegetation, special measures are likely necessary. Lack of vegetation may be due to the lack of water and/or poor soils. The latter can perhaps be solved with fertilization, or the ground may simply be too compacted from prior use. Improving soil conditions may be sufficient to support the recovery of vegetation. Use process wastewater for irrigation if possible, and see the Construction BMP Handbook for further procedures on establishing vegetation.

- Watering trucks to prevent dust.

- Chemical stabilization can be used as an alternate method in areas where temporary seeding practices cannot be used because of season or climate. It can provide immediate, effective, and inexpensive erosion control. Application rates and procedures recommended by the manufacturer should be followed as closely as possible to prevent the products from forming ponds and creating large areas where moisture cannot penetrate the soil. See also EC-5, Soil Binders, in the Construction BMP Handbook for more information. Advantages of chemical stabilization include:

  - ✓ Applied easily to the surface;
  - ✓ Stabilizes areas effectively; and
  - ✓ Provides immediate protection to soils that are in danger of erosion.

- Contaminated soils should be cleaned up or removed. This requires determination of the level and extent of the contamination. Removal must comply with State and Federal regulations; permits must be acquired and fees paid.

- Non-vegetated stabilization methods are suitable for permanently protecting from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

  Examples of non-vegetative stabilization BMPs are provided below:

  - ✓ ***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 of the Construction BMP Handbook 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 months – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats of the Construction BMP Handbook.
  - ✓ ***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. References and Resources.

References and Resources

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Building & Grounds Maintenance SC-41

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.

Good Housekeeping

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.

- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.

- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.

- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Building & Grounds Maintenance SC-41

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Material Handling and Waste Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Employee Training Program

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.

Quality Assurance and Record Keeping

- Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

Maintenance

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

Supplemental Information

Fire Sprinkler Line Flushing

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

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Building Repair and Construction SC-42

Description

Site modifications are common, particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and minor construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

This fact sheet is intended to be used for minor repairs and construction. If major construction is required, the guidelines in the Construction BMP Handbook should be followed.

Approach

The BMP approach is to reduce potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- ☐ Avoid outdoor repairs and construction during periods of wet weather.
- ☐ Use safer alternative products to the maximum extent practicable. See also SC-35 Safer Alternative Products for more information.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	✓
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Buy recycled products to the maximum extent practicable.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Good Housekeeping

Repair & Remodeling

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep and vacuum the area regularly to remove sediments and small debris.
- Cover raw materials of particular concern that must be left outside, particularly during the rainy season. See also SC-33 Outdoor Storage of Raw Materials for more information.
- Use equipment and tools such as bag sanders to reduce accumulation of debris.
- Limit/prohibit work on windy days; implement roll-down walls or other measures to reduce wind transport of pollutants.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store liquid materials properly that are normally used in repair and remodeling such as paints and solvents. See also SC-31 Outdoor Liquid Container Storage for more information.
- Sweep out rain gutters or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed. See also SC-44 Drainage System Maintenance for more information.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100 percent effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose of the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Spill Response and Prevention Procedures

- Keep your spill prevention and control plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Material Handling and Waste Management

- Post “No Littering” signs and enforce anti-litter laws.

- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.
- Make sure that hazardous waste is collected, removed, and disposed of properly. See also SC-34, Waste Handling and Disposal for more information.

Sediment and Erosion Controls

- Limit disturbance to bare soils and preserve natural vegetation whenever possible. See also EC-2, Preservation of Existing Vegetation, in the Construction BMP Handbook.
- Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.
- Utilize non-vegetative stabilization methods for areas prone to erosion 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. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Refer to the supplemental information provided below for projects that involve more extensive soil disturbance activities.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly implement the source control BMPs described above. Detailed information for Sediment and Erosion Control BMPs is provided in the Construction BMP Handbook.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about pollutant source control responsibilities.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for building repair and construction, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more extensive requirements for larger projects that would disturb one or more acres of surface.
  - ✓ Refer to the companion "Construction Best Management Practice Handbook" which contains specific guidance and best management practices for larger-scale projects.

- Time constraints may require some outdoor repairs and construction during wet weather.
  - ✓ Require employees to understand and follow good housekeeping and spill and leak prevention BMPs.
  - ✓ Inspect sediment and erosion control BMPs daily during periods of wet weather and repair or improve BMP implementation as necessary.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
  - ✓ Minimize use of hazardous materials to the maximum extent practicable.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.
- Prices for recycled/safer alternative materials and fluids may be higher than those of conventional materials.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Limited capital investments may be required at some sites if adequate cover and containment facilities do not exist for construction materials and wastes.
- Purchase and installation of erosion and sediment controls, if needed will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting construction operations on bare soils.

Maintenance

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

Supplemental Information

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

Building Repair and Construction SC-42

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

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Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

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Parking Area Maintenance SC-43

Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- Keep accurate maintenance logs to evaluate BMP implementation.

Good Housekeeping

- Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- Post "No Littering" signs and enforce anti-litter laws.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.

Preventative Maintenance

Inspection

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

Surface Repair

- Check local ordinance for SUSMP/LID ordinance.
- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control during sweeping to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Employee Training Program

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.

Maintenance

- Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

Supplemental Information

Advanced BMPs

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual.*

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Drainage System Maintenance SC-44

Description

As a consequence of its function, the stormwater drainage facilities on site convey stormwater that may contain certain pollutants either to the offsite conveyance system that collects and transports urban runoff and stormwater, or directly to receiving waters. The protocols in this fact sheet are intended to reduce pollutants leaving the site to the offsite drainage infrastructure or to receiving waters through proper on-site conveyance system operation and maintenance. The targeted constituents will vary depending on site characteristics and operations.

Approach

Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.
- ☐ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

Good Housekeeping

Illicit Connections and Discharges

- ☐ Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

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

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

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- ✓ Identify evidence of spills such as paints, discoloring, odors, etc.
- ✓ Record locations of apparent illegal discharges/illicit connections.
- ✓ Track flows back to potential discharges and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- ✓ Eliminate the discharge once the origin of flow is established.

- ☐ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

Illegal Dumping

- ☐ Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- ☐ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills); and
  - ✓ Responsible parties.
- ☐ Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

Preventative Maintenance

Catch Basins/Inlet Structures

- ☐ Staff should regularly inspect facilities to ensure compliance with the following:
  - ✓ Immediate repair of any deterioration threatening structural integrity.
  - ✓ Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Prioritize storm drain inlets; clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Wildlife. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Army Corps of Engineers and USFWS.

Spill Response and Prevention Procedures

- Keep your spill prevention control plan up-to-date.

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - ✓ OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - ✓ OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
  - ✓ Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for drainage system maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Keep accurate logs of illicit connections, illicit discharges, and illegal dumping into the storm drain system including how wastes were cleaned up and disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Provided below are typical limitations and recommended "work-arounds" for drainage system maintenance:

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.

  - ✓ Perform all maintenance onsite and do not flush accumulated material downstream to private property or riparian habitats.

- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, and liquid/sediment disposal.

  - ✓ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

- Regulations may include adoption of substantial penalties for illegal dumping and disposal.

  - ✓ Do not dump illegal materials anywhere onsite.

  - ✓ Identify illicit connections, illicit discharge, and illegal dumping.

  - ✓ Cleanup spills immediately and properly dispose of wastes.

- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the sanitary sewer system.

  - ✓ Collect all materials and pollutants accumulated in drainage system and dispose of according to local regulations.

  - ✓ Install debris excluders in areas with a trash TMDL.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and characteristics of the drainage system. Significant capital costs may be associated with purchasing water trucks, vacuum trucks, and any other necessary cleaning equipment or improving the drainage infrastructure to reduce the potential .

- Developing and implementing a site specific drainage system maintenance plan will require additional capital if a similar program is not already in place.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Supplemental Information

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used if allowed or that fire hydrant line flushing coincide with storm sewer flushing.

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Vegetated Swale TC-30

General Description

Vegetated swales (also referred to as bioswales, biofiltration swales, or landscaped swales) are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, reduce flow velocity, and increase time of concentration of stormwater runoff. Vegetated swales can be implemented to provide effective pretreatment for detention and infiltration stormwater BMPs.

Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for small landscaped portions of industrial or commercial facilities with low peak flow rates. They are not well suited to treat stormwater runoff from industrial areas that have insufficient source control BMPs.

Inspection/Maintenance Considerations

A thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

Advanced BMPs Covered

Maintenance Concerns

- *Channelization*
- *Vegetation/Landscape Maintenance*
- *Vector Control*
- *Aesthetics*
- *Flow Obstructions*

Targeted Constituents

Sediment	▲
Nutrients	●
Trash	●
Metals	▲
Bacteria	●
Oil and Grease	▲
Organics	▲

Legend (Removal Effectiveness)

● Low ■High ▲ Medium

✱ Requires Pretreatment

Note: The removal effectiveness ratings shown in the table are for properly designed, sited, and maintained BMPs; some configurations will have variations in pollutant effectiveness.

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Inspection Activities	Suggested Frequency
☐ Inspect after seeding and after first major storms for any damages.	Post construction
☐ Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
☐ Inspect level spreader for clogging, grass alongside slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.	Annual
Maintenance Activities	**Suggested Frequency**
☐ Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. ☐ Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. ☐ Provide weed control, if necessary to control invasive species.	As needed (frequent, seasonally)
☐ Remove litter, branches, rocks blockages, and other debris and dispose of properly. ☐ Maintain inlet flow spreader (if applicable). ☐ Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.	Semi-annual
☐ Declog the pea gravel diaphragm, if necessary. ☐ Correct erosion problems in the sand/soil bed of dry swales. ☐ Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as needed)
☐ Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. ☐ Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As needed (infrequent)

Additional Information

Research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

The swale bottom and side slopes should be covered with dense vegetative cover to filter pollutants out of runoff and helps reduce flow velocities and protect the swale from erosion. Fine, close-growing grasses are ideal because increasing the surface area of the vegetation exposed to runoff improves the effectiveness of the swale. Drought tolerant vegetation than can tolerate sediment and debris accumulations are best-suited for swales.

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Drain Inlet Insert MP-52

General Description

Drain inlet inserts, also known as catch basin, drop inlet or curb inlet inserts, are used to remove pollutants at the point of entry to the storm drain system. There are a multitude of inserts of various shapes and configurations including baffles, baskets, boxes, fabrics, sorbent media, screens, and skimmers. The effectiveness of drain inlet inserts depends on their design, application, loading, and frequency of maintenance to remove accumulated sediment, trash, and debris.

Inspection / Maintenance Considerations

Routine inspection and maintenance is necessary to maintain functionality of drain inlet inserts and to prevent re-suspension and discharge of accumulated pollutants. Maintenance activities vary depending on the type of drain inlet insert being implemented; refer to the manufacturer's recommendations for more information.

Advanced BMPs Covered

Maintenance Concerns

- *Sediment, Trash, and Debris Accumulations*
- *Pollutant Re-suspension and Discharge*

Targeted Constituents*

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

**Removal Effectiveness varies for different manufacturer designs. See New Development and Redevelopment Handbook-Section 5 for more information.*

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Inspection Activities	Suggested Frequency
☐ Verify that stormwater enters the unit and does not leak around the perimeter.	After construction.
☐ Inspect for sediment, trash, and debris buildup and proper functioning.	At the beginning of the wet season and after significant storms
Maintenance Activities	**Suggested Frequency**
☐ Remove accumulated sediment, trash, and debris. ☐ Replace sorbent media.	At the beginning of the wet season and as necessary

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Appendix G: General Permit