

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of Water Quality Certification for the

**SOUTHERN CALIFORNIA EDISON
TIOGA LAKE DAMS GEOMEMBRANE INSTALLATION PROJECT**

**LEE VINING HYDROELECTRIC PROJECT
FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 1388**

SOURCES: Unnamed Tributary to Lee Vining Creek

COUNTY: Mono

WATER QUALITY CERTIFICATION FOR FEDERAL PERMIT OR LICENSE

BY THE EXECUTIVE DIRECTOR:

I. Project Description

The Southern California Edison (SCE or Applicant) Tioga Lake Dams Geomembrane Installation Project (Project) consists of improvements and repairs to the Tioga Lake main dam and auxiliary dam (dams), which are part of the Lee Vining Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 1388).

The Lee Vining Hydroelectric Project is located in the Mono Lake Basin, along Lee Vining Creek, approximately 15 miles west of Lee Vining, California. The dams are located in the Inyo National Forest, outside the Ansel Adams Wilderness Area, at an elevation of 9,638 feet above mean sea level (MSL) on the eastern slope of the Sierra Nevada mountain range, in Mono County, California.

The dams were constructed in 1928. The main dam is a timber-faced rock-fill dam, 27-feet high and 270-feet long. The auxiliary dam is a concrete arch dam, 19-feet high and 50-feet long. The dams impound water from an unnamed tributary to Lee Vining Creek and the surrounding basin. Water is released as required to maintain minimum stream flows.

The spillway is integral with the dam and is a concrete weir side channel located at the right end of the dam. The spillway is 57-feet long and has a crest elevation of 9,650.28 feet above MSL. Water flows from the spillway directly into Lee Vining Creek.

The outlet works consist of one 24-inch diameter steel pipe that passes under the dam near the left abutment. The conduit passes through the base of the dam and discharges flows directly into Lee Vining Creek. The conduit is controlled by a manually-operated, 24-inch, rising stem, gate valve located in a small building at the downstream toe of the dam. The outlet conduit intake is protected by a steel trashrack to prevent large objects from plugging the conduit.

In recent years, increasing instances of leakage have been observed at the dams raising concerns that the capacity of the dams to impound water may be compromised. SCE proposes to install a geomembrane liner along the upstream face of the dams to block current leaks and prevent future leaks. The Project is proposed to commence in fall 2014. Installation of the geomembrane is expected to extend the effective life span of the structure by up to thirty years.

In addition to the geomembrane installation, plinth and outlet structure repairs may be undertaken. The concrete plinth cannot be fully inspected until the reservoir is drained and the plinth is exposed by removing sediment. Repairs, if necessary, may include concrete placement, patchwork, and/or injection grouting. The inspection and repair work would occur after the reservoir has been drained as part of the annual operation of the reservoir during fall and winter months.

Project Construction

Project construction consists of repairs to the deteriorated areas of the dams and installation of a geomembrane liner on the upstream face of the dams. The Project will require the following steps:

- *Monitoring.* SCE will monitor turbidity in Lee Vining Creek for the duration of the Project as required by this water quality certification (certification). Changes in turbidity will not cause nuisance or adversely affect the beneficial uses identified in the *Water Quality Control Plan for the Lahontan Region* (Lahontan Basin Plan). Increases in turbidity will not exceed baseline levels by more than 10 percent.
- *Lake Draining.* Tioga Lake will be drained and the outlet valve will remain open for the duration of the Project, allowing all natural flow to pass through to Lee Vining Creek. The range of natural flows is dependent on snow pack and weather conditions. Dewatering of the lake has the potential to cause adverse effects upon aquatic resources in violation of state water quality standards. This certification therefore contains conditions to prevent such a violation.
- *Access and Work Area Preparation.* Logistics and access have been planned to minimize potential impacts to the natural character of the area. Personnel will be transported to the work area via existing public and operations access roads. Materials and equipment will be transported by vehicles and will be stored in containment structures located adjacent to the dam. A transportation path 20-foot wide will be used in the lakebed for limited transport of equipment between the dams. The work area will be limited to a 20-foot wide belt of lake bottom, parallel and adjacent to the upstream base of the dams. A portion of the work area will be excavated to expose the base of each dam. Lakebed material will be removed from the dams' footings and placed in a location away from the natural stream to prevent inadvertent passage into Lee Vining Creek. A two-foot wide area may be excavated back from the main dam face, to an average depth of approximately two-feet and for a length of approximately 270-feet. A two-foot wide area may be excavated back from the auxiliary dam face, to an average depth of two-feet and for a length of 50-feet. Total excavation would be approximately 50 cubic yards. The excavation width may extend to 10 feet at the spillway end of the main dam, as material deposited against the dam at this location appears to be deeper and thus may require sloping of the excavation to allow safe access to the base of the

main dam. The excavation will expose the footing of the dams, to which the new geomembrane will be anchored. The footing does not need to be re-covered at the completion of the liner installation. Excavated material will be left in place in the reservoir bed or used to backfill the liner bottom anchoring.

- *Dams Face Cleaning.* Ladders and swingstages will be used, as needed, to access the dams upstream face. Loose material will be removed from the dams upstream face by brushing and rinsing with water as needed. Power washing will not be used on the dams upstream face. Appropriate Best Management Practices (BMPs) will be implemented during all cleaning activities in order to prevent contamination of existing waterways, as described in Attachment A of this certification – *BMPs for the Tioga Lake Dam and Auxiliary Dam Geomembrane Installation Project 2014*. The area for the perimeter seal will be power washed and the surface will be ground smooth. The perimeter seal area consists of a four to six-inch wide strip along the top, bottom and abutments of the dams. Concrete or rock in this area will be ground with grinders to create a smooth surface for a good seal.
- *Deteriorated Concrete Repair, Trashrack Inspection and Outlet Structure Repairs.* Deteriorated areas on the upstream side of the dams (foundation and outlet structure) will be repaired, if deemed necessary, with a cementitious material appropriate to the repair process and environmental exposure. Deteriorated concrete will be removed by chipping and brushing until suitable base material is exposed. Larger areas will utilize doweling and reinforcing steel for proper anchoring of the new material. Cementitious material will be mixed away from any waterway and will be placed in the prepared areas using an appropriate method (pressure and/or hand placement). The trashrack grids, supporting concrete structure and outlet pipe will be inspected and dimensions will be field verified in order to support any future refurbishing of the trashrack and outlet structure. Any material removed or used during installation, including foundation grouting, will be prevented from entering the stream flow by use of plastic sheeting, silt fencing, straw bales, or other appropriate BMPs as described in the *BMPs for the Tioga Lake Dams Geomembrane Installation Project 2014* (Attachment A).
- *Geomembrane Installation.* The geomembrane installation will proceed in sections beginning at one end of each dam and continuing across the face. Given the relatively short height of the dams, ladders and swingstages will be used, as needed, to access the wood face. Scaffolding will not be used. Personnel will work using hand-held power tools along the top of the dam and along the footing to affix the geomembrane in place. Affixing the geomembrane will include the following steps:
 - Install stainless steel perimeter seal anchors along abutments, crest, and bottom of dam.
 - Install geonet/geotextile composite cushioning/drainage layer over upstream face of dam.
 - Install stainless steel tensioning profiles to anchor geomembrane to dam face.
 - Install geomembrane (PVC geocomposite) sheets vertically over upstream dam face and attach to stainless steel profiles.
 - Anchor geomembrane along top of dam (not a watertight seal)

- Weld adjacent geomembrane sheets.
 - Install upper tensioning profiles.
 - Install cap strip over tensioning profiles.
 - Quality Control test all welds.
 - Drill drainage lines through wood facing and install drainage discharge plates on upstream face.
 - Install watertight stainless steel perimeter seal along abutments and bottom of dam.
- *Proposed Schedule.* Tioga Lake will be drained by September 2014. Mobilization of equipment and materials to the site is scheduled to begin September 3, 2014, or earlier if conditions permit. Geomembrane installation, concrete repairs, and outlet structure inspection are scheduled to begin late September of 2014 (earlier if possible), and are planned to be complete in approximately 4 weeks (around October 31, 2014). Demobilization is planned to be completed by early November 2014.

II. Regulatory Authority

Water Quality Certification and Related Authorities

The Federal Clean Water Act (CWA) (33 U.S.C. §§ 1251-1387) was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." (33 U.S.C. § 1251(a).) Section 101 of the CWA (33 U.S.C. § 1251 (g)) requires federal agencies to "co-operate with the State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources."

Section 401 of the CWA (33 U.S.C. §1341) requires every applicant for a federal license or permit which may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the CWA, including water quality standards and implementation plans promulgated pursuant to section 303 of the CWA (33 U.S.C. § 1313). CWA section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the CWA and with any other appropriate requirement of state law. Section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the project. The State Water Resources Control Board (State Water Board) is the state agency responsible for such certification in California. (Wat. Code, § 13160.) The State Water Board's Executive Director may issue a decision on a certification application. (Cal. Code Regs., tit. 23, § 3835, subd. (a).)

The application for certification was received on April 11, 2014. The State Water Board provided public notice of the application pursuant to California Code of Regulations, title 23, section 3858 by posting information describing the Project on the State Water Board's website on May 8, 2014. No comments were received.

SCE applied for a Nationwide Permit Letter of Permission from the Army Corps of Engineers (ACOE) under section 404 of the CWA. The Letter of Permission from the ACOE is contingent upon certification by the State Water Board.

SCE submitted an application for a Lake or Stream Alteration Agreement to the California Department of Fish and Wildlife (CDFW) for Project activities on March 26, 2014.

Water Quality Control Plans

The California Regional Water Quality Control Boards adopt, and the State Water Board approves, water quality control plans (basin plans) for each watershed basin in the State. The basin plans designate the beneficial uses of waters within each watershed basin, and water quality objectives designed to protect those uses pursuant to section 303 of the CWA. (33 U.S.C. § 1313.) The beneficial uses together with the water quality objectives that are contained in the basin plans constitute State water quality standards.

The Lahontan Regional Water Quality Control Board (Lahontan Regional Water Board) adopted, and the State Water Board and U.S. Environmental Protection Agency approved, the Water Quality Control Plan for the Lahontan Region (Lahontan Basin Plan). Existing beneficial uses designated for Lee Vining Creek include municipal and domestic supply, agricultural supply, ground water recharge, freshwater replenishment, hydropower generation, water contact recreation, non-contact water recreation, commercial and sport fishing, cold freshwater habitat, wildlife habitat, and spawning (spawning, reproduction, and development). Protection of the instream beneficial uses identified in the Lahontan Basin Plan requires maintenance of adequate instream flows as well as effluent limitations and other limitations on discharges of pollutants from point and non-point sources to Lee Vining Creek and its tributaries.

California Environmental Quality Act

The State Water Board has reviewed the proposed Project and conditions incorporated into the Project to protect the environment and beneficial uses designated for Lee Vining Creek. The State Water Board has determined that this Project involves the repair and maintenance or minor alteration of an existing facility and therefore is categorically exempt from the requirements of the California Environmental Quality Act (Cal. Code Regs., tit. 14, § 15301). A Notice of Exemption has been prepared. The State Water Board will file a Notice of Exemption within five days of issuance of this certification.

State Water Board Authority

California Code of Regulations, title 23, section 3860 requires imposition of certain mandatory conditions for all certifications, which are included in this certification. Further, State Water Board staff considered the Lahontan Basin Plan, the existing water quality conditions, and Project-related controllable factors in the development of this certification.

In order to ensure that the Project operates to meet water quality standards as anticipated, and to ensure that the Project will continue to meet state water quality standards and other appropriate requirements of state law over its lifetime, this certification imposes conditions regarding monitoring, enforcement, and potential future revisions. This certification requires the Applicant to submit to the Deputy Director for Water Rights (Deputy Director) a Tioga Lake Water Quality Monitoring Plan. The Applicant will follow the *BMPs for the Tioga Lake Dams Geomembrane Installation Project 2014* (Attachment A), which are incorporated as conditions in this certification.

III. **Findings**

The State Water Board has found that, with the conditions and limitations imposed under this certification, the proposed Project will be protective of the state water quality standards and other appropriate requirements of state law.

ACCORDINGLY, BASED ON ITS INDEPENDENT REVIEW OF THE RECORD, THE STATE WATER RESOURCES CONTROL BOARD CERTIFIES THAT SOUTHERN CALIFORNIA EDISON'S TIOGA LAKE DAMS GEOMEMBRANE INSTALLATION PROJECT will comply with sections 301, 302, 303, 306, and 307 of the CWA, and with applicable provisions of State law, if the Applicant complies with the following terms and conditions during the Project activities certified herein.

CONDITION 1. SCE shall comply with the Project construction description and drawings submitted to State Water Board staff.

CONDITION 2. SCE shall monitor water quality during construction and immediately report any discharge or violation of the water quality objectives to the State Water Board and Lahontan Regional Water Board staff.

CONDITION 3. SCE shall submit a Tioga Lake Water Quality Monitoring Plan to the Deputy Director for review and approval. Constructio of the Project shall not start until the Tioga Lake Water Quality Monitoring Plan has been approved by the Deputy Director. The Tioga Lake Water Quality Monitoring Plan shall include at a minimum how SCE will: 1) determine baseline conditions prior to construction, 2) determine monitoring locations and monitoring schedule, and 3) report monitoring results. All monitoring results shall be submitted to State Water Board staff on a monthly basis until the Project is completed.

CONDITION 4. SCE shall follow the *BMPs for the Tioga Lake Dams Geomembrane Installation Project 2014* included as Attachment A of this certification. Notwithstanding any more specific conditions in this certification, the Applicant shall comply with all measures described in the application for certification and its supplements.

CONDITION 5. Construction work shall occur during the dry season. SCE shall maintain the required minimum instream release flows of two-cubic feet per second or the natural flow into Tioga Lake, which ever is less, below Tioga Lake at all times. Fisheries effects (e.g., a fish kill or fish observed in obvious distress) resulting from any deviations from prescribed flow shall be minimized and reported immediately to CDFW, the Executive Officer for the Lahontan Regional Water Board (Executive Officer) and the Deputy Director.

CONDITION 6. In 2013, the United States Fish and Wildlife Service proposed critical habitat for Yosemite toad and Sierra Nevada yellow-legged frog. Both of these species are known to have occurred along the margins of Tioga Lake in the past and may still occupy lakeside habitats. An Environmental Awareness Program shall be implemented so that all construction crew are aware of the potential for these species' presence and the procedures to follow if found during construction. SCE shall conduct a pre-construction survey to confirm the absence of these species within 15 days of the initial construction equipment

mobilization. If Yosemite toad or Sierra Nevada yellow-legged frog are found, a qualified biologist shall be present on-site for the duration of the Project.

CONDITION 7. All water quality compliance monitoring shall be conducted using procedures described in Code of Federal Regulations Title 40, Chapter I, Subchapter D, Part 136 (40 C.F.R. § 136) and State Water Board's Surface Water Ambient Monitoring Program methods.

CONDITION 8. Project activities shall not cause an increase in turbidity downstream of the Project area greater than those identified in the Lahontan Basin Plan. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent. Minimum sampling frequency shall be three times per day during construction of the Project with potential discharge to surface waters. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The Applicant shall monitor turbidity levels 50-feet upstream of Project activities (i.e., natural background) and 300-feet downstream of the point of construction activities. If an increase in turbidity caused by Project activities is observed between the upstream and downstream sampling locations, monitoring frequency shall be a minimum of every hour during this period. If three consecutive sample results or a 24-hour average turbidity indicate that turbidity levels exceed the limits shown above, the associated Project activities shall cease immediately. In addition, any and all actions shall be implemented immediately to reduce and maintain turbidity at or below the given thresholds. Turbidity shall be measured using nephelometry and in accordance with Condition 7 requirements. A hand-held field meter may be used, provided the meter uses a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. For each meter used for monitoring, a calibration and maintenance log shall be maintained onsite and provided to State Water Board staff upon request. If monitoring shows that turbidity has exceeded the water quality objective, construction will cease and the violation will be reported immediately to the Deputy Director and the Executive Officer. Construction activities may not re-start without the permission of the Deputy Director.

CONDITION 9. Any equipment used in direct contact with surface water shall be steam cleaned prior to use. Wash water shall be contained and disposed of in compliance with State and local laws, ordinances, and regulations.

CONDITION 10. Construction material, debris, spoils, soil, silt, sand, bark, slash, sawdust, rubbish, steel, other organic or earthen material, and any other substances which could be hazardous to aquatic life resulting from Project related activities shall be prevented from entering surface waters.

CONDITION 11. No unset cement, concrete, grout, damaged concrete, concrete spoils, and wash water used to clean concrete surfaces shall contact or enter surface waters.

CONDITION 12. Any maintenance or refueling of vehicles or equipment occurring on-site will be done in a designated area with secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. All equipment using gas, oil, hydraulic fluid or other petroleum products shall be inspected for leaks prior to use and shall be monitored for leakage. Stationary equipment (motors, pumps, generator, etc.) and vehicles not in use shall be positioned over drip pans or other types of containment.

Spill and containment equipment (oil spill booms, sorbent pads, etc.) shall be maintained onsite at all locations where such equipment is used or staged.

CONDITION 13. All equipment must be washed prior to transport to the Project site and must be free of sediment, debris and foreign matter. Wash water shall be contained and disposed of in compliance with State and local laws, ordinances, and regulations.

CONDITION 14. All imported riprap, rocks, and gravels used for construction shall be pre-washed. Wash water shall be contained and disposed of in compliance with State and local laws, ordinances, and regulations.

CONDITION 15. All construction debris and trash shall be contained and regularly removed from the work area to the staging area during construction activities. Upon completion, all Project-generated debris, building materials, excess material, waste, and trash shall be removed from all the Project sites for disposal at an authorized disposal site. Excavated material may be left in place in the reservoir bed or used to backfill the liner bottom anchoring provided that Basin Plan water quality objectives are not exceeded. If excavated material is left on site, the Applicant shall monitor water quality during and after filling up Tioga Lake and report the results to the Deputy Director and the Executive Officer.

CONDITION 16. A copy of this certification shall be provided to any contractor and all subcontractors conducting the construction work, and copies shall remain in their possession at the Project site. The Applicant shall be responsible for work conducted by its contractor or subcontractors.

CONDITION 17. The Deputy Director and the Executive Officer shall be notified one week prior to the commencement of ground disturbing activities. Upon request, a construction schedule shall be provided to State Water Board and Lahontan Regional Water Board staff in order for staff to be present onsite, to answer any public inquiries during construction, and to document compliance with this certification. The Applicant shall provide State Water Board and Lahontan Regional Water Board staff access to the Project site to document compliance with this certification.

CONDITION 18. If at any time an unauthorized discharge to surface waters (including rivers or streams) occurs or monitoring indicates that the Project has or could soon be in violation of water quality objectives, the associated Project activities shall cease immediately and the Deputy Director and the Executive Officer shall be notified. Associated activities will not resume without approval from the Deputy Director.

CONDITION 19. Unless otherwise specified in this certification or at the request of the Deputy Director, data and/or reports must be submitted electronically in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with California Water Code section 13167.

CONDITION 20. The State Water Board reserves authority to modify this certification if monitoring results indicate that continued operation of the Project could violate water quality objectives or impair the beneficial uses of Lee Vining Creek or its tributaries.

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CONDITION 21. This certification is contingent on compliance with all applicable requirements of the Lahontan Basin Plan. The Applicant shall notify the Deputy Director and the Executive Officer within 24 hours of any unauthorized discharge to surface waters.

CONDITION 22. Notwithstanding any more specific conditions in this certification, the Project shall be operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the CWA. The Applicant must take all reasonable measures to protect the beneficial uses of Lee Vining Creek and its tributaries.

CONDITION 23. This certification does not authorize any act which results in the taking of a threatened, endangered or candidate species or any act, which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (ESA) (DFG Code §§ 2050-2097) or the federal ESA (16 U.S.C. §§ 1531-1544). If a "take" will result from any act authorized under this certification or water rights held by the Applicant, the Applicant must obtain authorization for the take prior to any construction or operation of the portion of the Project that may result in a take. The Applicant is responsible for meeting all requirements of the applicable ESAs for the Project authorized under this certification.

CONDITION 24. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation is subject to any remedies, penalties, process or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the CWA, the applicability of any state law authorizing remedies, penalties, processes or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this certification.

CONDITION 25. In response to a suspected violation of any condition of this certification, the State Water Board or Lahontan Regional Water Board may require the holder of any federal permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. (Wat. Code, §§ 1051, 13165, 13267 and 13383.) The State Water Board may add to or modify the conditions of this certification as appropriate to ensure compliance.

CONDITION 26. No construction shall commence until all necessary federal, state, and local approvals are obtained.

CONDITION 27. This certification is contingent on compliance with all pertinent permits and orders issued by the Lahontan Regional Water Board, and compliance with the terms and conditions of all water right licenses and permits applicable to this Project, existing, or as amended, by the State Water Board.

CONDITION 28. Any requirement in this certification that refers to an agency whose authorities and responsibilities are transferred to or subsumed by another state or federal agency, will apply equally to the successor agency.

CONDITION 29. The Applicant must submit any changes to the Project, including Project operation, which would have a significant or material effect on the findings, conclusions, or conditions of this certification, to the State Water Board for prior review and written approval. If the State Water Board is not notified of a significant change to the Project, it will be considered a violation of this certification.

CONDITION 30. The State Water Board may provide notice and an opportunity to be heard in exercising its authority to add or modify any of the conditions of this certification.

CONDITION 31. This certification is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing with section 3867).

CONDITION 32. Certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to California Code of Regulations, title 23, section 3855, subdivision (b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

CONDITION 33. Certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, division 3, chapter 28.



Thomas Howard
Executive Director

July 31, 2014
Date

Attachment A: BMPs for the Tioga Lake Dams Geomembrane Installation Project 2014 (as submitted by the Applicant)

ATTACHMENT A

**BMPs for the
Tioga Lake Dams Geomembrane Installation Project
2014**

Proposed BMPs are summarized below, followed by a detailed purpose and approach organized by topic.

- Any materials generated by rip-rap installation operations will not be stored within the Lake bed area, but will be removed for disposal in an approved disposal site. (BMPs: Waste Management)
- No foreign materials, such as petroleum or other fuels, will be released into the streambed. All fueling will be performed outside of the streambed. All equipment will be kept in good working order and inspected for leaks prior to use in the streambed. Equipment will be staged in containment or other suitable barrier overnight to prevent accidental leakage of fluids. (BMPs: Material Delivery and Storage, Vehicle and Equipment Maintenance, Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling)
- Any spills will be cleaned up immediately. (BMPs: Vehicle and Equipment Maintenance, Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling, Hazardous Waste Management)
- When fueling must occur onsite, a designated fueling area will be used. Absorbent spill clean-up materials and spill kits will be available in fueling areas. Drip pans or absorbent pads will be used during vehicle and equipment fueling. Fueling areas will be protected from storm water runoff and runoff, and will be located at least 50 ft from watercourses. Fuels will be stored in containment basins. (BMPs: Vehicle and Equipment Fueling, Spill Prevention and Control)
- Equipment washing or cleaning onsite is discouraged. When equipment washing or cleaning must occur onsite, the cleaning area will be located away from water courses. Wash water will be minimized, contained and will not enter water courses. (BMPs: Vehicle and Equipment Cleaning)
- Vehicles and equipment will be inspected on each day of use for leaks. Leaks will be repaired immediately or problem vehicles or equipment will be removed from the project site. (BMPs: Vehicle and Equipment Maintenance)
- No litter or rubbish will be deposited in the streambed area or any other portion of the work area. All litter and rubbish will be deposited in an appropriate container and hauled out daily from the work area. (BMPs: Solid Waste Management)
- Sediment control measures, such as silt fences, will be employed to intercept and slow the flow of storm water to settle and trap sediment. Silt fences will be placed between the stream channel and areas where storm water could wash

disturbed sediments from work activity into the stream channel. The silt fence will be inspected before and after each rainfall event. The fence will be repaired as needed. (BMPs: Silt Fence)

- Sand bags will be used to manage sediment control downstream of the construction area. Sand bags are effective for placement in live streams, not silt fences or straw bales. (BMPs: Sand Bags)
- Spills will be cleaned up immediately and will not be buried or washed with water. (BMPs: Spill Prevention and Control, Hazardous Waste Management)
- Spilled material will be prevented from entering water courses. Gravel bags should be installed along the river edge of the access road to contain or reduce velocity of potential spills and sediments. (BMPs: Spill Prevention and Control, Hazardous Waste Management)
- Used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for clean up will be stored and disposed of properly. Hazardous and non-hazardous material should be disposed of in the manner specified by the manufacturer. (BMPs: Hazardous Waste Management)
- All vehicles and personnel will be confined to designated roadways and accessways.
- Stockpiled material should be covered with plastic or erosion control blankets.
- Temporary sanitary facilities will be located away from watercourses and drainage facilities.
- Temporary sanitary facilities will be maintained in good working order.

BMP: Concrete Waste Management

Description

Prevent or reduce the discharge of pollutants to storm water from concrete waste or rip-rap by conducting washout off site, washing in designated areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water and training employees and subcontractors.

Approach

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on site.
- Perform washout of concrete trucks off site or in designated areas only. Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on site, except in designated areas.
- For onsite washout:
 - Locate washout area at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
 - Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed of properly.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water to a bermed or level area.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stock pile, or dispose in the trash.
- Educate employees and subcontractors in proper concrete waste management.

Requirements

Costs (Capital, O&M)

- All of the above are low cost measures.

Maintenance

- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

Limitations

- Off-site washout of concrete wastes may not always be possible.

BMP: Material Delivery and Storage

Description

Prevent or reduce the discharge of pollutants to storm water, lake, and or creek from material delivery and storage by minimizing the storage of hazardous materials on site, storing materials in a designated area, installing secondary containment, conducting regular inspection, and training employees and subcontractors.

This best management practice covers only material delivery and storage.

Approach

The following materials are commonly stored on construction sites:

- Pesticides and herbicides;
- Fertilizers;
- Detergents;
- Petroleum products such as fuel, oil, and grease; and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Storage of these materials on site can pose the following risks:

- Storm water contamination;
- Injury to workers or visitors;
- Groundwater contamination, and
- Soil contamination.

Therefore, the following steps should be taken to minimize your risk:

- Designate an area of the construction site for material delivery and storage.
 - Place near the construction entrance, away from waterways
 - Avoid transport near drainage paths or waterways
 - Surround with earth berms (see DRI, Earth, Dika)
 - Place in an area which will be used to stabilize any residential materials
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- Keep your inventory down. Store only the amount you need, for only as long as you need it.
- Store as few hazardous materials on site as possible.
- Handle hazardous materials as infrequently as possible.

- Whenever possible, store materials in a covered area with secondary containment such as an earthen dike, horse trough, or even kid's wading pool for non-reactive materials such as detergents, oil, grease and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containment.
- If drums must be kept in an uncovered area, store them at a slight angle to reduce ponding of rainwater in the lids and to reduce corrosion.
- Try to keep chemicals in their original containers, and keep them well labeled.
- Train employees and subcontractors.
- Employees trained in emergency spill cleanup procedures should be present when dangerous materials or liquid chemicals are unloaded.

Requirements

Cost (Capital, O & M)

- All of the above are low cost measures.

Maintenance

- Keep the designated storage area clean and well organized.
- Conduct routine weekly inspections and check for external corrosion of material containers.
- Keep an ample supply of spill cleanup materials near the Storage area.

Limitations

- Storage sheds often must meet building and fire code requirements.

BMP: Vehicle and Equipment Maintenance

Description

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance by running a "dry site." This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.

Approach

- Keep vehicles and equipment clean; don't allow excessive buildup of oil and grease.
- Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicle or equipment fluids may spill or leak onto the ground can pollute stormwater. If you maintain a large number of vehicles or pieces of equipment, consider using an offsite repair shop. These businesses are better equipped to handle vehicle fluids and spills properly.
- Performing this work off site can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur on site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and runoff of spills.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Regularly inspect on-site 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 on site.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.

Requirements

Costs (Capital, O&M)

- All of the above are low cost measures.

Maintenance

- Keep ample supplies of spill cleanup materials on site.
- Inspect maintenance areas on a regular schedule.

Limitations

- Sending vehicles/equipment off site should be done in conjunction with BMP C/PS8 (Stabilized Construction Entrance).

Additional Information - Vehicle and Equipment Maintenance

Outdoor vehicle or equipment maintenance is a potentially significant source of storm water, lake or creek pollution. Activities that can contaminate these waters include engine repair and service, particularly changing or replacement of fluids, and outdoor equipment storage and parking (dripping engines).

Listed below is further information if you must perform vehicle or equipment maintenance on site.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, 1, 1, 1-trichloroethane, or methylene chloride. Many of these parts cleaners are harmful and must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents (1, 1, 1 -trichloroethane, methylene chloride, etc.) 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. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling/Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate storm water. 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.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Do not bury used tires.

BMP: Vehicle and Equipment Cleaning

Description

Prevent or reduce the discharge of pollutants to storm water, lake, or creek from vehicle and equipment cleaning by using off-site facilities, washing in designated areas only, eliminating discharges to the storm drain, or other areas where the pollution may reach the lake or creek by infiltrating or recycling the wash water and training employees and subcontractors.

Approach

- Use off-site commercial washing businesses as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto the ground can pollute storm water.
- If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on site, use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area.
- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning on site. Steam cleaning can generate significant pollutant concentrations leading to potential storm water and groundwater contamination.

Requirements

Costs (Capital, O&M)

- All of the above are low cost measures.

Maintenance

- Minimal; some berm repair maybe necessary.

Limitations

- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off site should be done in conjunction with PS7 (Stabilized Construction Entrance).

BMP: Vehicle and Equipment Fueling

Description

Prevent fuel spills and leaks, and reduce their impacts to storm water, lake, or creek by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

Approach

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto the ground can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.
- Do not use mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps small forklifts, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.

Requirements

Costs (Capital, O&M)

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

Maintenance

- Keep ample supplies of spill cleanup materials on site.
- Inspect fueling areas and storage tanks on a regular schedule.

Limitations

- Sending vehicles/equipment off site should be done in conjunction with PS7 (Stabilized Construction Entrance).

BMP: Solid Waste Management

Description

Prevent or reduce the discharge of pollutants to storm water, lake or creek from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Approach

Solid waste is one of the major pollutants resulting from construction. Construction debris includes:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction,
- Packaging materials including wood, paper and plastic,
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, masonry products, and
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes.

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

- Select a designated waste collection area on site.
- When possible, locate containers in a covered area.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it's windy.
- Collect site trash daily.
- Erosion and sediment control devices tend to collect litter. Remove this solid waste promptly.
- Salvage or recycle any useful material.
- Make sure that toxic liquid wastes (used oils, solvents, paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.

- If a container does spill, clean up immediately.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Train employees and subcontractors in proper solid waste management.

Requirements

Costs (Capital, O&M)

- All of the above are low cost measures.

Maintenance

- Collect site trash daily.
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

Limitations

- There are no major limitations to this best management practice.

BMP: Silt Fence

General Description

A silt fence is a temporary sediment barrier consisting of filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of the fabric used, supported with wire fence. Silt fences trap sediment in two ways: (1) by intercepting and detaining small amounts of sediment from disturbed areas during construction operations in order to remove sediment from behind the fence; and (2) by decreasing the velocity of flows up to 0.5 cfs in swales.

Silt fences may be used for perimeter control, placed upstream of the point(s) of discharge of runoff from a site, but before the flow becomes concentrated. They may also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion, and perpendicular to minor swales or ditch lines for up to one acre contributing drainage areas. Silt fences are not intended for use in detaining concentrated flows, and are only applicable for sheet or overland flows.

Suitable Applications

- Along the perimeter of the site
- Along streams and channels
- Across swales with small catchments
- Below the toe of a cleared slope
- Around temporary spoil areas
- Below other small cleared areas

Installation/Application

Planning:

Silt fences are preferable to straw barriers in many cases. Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. While the failure rate of silt fences is lower than that of straw barriers, there are many instances where silt fences have been improperly installed. The following installation methods can improve performance and should be followed:

- Construct along a level contour.
- Silt fences should remain in place until the disturbed area is permanently stabilized.
- Provide sufficient room for sediment removal equipment between the silt fences and toes of slopes or other obstructions.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.

- Leave an undisturbed or stabilized area immediately downslope from the fence.
- Do not place in live streams or intermittently flowing channels.

Design:

Limit the upstream drainage area to 1 acre or less when used alone or in combination-with-sediment basin in a larger site.

Limit the maximum slope perpendicular to the fence line, should be 1:1.

Limit the maximum sheet or overland flow path length to any point along the fence to 100 feet.

Limit the concentrated flows reaching the fence to 0.5 cfs.

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the support fence (which affect the choice of tensile strength). The designer shall specify a filter fabric that retains the soils found on the construction site yet will have openings large enough to permit drainage and prevent clogging. The following criteria are recommended for selection for the equivalent opening size:

- If 50 percent or less of the soil, by weight, will pass the U.S. Standard Sieve No. 200, select the EOS to retain 85 percent of the soil. The EOS should not be finer than EOS 70.
- For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 (0.0083 in. [0.21 mm.]) except where direct discharge to a stream, lake or wetland will occur, then the EOS shall be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U. S. Standard Sieve No. 100 (0.0059 in. (0.15 mm)). If 85 percent or more of a soil, by weight, passes through the openings in a No. 200 sieve (0.0029 in. (0.074 mm)), filter fabric shall not be used. Most of the particles in such a soil would not be retained if the EOS was too large, and they would clog the fabric quickly if the EOS was small enough to capture the soil.

The fence should be supported by a wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F to 120°F.

Installation Guidelines:

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

- Posts should be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 30 inches.

- b. A trench should be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
- c. When standard strength filter fabric is used, a wire mesh support fence should be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire should extend into the trench a minimum of 4 inches.
- d. The standard strength filter fabric should be stapled or wired to the fence, and 20 inches of the fabric should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated and filter fabric stapled or wired directly to the posts.
- e. The filter fabric should be purchased in a continuous role/piece, cut to the length of the barrier to avoid use of joints. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 inch overlap, and both ends securely fastened to the post.
- f. The trench should be backfilled with 3/4-inch minimum diameter washed gravel or compacted native material.

Requirements

Maintenance

- Inspect monthly during dry periods and immediately after each rainfall. Repair as necessary. Sediment must be removed when it reaches approximately one third the height of the fence, especially if heavy rains are expected.
- Filter fences should not be removed until the upslope area has been permanently stabilized.

Limitations

- Filter fences will create a temporary sedimentation pond on the upstream side of the fence which may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Filter fences are not practical where large flows of water are involved, hence the need to restrict their use to drainage areas of one acre or less, and flow rates of less than 0.5 cfs.
- Problems may arise from incorrect selection of pore size and/or improper installation.
- Do not allow water depth to exceed 1.5 feet at any point.
- Improperly installed fences are subject to failure from undercutting, overlapping, or collapsing.

BMP: Sand Bag Barrier

General Definition

Stacking sandbags along a level contour creates a barrier which detains sediment-laden water, ponding water upstream of the barrier and promoting sedimentation.

Suitable Applications

Sandbag berms may be used during construction activities in stream beds and utility construction in channels, temporary channel crossing for construction equipment, etc. Sandbag berms may also be installed parallel to roadway construction. Sandbag berms may also be used to create temporary sediment traps, retention basins and in place of straw bales or silt fences. Examples of applications include:

- Check dams across stream channels
- Barrier for utility trenches or other construction in a stream channel
- Temporary channel crossing
- Barrier on a slope in place of straw bales or silt fences
- Direct or divert flow
- Create temporary sediment basin or retention basin
- Near the toe of slopes
- At construction perimeter

Advantages

- Provides a semi-permeable barrier in potentially wet areas
- More permanent than silt fences or straw bales
- Allows for easy relocation on site to meet changing needs during construction

Installation/Application

Sandbag berms are appropriate to use when construction of check dams or sumps in a stream is undesirable. The sandbag berms can provide the same function as a check dam without disturbing the stream or vegetation. The sandbag berm will also allow a small sediment retention area to be created prior to construction of final detention basins. For installation of a sandbag berm, the following criteria should be observed:

- Drainage Area - Up to -five (5) acres
- Height of Berm - 18 inches minimum height, measured from the top of the existing ground at the upslope toe to the toe of the barrier
- Width of Berm - 48 inches minimum width measured at the bottom of the barrier; 18 inches at the top
- Sandbag Size – length: 24 to 30 inches, width: 16 to 18 inches, and thickness: 6 to 8 inches. Weight: 90 to 125 pounds.

- Sandbag Material - Polypropylene, polyethylene or polyamide woven fabric, minimum unit weight four (4) ounces per square yard, mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70 percent. Use of burlap is discouraged since it rots and deteriorates easily.
- Grade of Sand - Coarse sand, gravel.
- Streambed Materials will be used for sandbags
- Runoff water shall flow over the tops of the sandbags or through four (4) inch polyvinyl chloride.

Requirements

Maintenance

- Inspect after each rain
- Reshape or replace damaged sandbags immediately
- Remove sediment when it reaches six inches in depth

Limitations

- Sandbags are more expensive than other barriers, but also more durable
- Burlap should not be used for sandbags

BMP: Spill Prevention and Control

Description

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

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

Approach

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

General Measures

- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.

Cleanup

- Clean up leaks and spills immediately.
- 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 an absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up or excavate the material and dispose of properly. See the waste management BMPs in this chapter for specific information.

Reporting

- Report spills to local agencies, such as the Fire Department; they can assist in the cleanup.
- 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 hours).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur on site, use a designated area, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Regularly inspect on-site 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 on site.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under parking equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down or burying 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 trash cans or dumpsters can leak oil and contaminate storm water. 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

- If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

Requirements

Costs (Capital, O & M)

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

Maintenance

- Keep ample supplies of spill control and cleanup materials on site, near storage, unloading, and maintenance areas.
- Update your spill cleanup materials as changes occur in the types of chemicals on site.

Limitations

- If necessary, use a private spill cleanup company.

BMP: Hazardous Waste Management

Description

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

Approach

Many of the chemicals used on site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and solvents,
- Petroleum products such as oils, fuels, and grease,
- Fertilizers, herbicides and pesticides,
- Acids for cleaning masonry,
- Soil stabilization additives such as calcium carbonate,
- Asphalt products, and
- Concrete curing compounds.

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

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

The following steps will help reduce storm water pollution from hazardous wastes:

Material Use

- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.
- Do not over apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Till fertilizers and lime into soil rather than hydro-seeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.

Waste Recycling/Disposal

- Select a designated waste collection area on site.

- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix waste. This can cause chemical reactions, make recycling impossible, and complicate disposal.
- Recycle any useful material such as used oil.
- Make sure that toxic liquid wastes (used oils, solvents, paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Training

- Train employees and subcontractors in proper hazardous waste management.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

Requirements

Costs (Capital, O&M)

- All of the above are low cost measures.

Maintenance

- Inspect hazardous waste receptacles and area regularly.
- Arrange for regular hazardous waste collection.

Limitations

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.