Facilities management encompasses a broad range of activities, including:

1. Storage, repair, and maintenance of vehicles, equipment, and related support materials
2. Fueling and washing of vehicles and equipment
3. Maintenance of buildings, stormwater drainage systems and landscaping
4. Storage of sand, salt, asphalt, rock, and pesticides
5. Storage of wastes generated on site
6. Bulk storage of sediment, litter and debris generated by road maintenance activities

Environmental stewardship in the course of these activities requires both structural and non-structural management practices. Examples of non-structural practices include procedures for performing operational activities, such as salt/sand mixing/loading that requires removal of all salt from the area surface after loading. The installation of a physical device that alters the release, transport, or discharge of pollutants from surface storm or melt water or facility-generated shop floor drain or washbay effluent is a structural practice.

Many environmental stewardship practices at maintenance facilities have to do with protection of water quality. EPA regulations have long required facilities to obtain National Pollution Discharge Elimination System (NPDES) permits for discharges, especially washbay and shop floor drain effluent discharges to the waters of the State. Such permit obligations arise under the Industrial Permitting portion of NPDES, and have received increased attention as state regulatory agencies have expanded beyond their initial focus on manufacturing facilities in implementation of this program. Brief summaries of federal water quality and wetlands requirements applicable to the transportation community are available at AASHTO’s Center for Environmental Excellence.

### 6.1 Planning and Prioritizing Environmental Improvements at Maintenance Facilities

**Maintenance Facility Pollution Prevention Plans**

Facility Pollution Prevention Plans (FPPP) are typically developed for each maintenance facility owned or operated by a DOT. The FPPPs describe the activities conducted at the facility and the management practices to be implemented to reduce the discharge of pollutants in stormwater runoff from these facilities. The following practices are recommended:

1. District Maintenance Director or Environmental Personnel should be responsible
for ensuring that Facility Pollution Prevention Plans (FPPPs) are developed for each maintenance facility.

2 The FPPPs should identify the work activities at each facility along with the corresponding BMPs that should be implemented.

3 Supervisors should inspect their maintenance facilities monthly to monitor the implementation and adequacy of the BMPs.

4 A report that includes the date of the inspection, the name of the inspector, observations, and recommended corrective actions should be prepared by the Supervisor.

5 All inspection records should be maintained for a period of 3 years. Any observed instances of non-compliance should be reported to the Stormwater Coordinator.

6 In addition to monthly facility inspections conducted by the facility supervisor, the more in depth review should occur in at least 20 percent of each District’s facilities each year.

7 These reviews should monitor each facility’s documentation (e.g., FPPP, monthly inspection reports, etc.) and include a thorough yard inspection.

8 Each District Maintenance Stormwater Coordinator should prepare a report including the date of the inspection, name(s) of the inspector, observations, and recommended corrective actions.

9 All FPPP records should be maintained for a period of 3 years by the Maintenance Supervisor.

10 Any observed instances of noncompliance should be reported in accordance with procedures.

11 In addition to inspections conducted by the facility supervisors DOTs may employ an audit program or other supplementary compliance monitoring to support continual improvement.

Environmental Information & Management Systems for Maintenance Facilities

Environmental management systems are increasingly used by state DOTs to avoid generation of pollution and manage operations for continual environmental improvement. Examples follow, some of which are described in greater detail in sections 2.5, Measuring Environmental Performance and 2.6, Environmental Staffing, Roles, and Responsibilities. Short of an EMS, a number of DOTs conduct surveys of all maintenance facilities to establish compliance with federal, state and local environmental regulations. Missouri DOT’s survey is included in the Appendix.

Maine DOT’s EMS for Facilities

Maine DOT has developed and implemented Environmental Management Systems for all MDOT facilities. Combined Environmental and Office of Health and Safety Administration (OSHA) policy and procedure manuals are targeted to the managers who have responsibility for implementation. Quick reference environmental practice
guides—written as a companion guide to the policies and procedures—were developed for supervisors and field crews. MDOT’s commitment to conduct annual audits of its facilities to systematically review the effectiveness of these policies and procedures has been an important aspect of implementing new environmental procedures. An Environmental Management Committee is responsible for tracking and timely closure of audit findings and development of a database of Corrective Action Reports. MDOT’s audit program and performance measures are discussed in the respective sections of this report.

Massachusetts Highway’s EMS for Facilities Management
Mass Highway’s EMS for Facilities Management focuses on hazardous waste and hazardous materials, underground storage tank management, wetland and water quality protection, and solid waste management. System Improvement and Implementation plans are developed for each facility. Mass Highway has developed an implementation manual describing organizational roles and responsibilities relative to environmental compliance management at Mass Highway facilities. Personnel within the major Organization Offices, Divisions, Districts, and Sections that affect compliance with Mass Highway environmental requirements are identified, along with associated training programs to educate staff “how to best carry out their environmental related duties.” (33)

Facility Management in PennDOT District 10 Strategic Environmental Management Program (SEMP)
Maintenance District 10 developed Process Maps operations associated with each significant aspect of operations with a special focus on the District 10 Maintenance Facility, providing information to plan, conduct, assess, and complete activities according to “Plan-Do-Check-Act” framework and principles. Process Maps identify responsibilities associated with each action. For example, PennDOT staff developed Quality Assurance Evaluations for Maintenance Stockpiles and Foreman’s 15-Minute Stockpile Walkarounds. PennDOT implemented procedures to enhance environmental performance, including annual calibration of spreaders before the onset of the winter services season, use of two-way radios between operators during storms to communicate information about application rates and roadway temperatures, daily electronic leak detection tests in the morning hours before the day shift at garages with corrective action if necessary to prevent leaks, and completion of a Foreman’s Erosion and Sedimentation Checklist as part of planning for earth disturbance activities that require control measures.()
PennDOT’s ISO-based SEMP plan resulted in: ()

1 Development of information on contractor/supplier procedures and requirements related to significant aspects, which are consistent with department-wide contract terms and conditions, requirements, and procedures.
2 Establishment of procedures for emergency response and spill prevention.
3 Development of procedures, checklists, and responsibilities in monitoring and measurement activities related to significant aspects.
4 Internal development of auditing procedures for SEMP activities performed by trained staff from another district.
New Hampshire DOT’s Inventory of Managed Properties

New Hampshire DOT (NHDOT) developed an IMP (Inventory of Managed Properties) to inventory hazardous materials at all of the Department’s maintenance and operations facilities. NHDOT operations policy requires that all NH DOT properties be screened and all environmental concerns recorded. To address this need, NHDOT implemented a system of integrated handheld computers and web-based data management to support a contaminated property valuation policy for prospective and currently owned properties. NHDOT’s increased emphasis on inventory and risk management of all properties potentially impacted by a project or currently owned by the state greatly increased the volume of hazmat data being collected and managed. It also placed more emphasis on early detection. A robust site screening protocol was developed to collect preliminary field observations of hazmat sources and receptors. To support the protocol, the field data collection application was developed for use on personal digital assistants (PDAs). The PDA software standardizes site-screening data, improves data completeness and quality, and reduces time delays from fieldwork to data reporting. Since digital photographs and GPS data are captured using integrated hardware, and are stored directly to the database upon collection, there is no sorting, labeling, and management of this information following field work. The database is dynamically linked to the Bureau of Right-of-Way, ensuring that property information is kept accurate and redundancy of data is eliminated. Functionality built into the graphic user interface on the web calculates “risk scores” for each property and prioritizes all of the sites within a corridor, flagging key hazmat issues. The developed technology provides the NHDOT with better and faster data from the initial phases of a project; the ability to “triage” sites based on their calculated risk rankings and flags; and the capability to manage contaminated sites from identification through remediation within the web application. IMP also allowed NHDOT to easily communicate with the state’s Department of Environmental Services (NHDES). Minor incidents do not need to be reported directly to the department, as long as the occurrence is posted on the database, eliminating several sets of paperwork, which would normally need to be prepared for both NHDOT and NHDES.

This new technology has reduced the time spent on site, and standardized data collection and reporting performed by consultants. Currently, IMP is used solely in the documentation of hazardous waste inventories, remediation and issues for each of the DOT maintenance facilities throughout the state; however, it will soon be used to document stormwater management and cultural resource issues at all DOT owned sites.

In conjunction with IMP, NHDOT also developed a Risk Assessment for Site Contamination and Appraisal of Lands (RASCAL). Though developed primarily for project development and right-of-way purposes, it is also used by construction personnel to determine the status of hazardous materials cleanup at construction sites.

Facility Siting and Prioritization of Environmental Improvements

Facility Siting Considerations
Currently, future sites for DOT facilities are usually selected based on cost of land acquisition and operational convenience. Some facility sites have been acquired through “swapping” an existing DOT site for a more desirable parcel. Environmental factors are often not considered and evaluated, unless a procedure specifying such consideration is
in place and/or information has been made readily available or a study has been performed.
Information on existing DOT maintenance facilities is needed to allow identification and ranking of sites that are the most environmentally sensitive, to decide which sites to address first. Such information enables DOTs to:

1. **Prioritize sites that should be closed or relocated based on environmental concerns**, as funds become available or on a more pressing basis.
2. **Identify facilities that require pollution control devices**, such as oil/water separators or implementation of other environmental stewardship practices, and those that need to implement stormwater runoff controls.
3. **Identify environmentally appropriate locations for new facilities**, including newly-designed salt storage buildings.
4. **Develop and implement appropriate decommissioning policies or procedures.**

Many DOT maintenance facilities are currently closed and/or relocated without a decommissioning policy or procedures. This can result in abandoned areas of actual or potential contamination and/or the transfer of hazardous and non-hazardous chemicals and wastes to other DOT facilities without advanced planning and, sometimes, without advance notification.

**Environmental Data Needed for Evaluation in Facility Siting**
Consideration of the following widely available environmental data is recommended in considering facility siting and future changes that may be needed to improve environmental stewardship. Most of this data is available from state environmental quality or natural resource agencies, or a federal agency if noted: ()

1. Well log data
2. Soil borings
3. Surface water intakes and wellhead protection areas for public drinking water systems
4. High-volume groundwater users
5. Spill, Superfund, Leaking Underground Storage Tank and other contaminated sites locations of groundwater aquifers and surface water bodies (EPA)
6. Environmentally sensitive areas (e.g., parks, wetlands, reserves) (DNR, U.S. Department of Interior, U.S. Department of Agriculture). Criteria used by INDOT for identifying “sensitive waters” include those waters: ()
   - Providing habitat for species of concern; i.e. having state or federal designations of endangered, threatened, rare, extirpated or on a “watch list” identified by generic descriptor (mammal, etc.) or heritage species code.
   - Used as a public surface water supply intake; i.e. maintenance facilities are within 1,000 feet, 3,000 feet or one mile of a public water intake.
   - Used for public recreation; i.e. within a mile of such a recreation area and not connected to a POTW.
   - Classified as outstanding state resource waters or high quality waters
7. Groundwater aquifers and surface water bodies (U.S. Geological Service)
8 Locations of urban wet-weather and rural (agricultural) drainage patterns (U.S. Department of Agriculture – Natural Resources Conservation Service)

For maintenance facilities that are captured under the Municipal Separate Storm Sewer System (MS4) portion of the NPDES program, the DOT is required to assess the water quality of known receiving waters and stormwater outfall discharges and known sensitive areas, and to identify those places having a reasonable potential for causing stormwater problems. In case of the latter, DOTs are expected to implement control measures and conduct operations in ways that will reduce contamination of stormwater discharges. As a result, it is important to:

1. Identify facilities that are not currently connected to a Publicly Owned Treatment Works (POTW)
2. Attempt to connect to a POTW when new sites are developed.

Criteria for Prioritizing Attention to Maintenance Facilities

Utilizing data such as that discussed above, criteria can be developed to identify maintenance facilities that should receive priority attention. INDOT utilized the following criteria that are applicable to other states, to identify those that provide the greatest potential risk to the environment from stormwater discharge, locations both within and outside MS4 areas: ()

1. Maintenance facility locations within designated MS4 areas.
2. Maintenance facility locations within 3,000 feet of a community public well.
3. Maintenance facility locations within (1,000 feet) (3,000 feet) (5,280 feet) of a public surface water intake.
4. Maintenance facility locations within one mile of high quality and exceptional use waters.
5. Maintenance facility locations within one mile of federal, state, county, municipal or township recreation facility having a lake, pond, river, or stream.
6. Maintenance facility locations within 3,000 feet of groundwater that is highly vulnerable and very highly vulnerable to contamination by nitrates (as surrogate for chloride).
7. Maintenance facilities within 3,000 feet of a natural area containing Rare, Threatened, or Endangered species.
8. Maintenance facilities within one mile of the “best remaining examples of natural wetland communities,” as determined by IDNR.

6.2 Facility Housekeeping Practices

Daily activities occurring at maintenance facilities can involve the use of materials and products that are potentially harmful to the environment. Many DOT “yards” or “depots” are the location of aggregate piles, metal scrap piles, miscellaneous right-of-way trash, and other debris that can potentially contaminate stormwater. Stormwater runoff has the potential to come in contact with and transport sediment and other pollutants from the
facility grounds to storm drains or adjacent water bodies. Non-stormwater, from sources such as landscape watering, vehicle cleaning, water line/hydrant flushing, and air conditioning condensation, can also transport pollutants as it flows across facility grounds. Good housekeeping practices are intended to eliminate the potential for discharge of pollutants to drainage paths, stormwater drainage systems, or watercourses by promoting efficient and safe storage, use, and cleanup of potentially harmful materials. The best strategy for minimizing pollutants in discharges from the facility is to control pollutants at the source.

**General Stormwater Protection Practices at DOT Maintenance Facilities**

Stormwater and non-stormwater can be prevented from coming into contact with potential pollutants by use of the following practices, outlined by Caltrans in their bulletins for maintenance staff:

1. Cover stockpiles and other materials stored outdoors.
2. Use berms or other containment methods to prevent runoff.
3. Sweep paved areas to remove sediment and other materials that have been tracked or dispersed across the facility.
4. Ensure that paved surfaces are in good condition.
5. Prevent non-stormwater, such as condensate water from ice machines and sprinkler overspray, from flowing across facility grounds.

BMPs should be installed at storm drain inlets, catch basins and facility discharge points as final defense measures in the event preventive measures are not fully effective. Since spills and leaks may occur at any time, preparation should be in place, including the following practices:

1. Locate raw material stockpiles away from drain inlets and catch basins.
2. Do not repair, maintain, or clean vehicles and equipment near inlets.
3. Move receptacles, hazardous waste areas, raw materials storage areas, vehicle wash areas, and stockpiles away from drain inlets and areas that are prone to flooding or ponding.
4. Do not park vehicles and equipment over or immediately adjacent to inlets.
5. If a spill occurs, clean up the area immediately and dispose of cleanup materials properly.
6. Stencil drain inlet locations with paint or signs.
7. Maintain sufficient emergency materials; such as drain covers, absorbent booms, rags, or sandbags convenient to inlets.
8. To prevent flooding, place BMPs so that water will drain while retaining the pollutant on site.
9. Inspect culverts, ditches, gutters, underdrains, horizontal drains, downdrains, and outlets annually, and as needed during the rainy season, to determine if cleaning or repairs are needed. This prevents the drainage structure from becoming a pollutant source itself.
10. Collect and manage all water and material generated during drainage facility cleaning operations per solid and liquid waste management practices.

Caltrans recommends the following maintenance yard housekeeping practices in their
STATEWIDE STORMWATER QUALITY PRACTICE GUIDELINES:

1. Provide facilities for containment of any accidental losses of concentrated solutions, acids, alkalies, salts, oils, or other polluting materials.

2. Employ standard operating procedures for spill prevention and clean up during fueling operations, as well as BMPs for vehicular maintenance areas.

3. Prohibit equipment or vehicle wash waters and concrete or asphalt hydrodemolition wastewaters from flowing into stormwater run-off, except under an appropriate NPDES wastewater permit.

4. Promote recycling and manage solid waste according to the appropriate procedures or stewardship practices.

5. Minimize pesticide, herbicide and fertilizer use. Pesticides should be used, applied, handled, stored, mixed, loaded, transported, and disposed according to manufacturer’s procedure and any state requirements.

6. Use the “first in first out” policy for material storage and control. Avoid ordering more materials than can be stored properly or used in a reasonable timeframe. Properly reuse, recycle, or dispose of empty containers, excess materials, equipment, and parts that are not likely to be used.

   - Clean up spills promptly.
   - If it is necessary to use a hose for cleaning, wash water should not be discharged to the stormwater drainage systems or watercourses.

**Building and Grounds Maintenance**

Permanent maintenance facilities require building and grounds maintenance, which includes care of landscaped areas around each facility, cleaning of parking areas and pavements other than areas of industrial activity, and maintenance of the stormwater drainage system. Tasks to perform these activities include equipment operation, litter/trash pickup and maintenance of restrooms/RV dump stations and landscaping, which can in turn result in spills, leaks, trash, sewage, erosion and chemical vegetation control. Potential pollutants include litter, trash, sewage, pesticides, fuel, hydraulic fluid and oil.

Recommended environmental stewardship practices include:

1. Maintain equipment and buildings to avoid peeling paint, rust, and degradation. Request funding for major repairs.

2. Maintain clean, orderly material and equipment storage areas. Provide covers for materials as needed.

3. Sweep or vacuum maintenance facility floors and pavement.

4. If mopping is used to clean floors or pavement, contain the mop water and dispose of it to the sanitary sewer system according to the following guidelines:
   - Do not dispose of mop water into the parking lot, street, gutter or drain inlet; and
   - If an oil/water separator is available, pour the mop water into the separator so that the wastewater is treated before being discharged to the sanitary sewer system.
Minimize the possibility of stormwater pollution from outdoor 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;
- Install a low containment berm around the waste receptacle area; or
- Use and maintain drip pans under waste receptacles.

Utilize the following environmental stewardship practices to protect water quality: scheduling and planning, illegal spill discharge control, safer alternative products, vehicle and equipment fueling, vehicle and equipment maintenance, sweeping and vacuuming, silt fence, sandbag and gravel bag barrier, straw bale barrier, fiber rolls, wood mulch, compaction, spill prevention and control, solid waste management, liquid waste management, sanitary/septic waste management, hazardous waste management, concrete waste management, material delivery and storage, material use, litter and debris, potable water/irrigation, water conservation practices, maintenance facility housekeeping practices, and compaction.

**Vehicle and Equipment Maintenance**

The following stewardship practices apply to equipment maintenance:

1. Maintenance should be performed in covered or indoor maintenance areas where potential pollutants cannot be introduced into stormwater drainage systems.
2. Inspect equipment for damaged hoses and leaky gaskets and repair or replace as necessary.
3. Drip pans or absorbent materials should be used during vehicle and equipment maintenance work that involves fluids.
4. Non-stormwater discharges into stormwater drainage systems or watercourses are prohibited.
5. Utilize Spill Prevention and Control BMPs for pollution prevention and response measures. Any contaminated soil resulting from vehicle or equipment repair should be addressed.
6. Use dry methods (e.g., dry rags, vacuuming or sweeping) for cleaning associated with maintenance in outdoor areas.
7. Inspect areas following field maintenance areas to ensure there is no residual contamination that might impact stormwater quality. Clean areas as needed using dry methods, (e.g., sweeping or vacuuming).

**Pre-Operation Inspection**

Vehicles and equipment should be inspected for leaks on each day of use. When performing pre-operation inspection, pay particular attention to:
1. Ensure that the vehicle/equipment is clean and in good operating condition.
2. All equipment has current inspection stickers, as applicable.
3. Assignees and operators of motorized vehicles and equipment ensure that preventive maintenance occurs and that all malfunctions, operating problems, etc., are reported for corrective action. Request the repair of vehicles/equipment with leaks. Place a drip pan under any leaking vehicle or equipment. Preventive maintenance should occur in accordance with departmental guidance.
4. Clean up spilled or leaked fluids immediately.
5. Verify that hoses and clamps are secure and check for evidence of leaking.
6. Problematic vehicles or equipment should be removed from the maintenance activity site.
7. Daily pre-trip inspection should be logged and kept for 3 months.

**Vehicle Fluid Removal**

When removing automotive fluids such as used motor oils, coolant, or other oils from vehicles or equipment, the following environmental stewardship practices should be used:

1. Transfer removed fluid to a designated used fluid storage tank as soon as possible.
2. If possible, remove fluids directly into the holding tank. For example, newer types of used oil tanks can be connected to the vehicle to pump oil directly into the tank.
3. If necessary, drain fluids into a drip pan and then transfer the fluids to the designated container. A larger drip pan may be required to catch any unanticipated splashing.
4. Properly remove, clean, and store drip pans promptly after use.

**Engine and Parts Cleaning**

When cleaning engines and parts during vehicle and equipment repair operations, the following environmental stewardship practices should be used:

1. Designate specific areas for parts cleaning.
2. All parts washing should be performed in designated areas with captured wastewater.
3. Use self-contained sinks or tanks when working with solvents. Periodically check for leaks and make necessary repairs as soon as possible. When not in use, make sure covers are secure.
4. After rinsing parts, allow them to drain and dry over a solvent sink or tank. This will prevent dripping onto the floor.
5. All vehicles and equipment should be washed at an approved area.

**Cleaning Up Spills of Vehicle and Equipment Fluids**
Accidental releases of vehicle fluids at maintenance sites can potentially discharge into stormwater drainage systems and pollute receiving waters. Typical vehicle fluids include oil and hydraulic fluids leaking from vehicles and equipment, accidental spills from fueling operations, and leaks and spills around storage tanks and containers. Caltrans developed and distributed the following environmental stewardship practices for cleaning up spills of vehicle and equipment fluids:

Proper response to a vehicle fluid leak requires preparation:
1. Maintain up-to-date spill prevention, control, and response plans.
2. Train staff to identify and respond to spills safely and appropriately.
3. Maintain appropriate and adequate supplies of cleanup materials at fueling areas, vehicle maintenance areas, cleaning areas, and vehicle and equipment parking areas.
4. Regularly inspect vehicle parking, maintenance, cleaning, and fueling areas for leaks and spills.
5. Repair or replace vehicles and equipment that consistently leak.
6. Repair or replace, as needed, material and waste storage perimeter controls, containment structures, covers, and liners in order to contain spills and leaks.

Evaluate the spilled material to determine the appropriate methods for cleaning up the spill. Vehicle fluids such as oil, fuels, and hydraulic fluids are considered hazardous wastes and require appropriate safety precautions. For spilled material, immediately contain the material to keep it from spreading and clean it up.
1. Place absorbent materials or pads around leaks to soak up spills.
2. For vehicles/equipment that are leaking, place a drip pan underneath to contain any additional leakage.
3. Place a leaking container in appropriate spill containment or transfer the contents to another container.
4. For leaks or spills that occur during storm events, to the extent that work can be accomplished safely, cover and protect the spilled material from stormwater runoff.

Once the spilled material has been contained, ensure that all of the material and absorbent has been cleaned up.
1. Whenever possible, use “dry shop” methods to clean up spills.
2. Avoid hosing down the spill area.
3. Use an absorbent-type cloth on fuel pumps or damp mop on pavement in fueling areas.
4. If rainwater has accumulated in a contained area where a spill or leak has occurred, the contaminated water might be considered hazardous waste.
5. Take additional precautions in situations where dry cleanup methods cannot be implemented to ensure that the water used for cleaning and decontamination is prevented from entering storm drainage systems or receiving waters.
6. Dispose of the contaminated wastes (spilled material, used cleanup materials,
contaminated rainwater) according to environmental stewardship practices. Contact the DOT’s Stormwater Coordinator or HazMat Coordinator for additional assistance.

**Sediment Control at Maintenance Facilities**

Sediment on facility grounds comes from two primary sources:

1. Eroded soil from unpaved areas and slopes is transported onto the facility grounds by gravity, wind or water.
2. Mud and dirt are brought onto the facility on vehicle and equipment tires and undercarriages.

Caltrans recommended the following environmental stewardship practices in a bulletin to staff on pollution prevention at maintenance facilities.

**Evaluation of Exposed Soil Areas at Maintenance Facilities**

Regularly inspect unpaved areas of the facility for signs of erosion and identify factors in selecting appropriate stabilization measures.

1. Is the area deficient of vegetation or other conditions or practices to hold the soil in place?
2. Is the area subject to run-on, either sheet flow or concentrated flow?
3. Does the area have significant slopes that will increase the probability of erosion?
4. Is the area being used for equipment storage?
5. Do vehicles or equipment regularly utilize these areas?
6. Is the area intermittently used for storage of materials or waste?
7. Does the area show signs of erosion?

**Implementation of Appropriate Erosion and Sediment Control at the Facility**

1. Maintain existing vegetation and enhance where possible.
2. Prevent run on from adjoining areas that can cause erosion using ditches, berms, dikes, or swales, sandbag or gravel bag barriers, or fiber rolls.
3. Protect slopes, flat areas, exposed soil areas, or transportation corridors with gravel or pavement, if possible, otherwise use applicable BMPs that best fit the facilities needs, such as wood, straw or hydraulic mulch; seeding; or compaction. Well-maintained mulch provides cost-effective erosion control benefits.
4. Do not over-irrigate landscape vegetation. Ensure irrigation systems are in proper working order and not over watering or overspraying areas.
5. Inspect unpaved/disturbed soil areas regularly to assure that erosion and offsite sediment discharge is not occurring.
6. Minimize use of chemicals to eradicate vegetation from exposed areas.
7. Prevent storage of hazardous materials on exposed soil areas.

**Inspection and Cleaning**

For the most effective program to reduce sediment and raw materials in stormwater, a routine inspection and cleaning program is needed with the following elements:
1 Regularly sweep or vacuum the facility grounds to remove accumulated pollutants.

2 Regularly inspect drop inlets, facility discharge points, and facility perimeters, for accumulated pollutants. Remove pollutants and implement BMPs as indicated.

3 As indicated by the inspection, implement linear sediment barrier controls, i.e., silt fence or gravel bag barrier, etc.

4 Maintain sediment controls by removing accumulated sediment and repairing damaged areas as required by the BMPs.

5 Regularly inspect facility vehicles and equipment for dirt and mud. Ensure that vehicles are cleaned at designated washing facilities.

Materials Management at Maintenance Facilities

Maintenance facilities store a variety of products that may be harmful to the environment if they come into contact with surface waters. Materials that may be stored include pesticides, petroleum products, paints, cement and solvents, as well as bulky items such as:

1 Brush, wood, and untreated lumber

2 Treated lumber, poles, ties, including pressure treated or creosote treated

3 Scrap metal and obsolete machinery

4 Construction materials stored for reuse (culverts, steel beams, guard rail, cable, etc.)

5 Old tires, cardboard, signs, sign posts, plastic, bulky trash

6 Dirt, road sweepings, ditching material, inert fill, sand and gravel

7 Rock or stone

8 Old bricks, concrete, or asphalt

Potential pollutant sources are contaminated runoff as well as spills and leaks that may release pesticides, paint, solvents, asphaltic products, cement, epoxy resins, fuel, hydraulic fluid, and oil.

Good storage and handling practices can greatly minimize waste quantities and costs for disposal as well as reduce potential for employee exposure or environmental contamination. Environmental stewardship practices can significantly reduce handling, disposal costs, and future liability from DOT activities. Division Managers/Engineers are ultimately responsible for maintaining all Maintenance & Operations properties in good order, for minimizing the amount of material stockpiled at maintenance lots, and for ensuring that materials are stored, reused/recycled, or disposed in accordance with this procedure. Crew supervisors are responsible for ensuring that maintenance crews know and understand the procedure for storing and disposing of bulk materials.

Stockpile and Materials Management Practices and Procedures

The following items should be considered in the development of a stocking area: ()
1 **Blacktop Pad** — of sufficient size to accommodate materials storage, loading and mixing materials if required. Also add curbs on a paved swale section to channel runoff into collection basins. All bituminous surfaces should be sealed to make the surface impervious.

2 **Collection Basin** — must be properly placed for easy cleaning and effective functioning.

3 **Permanent Covered Chemical Storage Building.**

4 **Lighting** — sufficient for loading area plow mounting area, etc.

5 **Truck Heaters** — spaced in a row, not bunched on a single pole.

6 **Grading and Access Roadway Work.**

7 **Signing** — stockpile identification, Maintenance.

8 **Fencing and Security.**

9 **Planting for Environmental Screening.**

10 **Identification of Stocking Area Boundaries.**

11 **Types of Bulk Storage Buildings** — ranging from barn type buildings storing a few hundred tons of bulk chemicals to large diameter dome buildings with storage capacities over 5,000 tons.

12 **Location.** Columbia County in Wisconsin placed their new salt storage domes in a location that allowed the building of 1,800 ft of railroad-side track. This allowed bringing in the annual salt requirement by train, thus reducing the shipping cost greatly versus trucking. The cost of salt was decreased from $33 a ton to $22.34 a ton.()

Environmental stewardship practices and procedures in materials management include the following: ()

1 **Material should be recycled when possible.** When waste materials are not recycled such materials should be disposed in accordance with regulations and/or department policy.
   - Untreated wood waste and brush should be chipped and reused as mulch or fuel.
   - Scrap metal should be recycled
   - Treated wood should be reused when possible or sent to a licensed disposal facility permitted to accept this material. If new creosote treated timber is being temporarily stored for more than a week it should be covered and lined underneath with an impervious material. The liner should be bermed to catch any leachate. The leachate should be cleaned with absorbent pads that can be disposed of as oily rags. Old, used timber may be stacked without cover or liner.

1 **Develop site plans for areas adjacent to or near riparian** areas to identify erosion and sediment control needs, and to ensure stability of the material.
Sites should be identified as part of the local disposal plan.
All stockpiles should be located away from concentrated flows of stormwater, drainage courses, and inlets.
All stockpiles should be protected from stormwater run-on, using berms, dikes or other temporary diversion BMPs.

1 Maintenance facilities should appear generally clean and well organized.
2 Designate specific areas for temporary stockpiling of various types of bulk materials and wastes, such as scrap metal, brush/wood, old signs/lumber, or inert fill.
   - Signs, fencing, site plans or other markings should be used to identify stockpile areas.
   - The total bulk and waste material storage area not exceed limits specified by the DOT or state environmental agency.

1 Inspect and organize the storage areas, particularly before rainier seasons.
   - Remove litter, debris, sediment, and any spilled materials to prevent potential pollutants from being introduced into stormwater runoff.
   - Store materials away from areas that have potential for runoff into the stormwater drainage system or other watercourses.
   - Where feasible, cover materials that may have potential to impact stormwater quality during the rainy season. For materials that are frequently used, keep covers or tarps available for use during rain.
   - Frequently sweep around storage areas to remove materials blown, tracked, or washed onto surfaces that may wash off with rain.
   - Clean any spills or drips collected in secondary containment and spill containment facilities for above ground tanks and other storage/waste containers to prevent contamination of collected stormwater. Drain plugs and valves should be secure.
   - Clean vehicle wash rack sumps, clarifiers, and oil/water separators exposed to rain, as needed, to ensure free drainage and to prevent possible overflow.
   - If debris, sediment or other materials still have the potential for impacting stormwater runoff even though source controls are in place, consider installing temporary sediment controls (sand bags, straw bales, filtration socks, etc.) at inlets, stockpile areas or other sources. Make sure inlet protection will not contribute to flooding. Remember, inlet protection is intended as secondary protection only and may not be needed if source control BMPs are in place.
   - All deployed BMPs should be inspected regularly during the rainy season, particularly before and after rain events. Inspecting BMPs during rain events can be beneficial in determining their effectiveness and
identifying any needed modifications. Re-inspect inlets and drainage facilities after rain events. Clean and repair as necessary to ensure that drainage facilities are functioning properly.

- **Sediment Controls** - Inspect sediment controls such as sand bags, straw bales, silt fencing, and sediment traps and basins. Remove captured sediment from the sediment controls before the rainy season. Replace or repair degraded sand bags, straw bales, or silt fencing as necessary.

- **Drainage Facilities** - When inspecting drainage facilities take note of their condition along with the condition of any associated BMPs. If excess sediment, debris, or other potential pollutants are observed in or near the drainage facility, look upstream at the sources and consider modifying or implementing additional BMPs. If needed, implement temporary drain inlet protection.

1 Stockpiles should incorporate erosion and sedimentation controls and prevent erosion or sediment discharge into rivers, streams, ponds or wetlands. Caltrans has recommended the following stewardship practices for control of sediment from raw material storage areas.

   a. **Water quality, erosion and sediment control BMPs** should be properly implemented and regularly maintained. Interim sediment controls include using temporary sediment controls such as sand bags, straw bales, or silt fences to contain raw materials. Temporary sediment controls, such as sand bags and straw bales can degrade and may contribute to stormwater pollution. Temporary and permanent sediment controls should be inspected regularly and replaced or repaired as needed. Sediment contained by temporary or permanent controls should be removed periodically.

   b. **Wind erosion control practices** should be implemented as appropriate on all stockpiled material.

   c. In general, **stockpiles should be covered or protected** with a temporary perimeter sediment barrier at all times. Perimeter controls and covers should be repaired and/or replaced as needed to keep them functioning properly.

   d. **Berms should be installed around storage areas** to minimize tracking of materials out of storage areas and to contain sediment within the storage area. Permanent rolled berms or ramp berms should be made of hot asphalt or Portland Concrete Cement (PCC). Cold mix asphalt is not recommended for use as raw material containment berms. Over time, cold mix has the potential to break up and not function as well as hot mix asphalt or PCC. Cover raw materials (especially cold mix) during the rainy season and have covers readily available outside the rainy season when rain is predicted.

   e. **Sweep surfaces where material is tracked, blown, spilled or washed** from the storage area.
Reduce the size of stockpiles or the amount of stockpiled materials during the rainy season.

1 Material that has been contaminated with oil, gasoline or other chemicals should not be used as fill. Any material suspected of contamination should be reported promptly.

2 Environmental staff should be called for assistance with materials placement or permitting issues as needed.

3 Approved areas for filling should be marked by stakes or other markings, and appropriate erosion and sedimentation controls should be used.
   - Filled areas should be graded and stabilized by seeding and/or other appropriate methods when filling is complete.
   - Interim or seasonal stabilization should be used if filling occurs over an extended period.

1 Stockpiles of scrap metal, wood, brush, asphalt, or waste materials having no future use should be completely removed at least annually. In addition to minimizing environmental impacts, this will help avoid having the site be considered a solid waste disposal facility.

2 Obsolete equipment being stored for salvage or parts should be stored in a designated area and protected from weather, as appropriate. Fuels, oil, and fluids should be removed or properly contained to prevent spills or leaks.

3 No material should be disposed of or buried on maintenance lots, except inert fill or other authorized material (such as deer carcass composting in the case of NYSDOT). Avoid burying or disposing of:
   - Old drums or containers (see Drum Management Policy)
   - Chunks of hardened calcium chloride or sodium chloride
   - Paint, paint containers, fuels, oils, or other hazardous materials
   - Rubbish or garbage
   - Pesticides
   - Old culverts

Salt and Sand Stockpile Management
Soil and water contamination may occur around the salt sheds or sand piles if poor housekeeping practices are in place. Recommended environmental stewardship practices include the following practices compiled from Iowa DOT (), PennDOT (), NYSDOT (), Missouri DOT (), the Transportation Association of Canada (), and the Alberta, Canada Transportation Authority ():

1 All storage facilities should be inspected and repaired regularly for roof leaks, floor cracks and wall leaks.

2 All stored material is under roof, on impervious pad, in areas properly sized for truck and loader operations, stocked below fill line. Piles of salt are not
left exposed to the elements.

- **Salt and mixtures of salt and sand are kept on an impermeable surface** like asphalt or concrete and in salt storage buildings whenever possible.

- Under some circumstances, temporary (typically, less than one season) “surge” piles may be utilized if placed on an impermeable surface and covered with adequate (weighted) tarping.

- **Doors to the salt sheds and sand domes are kept closed unless salt is being delivered or removed.** Keeping the door closed ensures that the salt remains in the shed, away from snow and rain. Material must be tarped within ten feet of doorway. Maintenance staff at Iowa DOT designed and installed an innovative but basic canvas salt shed door that lifts easily, allows for full access, and provided substantial cost savings.

- **Where fabric buildings can withstand winter snows, such structures have offered one of the most cost effective methods to keep salt under cover** and provide winter storage of the mixes and other de-icing materials. Missouri DOT has found such buildings to be durable, low cost, spacious and able to be installed on a permanent or temporary foundation. Such buildings have provided storage space 2,000 to 3,000 tons, with room to work inside. Salt runoff has been eliminated at the storage sites.

- **With Bay Storage Bins and Crib Storage, the front of a barn storage bin is open and when the building is full, the salt is partially exposed.** Therefore, the following environmental protection items must be followed to guard against leaching and runoff. These environmental stewardship practices are also necessary for crib storage, to guard against leaching and runoff, as crib storage is not roofed:
  - The **bituminous pad on which the building is placed must extend for a distance of 20 feet past the front of the building.**
  - The **building is not to be overloaded so that salt spills out** past the front of the building.
  - When fully loaded, the **front of the salt pile is to be covered by tarpaulins.**
  - A **sedimentation basin must be constructed to collect runoff.**
  - The **immediate area around the building is to be kept clean of salt spillage** that will normally occur when loading the building with trucks. This is especially important for the pad surface in front of the building.

1. **The area must be properly signed.**

2. Liquid De-Icer (Magnesium Chloride, Calcium Chloride and/or IceBan/MAGic, etc., which are not included under the Chemical Bulk Storage regulations) is
stored in aboveground storage tanks (typically 3,000 - 5,000 gallon).

3 Liquid De-Icer storage tanks are located on level compacted sand bases and protected from traffic by barriers (i.e., ballards, guiderail, etc.). A basic rule of thumb to determine storage needs is 1.5 times total lane miles to treat x recommended gallons per lane mile = amount of storage (ex: 1.5 x 200 x 50 = 1,500). Iowa DOT normally purchases 2500 gallon storage tanks because their cost per gallon is considerably less than other storage tanks. Other size tanks are available for limited space needs.

4 Area drainage is such that any spills can be contained on site.

5 Placards or stenciled lettering are used to identify liquid de-icer tank contents.

6 Drains must be closed.

7 A minimum of two Stockpile Quality Assurance Evaluations should be completed per year by District Offices, one in summer and one in winter. QA is performed by Central Office. Each item receiving a score of 3 or less requires a Correction Action Report (CAR) to be completed and entered into a District tracking system to assure improvement is made.

8 A “Stockpile Snapshot” is a cursory stockpile review that can be completed by anyone from the District Office. Any deficiency noted should be addressed within two weeks. A Foreman’s Stockpile Checklist is completed by the assigned stockpile Foreman four times per year and reviewed. A copy is sent to the District Office Maintenance Unit and the Facility Administrator. PennDOT awards Silver and Gold Awards to County Maintenance Organizations for Model Stockpiles meeting certain criteria. If all five are met, a Gold Award is given. If four are met a Silver Award is bestowed. An award for “Most improved” is given as well.

9 Spills are cleaned up immediately, using necessary equipment.

10 If salty water from the stockpile is caught in a holding pond, the pond must be able to contain the amount of water from the next normal storm. It should be pumped down to ensure that this level can be maintained. The pond water levels should be monitored and excess salt water should be disposed of in an approved location.

11 Any contractor activities at government-owned facilities should be monitored to ensure that they are following the operating plan for that facility.

12 Operating plans should be developed by maintenance staff and the contractor, if appropriate, in conjunction with DOT environmental staff.

*PennDOT Salt Stockpile Management, Stockpile Academy, and Quality Assurance Program*

PennDOT provides winter materials storage, runoff control, training and quality assurance, with a high emphasis on stockpile management. PennDOT’s Model Facilities Task Force (MFTF), comprised of various representatives from Facilities Management
Division of the Bureau of Office Services, Bureau of Maintenance & Operations, Bureau of Environmental Quality, Engineering Districts and County Maintenance organizations, indicated a need for PennDOT to reemphasize stockpile management after finding safety deficiencies, improper handling and storage of materials, environmental remedial costs, building damage, and failure to update and implement Preparedness, Prevention & Contingency (PPC) plans.

Now, a District-approved, stockpile-specific PPC plan is displayed unobstructed in the staging building and is revised annually. PennDOT uses a 50 element QA review, each tied into a department policy or regulation or a PennDEQ regulation. PennDOT has developed a Stockpile Academy Training Program, which maintenance staff are required to attend on a 4-year rotating basis.

PennDOT inventories winter materials and transfers all environmentally sensitive materials to permanent material storage buildings should begin, starting with any stockpiles located within 500 feet of any wells or streams. PennDOT is moving toward the goal of every county having all salt under roofed storage from May to October. Bins and storage buildings, collection basins, and storage pads are cleaned and repaired in the spring. Prompt spring clean up of anti-skid materials prevents clogging of drains and impairment of surface waters and habitats.

PennDOT requires ongoing evaluation stockpile housekeeping measures, including a list of quality assurance responsibilities, which is included in the Appendix.

The procedure for this checklist includes:

1. Completing the checklist for each stockpile by November 30, January 31, March 31 and June 30 of each year.
2. The completed checklists are forwarded to the responsible Assistant Maintenance Manager for their review and signature.
3. The Assistant Maintenance Manager forwards the signed checklist to the County Maintenance Manager.
4. Within ten days of the completed checklist date the County Maintenance Manager forwards all Stockpile Checklists for his/her county to the Assistant District Engineer/Administrator-Maintenance (ADEM/ADAM) and the District Facilities Administrator (FA).
5. The FA will determine appropriate corrective action in cooperation with the ADE/A-M, the County Maintenance Manager, Equipment Manager and Assistant Maintenance Managers.

PennDOT makes use of the following quality assurance evaluation indicators for solid winter materials stockpiles:

1. Any salt, mixed or treated material not under roof or tarped and anchored with sand bags; or not on an impervious pad.
2. Any bagged deicing chemicals not stored on pallets and either under roof or 100 percent covered by tarps and anchored with sand bags.
3. All salt, mixed or treated material stored under roof or on an impervious pad, tarp covered and anchored with sand bags. Note: Tarp and sand bags are not required during general snow and ice control operations. Bagged deicing chemicals stored
on pallets and 100 percent covered by tarps and anchored with sand bags.

4 All salt, mixed or treated material stored under roof, on an impervious pad, below building fill line, and tarp covered and anchored with sand bags. Note: If face of material is more than ten feet from the building doorway, no tarp is required.

5 Bagged deicing chemicals stored on pallets and 100 percent covered by tarps and anchored with sand bags.

6 All salt, mixed or treated material is stored under roof, on an impervious pad, and below building fill line, and tarp covered and anchored with sand bags. Note: If face of material is more than ten feet from the building doorway no tarp is required. Bagged deicing chemicals stored under roof, on pallets.

As a result of their system, PennDOT has been able to work with PennDEP to have one permit per district with an EMS in place, rather than one permit per stockpile. PennDOT is not required to sample because an EMS and BMPs are in place and salt is stored under cover. Finding covered loading was not considered necessary because loading areas are paved, curbed, and contained.

PennDOT developed the 15-minute Stockpile Walkaround to be performed by the Maintenance Foreman, along with a shorter Stockpile Snapshot as shown in the Appendix. Maintenance stockpile activities have been charted in a Stockpile Activity Protocol Matrix, also listed in the Appendix.

**Material Delivery and Storage**

Material delivery and storage procedures and practices are designed for the proper handling and storage of materials at the maintenance facility. Such materials may include aggregate, pesticides, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, hazardous chemicals, concrete compounds, or other materials that may be detrimental if released to stormwater drainage systems or watercourses.

The following procedures and practices minimize or eliminate the discharge of these materials to stormwater drainage systems or waters of the state.

1. During the initial stocking and following deliveries, special care should be taken to load and pile all solid materials in the approved manner and keep storage locations neat and orderly.
2. Store drums in protected (dry) and temperature-compatible manner. Do not store materials that can freeze in unheated areas.
3. Containment facilities should provide for a spill containment volume equal to 110 percent of the largest container in the facility.
4. Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled.
5. Containers and drums should be placed in temporary containment facilities for storage. A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 24-hour, 25-year storm event.
6. Containment facilities should be impervious to the materials stored there and maintained free of rainwater and spills.
7. Rainwater in containment facilities should be inspected prior to discharge. In the
event of soil spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines to be non-hazardous. Nonhazardous liquids should be sent to an approved disposal site.

8 Repair and/or replace perimeter controls, containment structures and covers as needed to keep them functioning properly.

Proper Handling and Use
1 Personnel at maintenance facilities should be trained to ensure that materials are properly handled and stored.
2 Use recycled and less hazardous products when practical, reducing or eliminating use of hazardous materials on-site when practical. Substitute a less hazardous or less waste-producing product or process for those that would otherwise have generated a more hazardous or higher quantity of wastes. As well as potentially resulting in a non-hazardous waste for an indicated activity, such substitution may reduce or eliminate potential employee exposure concerns and additional regulatory burden.
3 Use materials only where and when needed to complete the necessary maintenance or construction activity.
4 Recycle residual paints, solvents, non-treated lumber, and other materials.
5 Do not over-apply fertilizers and pesticides. Prepare only the amount needed. Follow strictly the recommended usage instructions. Apply surface dressings in smaller applications, as opposed to one large application, to allow time for them to work in and to avoid excess materials being carried off-site by runoff.
6 Do not apply fertilizers and pesticides to plants that are used by people for food, medicines, basketmaking, and other purposes. Many Native American communities and some other groups (e.g. African-American basketmakers in coastal South Carolina, some Asian-American groups) use roadside plants for such purposes, and may be harmed by the application of fertilizers and pesticides. Consult with such groups to establish where chemicals should not be applied.
7 Identify container contents and maintain data on its contents. Do not remove the original product label from a container, as it contains important safety and disposal information.
8 Keep products in their original containers whenever possible.
9 Use all of the product before disposing of the container.
10 Label any unmarked containers with permanent markers; include the date when filling first occurred.
11 Keep a record of what is stored in each container.
12 Retain the material safety data sheets (MSDS) for each product.
13 Record any information that relates to a waste, such as “also contains some water” or what activity the waste resulted from, such as “Safe-Strip cleaning solvent from epoxy pavement marking activities.”
14 Whenever possible, return unused products to the supplier.
15 Never mix dissimilar materials and wastes in the same containers.
16 Drain valves should remain closed except to release clean rainwater.

17 Separation should be provided between stored containers to allow for spill cleanup and emergency response cleanup.

18 Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.

19 To provide protection from rain, bagged and boxed materials stored outdoors should be stored on pallets throughout the rainy season.

20 To provide protection from rain, bagged and boxed materials should be covered prior to rain events.

21 Storage areas should be kept clean, well organized and equipped with cleanup supplies for the materials being stored. Perimeter controls, containment structures, covers and liners should be repaired or replaced as needed.

22 Check to ensure that designated storage areas are kept clean and well organized.

23 Dispose of wastes or empty containers regularly.

24 Dispose of waste before knowledge of their contents is lost and before deterioration occurs.

25 Keep an inventory of the waste on hand and contact environmental staff to set up disposal contracts for both hazardous and non-hazardous wastes.

26 Dispose of empty containers promptly before water or other contamination or deterioration occurs.

27 Avoid pollution from oil, paint, solvents, diesel, lead-acid batteries, fuel, hydraulic fluid and oil through use of water quality BMPs such as scheduling and planning, vehicle and equipment fueling, vehicle and equipment maintenance, hazardous waste management, material delivery and storage and spill prevention and control.

28 Latex paint and paint cans, used brushes, rags, absorbent materials and drop cloths, when thoroughly dry and no longer hazardous, may be disposed of with other construction debris.

29 Mix paint indoors or in a containment area. Never clean paint brushes or rinse paint containers into a street, gutter, storm drain or watercourse. Dispose of any paint, thinners, residue or sludges that cannot be recycled as hazardous waste.

30 For water-based paints, paint out brushes to the extent practical and rinse to a drain leading to a sanitary sewer, where permitted or into a concrete washout pit or temporary sediment trap. For oil-based paints, paint out brushes to the extent practical and filter and reuse thinners and solvents.

31 Keep an ample supply of spill cleanup material near material use areas. Train employees in spill cleanup procedures.

32 Spot-check employees and subcontractors throughout the duration of the job to ensure appropriate practices are being implemented.

Waste Management
Waste management is governed by both federal and state requirements which include Federal hazardous waste management regulations developed under the Federal Resource Conservation and Recovery Act (RCRA), state-level waste management regulations, and regulations developed under other statutes that apply to wastewater discharges and air emissions. DOTs practice stewardship by complying federal and state waste management regulations and taking measures to reduce or eliminate waste streams, in order to reduce the present and future threat to human health and the environment. PennDOT practices the following hierarchy for waste management decisionmaking:

1. First, consider REDUCTION — activities that reduce or eliminate the generation of hazardous wastes. Waste reduction may include the following benefits:
   - Lower Operating Costs From The Substitution Of Less Expensive Raw Materials.
   - Lower Energy Costs Through The Use Of Newer, More Efficient Equipment.
   - Reduced Transportation And Disposal Costs.
   - Improved Product Quality.
   - Reduced Long-Term Liability Associated With Handling And Disposal Of Hazardous Wastes.
   - Enhanced Employee Safety From Reduced Exposure To Hazardous Materials.
   - Cost Savings From The Reuse Of Materials.
   - Revenues From The Sale Of Surplus Materials.
   - Fewer Regulatory Compliance Requirements.
   - Improved Public Image-The Less Wastes Produced, The Less The Department Is Viewed As A Contributor to environmental problems.

2. Second, consider RECYCLING — the use, reuse, or reclamation of wastes either on-site or off-site after they are generated.

3. Third, consider beneficially using wastes for ENERGY RECOVERY. Some specific wastes can be beneficially used as a fuel under carefully controlled conditions to recover their energy value.

4. Fourth, consider off-site TREATMENT to reduce the toxicity of hazardous wastes.

5. Finally, consider LAND DISPOSAL.

NYSDOT’s “Solid and Hazardous Waste Reduction Policy” outlines policies and procedures to reduce its wastes, including the following: ()

1) Recycling - NYSDOT engages in agency-wide programs to recycle such waste materials as used antifreeze and vehicle batteries.
2) Reuse - Whenever possible, NYSDOT reuses asphalt and concrete pavements as a substitute for crushed stone in subbase and other engineering applications.
3) Waste to energy - NYSDOT routinely collects used motor oil and compatible hydraulic fluids that are burned for fuels or space heating.
Standard operating practices that include good housekeeping are the simplest ways to reduce wastes. Other methods to reduce wastes include substituting materials; recycling and reuse; and participating in waste exchanges.

**Waste Determination**

The requirements for handling and disposal vary significantly for the different categories of wastes. A determination of whether a waste is a hazardous waste should be conducted for all wastes that could possibly be hazardous wastes. The definition of hazardous wastes is found in Title 40 of the U.S. Code of Federal Regulations (CFR) Section 261.3. By definition, wastes are hazardous if they are 1) listed (specifically named) or 2) if they exhibit any of four hazardous waste characteristics (ignitability, corrosivity, reactivity, or toxicity).

The hazardous waste determination may be conducted by using the following:

1. Generator’s knowledge of the waste and/or testing.
2. The product’s Material Safety Data Sheet (MSDS) or product label, which should indicate if an unused product would be a hazardous waste.
3. Information such as ingredients, flash point, pH and disposal requirements.

Testing may be required to determine whether particular wastes are hazardous. Wastes generated by Department maintenance operations which may be classified as hazardous wastes, depending on test results, include: waste paint filters, used antifreeze, used caustic solutions, waste pesticides, spent paint abrasives, waste paints, spent solvents, waste motor oil, old batteries, shop rags, waste asphalt emulsions, or waste inks.

DOTs must determine if the waste is a “listed waste” and/or has a “hazardous waste characteristic.” Wastes that have certain “characteristics” (ignitability; corrosivity; reactivity; and/or toxicity) are hazardous wastes regardless of their origin. Toxic constituents can be released or leach out upon disposal, as measured by a test termed the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP is an analytical test, which determines the potential of a toxic constituent (currently 40 constituents: metal, pesticide, and organic chemicals) to “leach” and become mobile and contaminate groundwater/waters upon disposal. Metals such as lead and chromium, and possibly benzene (a volatile organic) are the constituents on the TCLP list that most frequently are present in DOT wastes. Lead based paint waste, with the characteristic of toxicity, removed from bridges is one of a DOT’s most frequently generated hazardous wastes, see Section 7.3.

DOTs must also consider the contaminants and/or changes to the material that could have been introduced during its use. This type of contamination may not be easily predicted by generators knowledge and may require testing of the typical waste product. Examples could include metal contamination in waste oils, degreasing solvent, or antifreeze that could be added during the vehicle operation that were not present in the virgin product.

Hazardous waste generators must determine how much hazardous waste they generate and maintain records to document the amounts. Most maintenance facilities maintain Small Quantity Generator (SQG) status for Maintenance and Operations facilities by generating less than 220 pounds (100 kg) or about ½ of a 55-gallon drum) of hazardous waste in any one month, or (b) stores less than 55-gallons of hazardous waste at any one time. If the above noted waste generation limits are exceeded, then the facility must comply with regulations for either a Small Quantity Generator Plus (SQG-Plus) or a
Large Quantity Generator (LQG). State DOTs should consult with regulations and procedures particular to the state and agency. General environmental stewardship practices include:

- Hazardous waste should be placed in the proper container/drum.
- All hazardous waste containers should be labeled with the words “Hazardous Waste” and the specific contents or words describing the waste.
- The hazardous waste container label should include the date when waste was first put in the drum and the date when the drum becomes full.

1. Drums should be inspected at least weekly while stored on site.

2. Arrange for off-site shipment of each full container of hazardous waste within 30 days of filling. Waste should be shipped by a permitted waste transporter with a hazardous waste manifest and disposed of at a permitted treatment/disposal facility for hazardous wastes. Waste should be removed within 90 days for LQGs and 180 days (270 days if it must be shipped more than 200 miles) for SQG.

- Maintain manifests of hazardous waste transport.
- Report spills or leaks of hazardous waste to the State Police or regulatory agency.
- DOTs should provide training at least once to all employees who handle or have responsibility for managing universal wastes on proper handling and emergency procedures and ensure that documentation of training is maintained. Training records should be kept for a minimum of three years or for the length of employment, whichever is longer, and cover the name of the person receiving the training, the date of the training and the information covered during the training. A copy of the documentation should be sent to the DOT’s central training office.

- Limitations on storing hazardous wastes at the facility’s central accumulation area are dependent upon the quantity of wastes generated, with different regulations for small and large generators.
- Maintenance facilities should never exceed these time and quantity accumulation limits; otherwise the facility will be considered a Treatment, Storage, and Disposal Facility (TSDF) and be subject to extensive additional RCRA regulatory requirements.

**Hazardous Waste Management Practices**

Each DOT should follow guidelines and practices developed by their state and agency specialists. Environmental stewardship practices include:

**Container Storage**

Best practices for storage include containers:

1. In good condition.
2. Compatible with the wastes contained in them.
3. Opened only to add or remove wastes.
4 Separated from other containers holding different wastes which could cause
dangerous chemical reactions.
5 In compliance with container requirements for shipping wastes off-site.
6 Marked with the date accumulation begins and with each subsequent date waste is
placed in the container labeled with the words “hazardous wastes”.
7 Segregated by waste type and clearly marked to identify their contents.
8 Kept within a secured area permitting access by authorized personnel only.
9 Recorded in a running log of wastes accumulated in each container.
10 Inspected for leaks and container deterioration weekly with the inspection results
recorded.

*Storage Area Practices*
1 Reactive or ignitable wastes located at least 50 feet from the facility property line.
2 Wastes with flashpoints under 100°F located at least 60 feet from any
adjoining buildings or property lines.
3 Incompatible wastes segregated.
4 A base and dike capable of containing leaks, spills, and accumulated rainfall.
5 Adequate containment capacity necessary to hold a spill amounting to the volume
of the largest container, or ten percent of the total volume of all containers,
whichever is greater, plus a reasonable amount for precipitation.
6 Adequate space around containers to ensure access in the event of a spill or
emergency.
7 Proper emergency equipment, as needed, such as alarms, telephones, or fire
extinguishers.
8 A design consistent with department publication 284 titled “handbook for
acquisition, development, and maintenance of the model stockpile”.
9 Spill and leak response measures incorporated in the PPC Plan.
10 Storage of hazardous wastes in aboveground storage areas is preferred. Wastes
generated by parties other than the DOT are stored at DOT maintenance facilities
rights of- way unless approved by the district maintenance engineer.

*Packaging*
Best practices for hazardous waste packaging and transport include: ()
1 Packages meet the USDOT or UN specifications for the wastes.
2 Packages are sufficiently tight to prevent releases of materials.
3 Mixing of reactive or combustible gases is prevented.
4 Packages adequately closed.
5 Liquid containers should have sufficient free space above the liquid to
accommodate expansion of the liquid to 130 degrees Fahrenheit.

Product containers may be reused once for shipping wastes if the product containers:
1 Are acceptable USDOT or UN specification drums for the wastes.
2 Are in good condition and free of rust, damage, or leaks.
3 Do not contain any incompatible residues.
4 Do not carry any old marking labels that incorrectly identify the contents.
5 Reused containers must be thoroughly cleaned to avoid combining incompatible wastes producing toxic vapors or explosions as well as waste mixtures that are even more dangerous than the individual wastes.
6 Small items may be packaged in drums which are commonly referred to as lab packs. In general, lab packs should be packaged as noted below. The specific packaging requirements should be reviewed with the disposal contractor.
7 Outside packaging should be an USDOT specification metal or fiber drum with a removable head.
8 Drum construction should be compatible with the materials being packaged.
9 Outside packaging should contain only one hazard class.
10 Inside packaging may be one or more glass packagings not exceeding one gallon, or one or more metal or plastic packagings not exceeding five gallons. and
11 Inside packaging of liquid should be surrounded by compatible absorbent material capable of absorbing the total liquid contents.

Marking
All containers used to ship hazardous wastes should exhibit a USDOT hazardous waste marking completed with waterproof ink and showing:
1 The proper USDOT shipping name of the waste.
2 The UN or NA number.
3 Generator information including name, address, and EPA ID number.
4 The EPA waste number.
5 The accumulation start date. and
6 The manifest document number.

Labeling
All containers used to ship hazardous wastes should exhibit a USDOT hazardous waste label and may require an USDOT shipping label if it meets a hazard class definition.

Manifesting
A hazardous waste manifest is a multicopy shipping document that is filled out and accompanies all hazardous waste shipments. Hazardous waste manifests are designed to track shipments from the point of generation to their final destination. All generators, except conditionally exempt small quantity generators, must use manifests to ship their hazardous waste.
1 The hazardous waste manifest should be completed before shipping hazardous wastes. The manifest becomes the written record of the hazardous waste disposal. Upon shipment, forward a copy of the manifest to both the state of generation and the state of destination and retain a copy. A copy of the signed receipt manifest must be returned by the disposal facility to the generator state, disposal state and the generator.
2 Copies of the manifest that are signed and returned by the treatment or disposal facility are maintained on file for five years for small quantity generators and twenty years for large quantity generators.

3 If a copy of the signed manifest is not received from the waste facility within 35 calendar days, the transporter and waste facility should be contacted to determine the status of the shipment and the state/environmental agency notified of the status.

4 An exception report may be required for wastes not received after 45 days. Manifests may not be required when reclamation of the material is occurring but as a best practice the DOT may want to manifest all hazardous waste shipments because it simplifies record keeping and reporting.

Shipping
A licensed disposal contractor should provide the following services:

1 Contract with a facility authorized by the EPA or the state permitting agency to treat or dispose of hazardous wastes.

2 Package and label the wastes and prepare the manifest. - prepare a hazardous waste characterization report.

3 Prepare a land band notification advising the treatment or disposal site of the standard to which the hazardous wastes should be treated. and

4 Transport the hazardous wastes to the treatment or disposal facility.

Verify that the wastes were received at the waste facility by reviewing the signed manifest received from the waste facility. Liability does not end when hazardous wastes have been shipped and are no longer in the Department’s possession. The Department is liable for any mismanagement of its wastes, at the current time and in the future.

Inventory and Record Keeping
Maintaining hazardous waste records is a very important part of regulatory compliance. Good record keeping proves operating compliance and may avoid problems with regulatory agencies and minimize future cleanup liabilities. Facilities judged out of compliance face legal and enforced actions, fines, and bad publicity. The following minimum records should be maintained by small quantity generators for a minimum of five years.

1 Test results or waste analyses made to determine if wastes generated are hazardous.

2 Monthly summaries of wastes generated which substantiate the generator category.

3 This summary should indicate the final disposition of the wastes, including those not manifested.

4 On-site waste accumulation records, including the date accumulation began and the quantity accumulated to date.

5 In-house inspections, including deficiencies noted and when such deficiencies were resolved.

6 Records of employee training.

7 Generator’s copies of the manifests and those returned from the destination
facilities.

8 Copies of land ban notifications.
9 Copies of reclaiming contracts.
10 Spill or leak reports.

Large quantity generators should maintain the above records and copies of quarterly reports, biennial reports, and exception reports for a minimum of twenty years.

In addition some DOTs have established Safety Coordinator positions, which with they have charged the following responsibilities:

1 Ensure that an inventory of all hazardous chemicals is completed annually, including the product/chemical name, type of container, volume, and location of the hazardous chemicals. The Division Safety Coordinator should confirm that a current MSDS is on file for all chemicals in the inventory. Where applicable, the inventory should include Reportable Quantities for CERCLA hazardous materials and Extremely Hazardous Substances (refer to 40 CFR 302.4 and 40 CFR 355 for Reportable Quantities).

2 Update inventory reports between annual inventories following any significant change in status (e.g., removal of a tank).

3 Maintain a MSDS for each hazardous chemicals used or stored in each M&O facility, and should ensure that copies of MSDS are kept at each location where chemicals are used. MSDS are to be readily available to employees, so that an employee should be able to find the appropriate MSDS within 5 minutes. MSDS must contain information about the chemical including:
   - Chemical product
   - Exposure controls and company identification personal protection
   - Composition, information or ingredients properties
   - Physical and chemical
   - Hazard identification
   - Stability and reactivity
   - First aid measures
   - Toxicological information
   - Fire-fighting measures
   - Ecological (environmental)
   - Accidental release measures information
   - Handling and storage
   - Disposal considerations
   - Transport information

- Based on the annual inventory, the Division Safety Coordinator should create a list of all hazardous chemicals that exceed 10,000 lbs., or Extremely Hazardous Substances (EHS) that exceed 500 lbs. or certain Threshold Planning Quantities (refer to 40 CFR Part 370.20 and 355). This list, hereafter referred to as the “Reportable List” should be provided to the MTS Petroleum and Hazardous Waste Management Superintendent and the Division Manager/Engineer.
Petroleum products, such as diesel fuel or motor oil, are typically the only hazardous materials used by M&O in the quantities described above; 10,000 pounds equals about 1,500 gallons. M&O does not routinely use Extremely Hazardous Substances at its facilities (e.g., sulfuric acid, chlorine, formaldehyde and phenol).

- In order to comply with EPA SARA 311 and 312 reporting requirements, the Petroleum and Waste Management Superintendent should complete the following for each chemical on the Reportable List:
  - Submit a copy of the state Chemical Inventory Reporting Form and MSDS for each chemical to the local fire department, the Local Emergency Planning Committee and Maine Emergency Management Agency;
  - Pay chemical inventory and facility registration fees by March 1st and October 1st, respectively to the Maine Emergency Management Agency; and
  - Update chemical inventory reports within 90 days of a significant change in chemical inventory status (e.g., adding new chemicals).

Non-Hazardous Industrial Wastes
Some wastes, that do not meet any criteria for definition as a hazardous waste, but result from work activities are considered industrial-commercial wastes and may be disposed at municipal/commercial disposal facilities, similar to routine nonhazardous solid waste, at recycling facilities and at specialized facilities for that type of waste. Shipment, however, requires transport by permitted waste transporters, if transported in greater than exempt quantities (500 pounds/shipment). Such waste includes used tires; non-hazardous used oil, non-hazardous waste antifreeze; other waste vehicular fluids and filters that do not meet the criteria of hazardous waste; unused products containing chemicals (that are not hazardous wastes); and empty drums/containers for disposal, not recycling

Permitted C&D landfills can usually accept the following types of wastes:
1. Uncontaminated bricks, glass, asphaltic pavement, concrete and masonry materials.
2. (Pavement containing routine intact traffic markings or that has come into contact with petroleum products through normal vehicle use of the roadway are considered clean)
3. Uncontaminated soil, rock and land clearing debris
4. Wood and wood products
5. Wall coverings, plaster and drywall
6. Plumbing fixtures, electrical wiring and components containing no hazardous liquids, non-asbestos insulation, plastics that are not sealed in a manner that conceals other wastes, roofing shingles and other roof coverings
7. Empty buckets and containers (ten gallons or less) with less than one inch of residue in the bottom
8. Pipes or metal that are attached to or embedded in these waste materials

Non-Hazardous Solid Wastes
Routine garbage, office trash, and most litter collection are considered non-hazardous wastes. Most of the adopt-a-highway trash, excluding tires and other items that are industrial or possibly hazardous wastes, are non-hazardous solid wastes. These wastes should be sent to municipal or commercial landfills or trash burning plants, and no special haulers or manifests are needed.

**Specialty Waste Disposal Procedures**

Specialty wastes include hazardous wastes, chemical products (including partially-used products), and/or other materials that are not disposed of by routine trash collection and require a special waste contract for disposal. Disposing of specialty wastes is generally a two-step process:

1. **Identify specialty wastes and if necessary perform laboratory testing** - Known unused materials with sufficient information on their characteristics from material safety data sheets (MSDSs) or other information sources can be identified adequately for disposal. Examples include unused containers of toluene or paint with labels intact and MSDSs available. Sufficient information may also be available to identify used materials of known characteristics such as antifreeze where the waste had previously been tested and the process generating the waste has not changed; or fluorescent bulbs which are known to be hazardous due to mercury content. For waste of unknown or uncertain identity or where contamination could be added at unknown levels to the material upon use, testing may be required to adequately identify the waste for disposal. The DOT has contracts with analytical laboratories and standard procedures for confirming suspected drum contents. The contracts with these labs are designed to characterize wastes for disposal and will meet regulatory standards without adding unnecessary testing. Call the Regional Maintenance Office or the Environmental Specialist for assistance in inventorying, identifying and testing materials for disposal.

2. **Specialty waste disposal contracts** - A specialty waste disposal contract can be developed for the removal and disposal of the specialty wastes as identified on the inventory. The contracts should include MSDSs and analytical results to assist the contractor in providing proper handling, record-keeping and disposal of the wastes. It is generally most cost-effective to arrange for disposal of all waste materials within a DOT Region at one time, but smaller or periodic disposal contracts may be required if storage time limits or storage space are issues. See the DOT’s procedures for Storing and Handling Products and Wastes (Waste storage time limits and inspections).

**Specific Guidance for Certain Waste Management Issues**

NYSDOT, PennDOT, and Maine DOT guidance for specific waste management issues is included below:

*Abrasives*

Spent abrasives from construction projects should not be stored at maintenance facilities.

*Aerosol Cans*

1. **Disposal:** Empty aerosol cans may be thrown in the regular trash or thrown in the
metal recycle bin. Aerosol cans are empty when product can no longer be sprayed out from them. This does not include cans that have product but do not function.

2 Aerosol cans that are broken, clogged or otherwise unusable must be disposed of as hazardous waste. They must be stored in a small container with a lid that closes tightly and a hazardous waste label that includes a start date and identification of the waste as aerosol cans. The container should be stored in the same area as other hazardous wastes (if there is a drum at the facility), and should be transported at the same time when regular hazardous waste pickups occur. The small container may be any 5-gallon pail or bucket with a lid that closes. Labels should be provided by the Petroleum/Waste Management Superintendent.

3 Aerosol cans with contents no longer usable or needed must also be disposed of as hazardous waste OR the contents may be exhausted into the 30 gallon hazardous waste drum, and the empty aerosol can may be thrown into the regular trash or metal recycling bin.

Antifreeze (Coolants)
New antifreeze would not be a listed hazardous waste or fail any characteristic for hazardous waste. However, any contaminants such as chlorinated solvents, benzene, or metals that could be introduced during use must be considered to determine if the waste antifreeze could be a hazardous waste. Generator knowledge and/or representative testing of the typical waste is required to determine if it is classified as hazardous waste. Used antifreeze should be collected in dedicated drums or tanks and clearly labeled. Disposal should preferably be by a commercial recycler who will reclaim the material.

Used Antifreeze
Used antifreeze should be collected in drums that are clearly labeled as containing “Used Antifreeze.” Drums should be kept tightly closed when material is not being transferred in or out; funnels should not be kept in tank openings when not in use. Used antifreeze should be collected and recycled by the DOT.

Asbestos
Asbestos is a mineral that breaks up into very small fibers and was used for many years in making fireproofings, roofing, siding, flooring, ceiling tile and others building products. Only certified asbestos handlers can disturb, remove or package for disposal any asbestos-containing material. Any renovations or demolitions involving buildings, bridges, and utility lines that could contain asbestos must be evaluated by a certified asbestos handler. Hauling of friable (able to flake) asbestos waste requires a waste transporter permit, manifesting and waste disposal at special landfills. (Non-friable asbestos, however, may be transported and disposed of as C&D waste). OSHA requires a visual inspection to identify materials that may contain asbestos, for future reference. If this inspection has not been performed at the facility, or if there is the possibility of finding asbestos waste along the ROW, contact the DOT environmental specialist for help and further instructions and see the DOT safety guidance.

Ballasts (PCBs)
Some older fluorescent lamp (light) fixtures have ballasts that contain an oily insulating
liquid that contains PCBs (Polychlorinated biphenyls) which must be disposed of as a PCB hazardous waste. PCB-free dielectric oil contained in newer ballasts can be handled and disposed of as used oil. Assume the ballast contains PCBs unless it is marked “does not contain PCBs”. The ballasts can be disposed of using specialty waste contracts or by using the Office of General Services contracts for disposal of lighting wastes from state facilities. The ballast should be separated from the lampbulb and disposed of separately. (See “Fluorescent Bulbs” for bulb disposal).

**Batteries**

Requirements vary for batteries dependant upon their type and content and may require specialty recycling or disposal due to metal content or corrosivity. The federal Battery Act of 1996 required the phase out of mercury in alkaline batteries and required the development of recycling programs for nickel cadmium, lead and certain other batteries. Review the information marked on the battery or provided with it, and, unless supplier information indicates otherwise, handle by the following general guidelines:

- **Lead Acid Batteries**: Typically vehicle batteries and small sealed batteries in electronic equipment, contain acid liquid and lead and must be recycled or disposed as hazardous waste. NYS law requires retailers/distributers to accept used automotive/truck/RV batteries back for recycling at no charge (two per month maximum without new battery purchase). Turn in the old batteries when new batteries are installed. Licensed waste transporter, manifesting of shipment, or inclusion of the battery quantities in site hazardous waste generation amounts and generator status calculations are not required.

- **Nickel-Cadmium rechargeable batteries** must be recycled or managed under the “Universal Waste Rule”. The Rechargeable Battery Recycling Corporation (RBRC) at 800-8-BATTERY can provide assistance in recycling; alternatively, specialty waste disposal contracts could include the recycling of these batteries in their requirements.

- **Nickel Metal Hydride batteries** are not specifically required to be, but should also be similarly recycled. Silver Oxide and formerly available Mercuric Oxide batteries must also be recycled or disposed of as hazardous waste due to silver or mercury content, respectively.

- **Alkaline batteries and carbon-zinc batteries** are now made with no intentionally added mercury and are considered acceptable for disposal as routine municipal waste.

- **Used lead acid batteries** that have no cracks should be stored in a designated area, protected from the elements, with primary and emergency containment constructed of impervious material, and segregated from non-compatible materials and wastes. Used lead acid batteries should be disposed of within ninety days, but should be disposed of within one year. Lead acid batteries that have cracks are a hazardous waste.

**Brush and Tree (Clearing and Grubbing) Waste**

Chip and mulch, convert to compost if possible. Last choice is disposal as (C&D Debris - Exempt C&D)”. Burning is usually not allowed.
Concrete Sealers
Unused virgin concrete sealers typically have a flash point below 140° F which would classify the product as an ignitable hazardous waste. The product upon use, however, with the volatile components evaporated, would no longer meet the criteria of ignitable/flammable.

Contaminated Soil or Sediment
Contaminated soil is an industrial waste and requires disposal at municipal/commercial disposal facilities (such as sanitary landfills) reclamation facilities or at specialized facilities for the type of contamination present. The potential for the contaminated soil to be a hazardous waste due to characteristics such as flammability or toxic metal content must also be considered. If soil or sediment contamination is suspected, call the RLA/ESU to help arrange for further investigation and possible testing. Soil or sediment may be contaminated if it is discolored or stained, or smells like fuel or sewage.

Culvert and Catch Basin Cleaning
Uncontaminated grit and sediment from culverts and catch basins is normally disposed of as C&D waste and is not considered contaminated unless it smells like petroleum, fuel, or solvents, or is mixed in with other wastes like roadside trash.

Degreasers
See “Parts Washer Wastes”.

Drums and Containers
Drums and containers that have had all of the contents removed by common practices and have less than 1 inch and less than 3 percent of the original product are considered “empty” and nonhazardous, even if the material they contained (such as solvents or coatings with flashpoints below 140 degrees F) would otherwise be classified as a hazardous waste. “Empty” containers may be returned to the manufacturer or sent to a reconditioner or handled as scrap metal, cardboard, etc. and are exempt from waste transporter requirements when destined for such reuse. “Empty” containers are nonhazardous industrial wastes when otherwise disposed. Small containers of up to ten gallon capacity are, however, considered C&D debris and can be disposed of as such. The original product label and hazard warnings must be left on drums or containers until they are empty as described above and no longer pose the indicated hazard. Remove or obliterate the label and mark the drum “empty” as soon as the drum is empty by these criteria. The hazard markings must be removed from an empty drum meeting these criteria prior to removing from the facility.
Drums are considered empty when there is less than one inch of product remaining and less than three percent of the original product in the drums. Empty drums should be stored neatly in a designated area with lids and bungs secured with end drums blocked to prevent rolling. The empty drum storage area should be in a location that does not permit surface water to collect or wash through the storage area. Empty drums should be disposed of at least annually. Abandoned drums or containers of unknown substances that are found along the ROW are handled similarly to spills of hazardous substances on the ROW and may need to be reviewed by police. Further details are available in the following discussion on drum management within facilities.
**Fills**

Suitable fills are environmentally inert, uncontaminated, non-water soluble, solid materials. Only suitable fills should be used to level an area or bring it to grade provided the area is not located in a wetland. Suitable fills may be commingled with other suitable fills at maintenance stockpiles while being stored prior to placement in a fill area. Examples of suitable fills include:

1. Shoulder cuttings
2. Bituminous asphalt excavations pipe excavations (but not metal or plastic pipes)
3. Crushed Portland cement concrete without exposed reinforcement bars
4. Bricks and solid masonry blocks
5. Clearing and grubbing vegetation

**Fluorescent Bulbs**

Typical spent fluorescent bulbs (lamps) are hazardous wastes due to mercury content. Intact (not crushed or broken) fluorescent lamps are eligible to be handled as “universal wastes” allowing for somewhat reduced regulation (See “Universal Wastes”). Some manufacturers are marketing lamps with lower mercury content; these lamps may not be hazardous wastes when spent. Unless the lamps are marked (or otherwise identified) as low mercury content lamps, assume that the lamps must be handled and disposed of as a universal or hazardous waste. The waste bulbs can be disposed of using specialty waste contracts or by using the Office of General Services contracts for disposal of lighting wastes from state facilities. Lamps that are marked or identified as low mercury must be evaluated to determine if they are a hazardous waste; manufacturer’s data may be used to support a determination that particular lamps are not a hazardous waste. Note: The ballast should be segregated from the lamp and may also be a hazardous waste due to PCB content (See “Ballasts”).

**Fuel Filters**

Used gasoline or diesel fuel filters are classified as hazardous wastes because they typically have the characteristic of ignitability or toxicity for benzene. These should be stored in closed containers, separate from other wastes, and labeled, handled and disposed as hazardous wastes. However, if the fuel filters can be drained of all free liquids, they can qualify as scrap metal and be recycled at a scrap metal facility, under the scrap metal exemption.

**Grease and Tar**

Collect grease and soft tar in separate containers with proper labeling. Include these containers for disposal by a specialty waste disposal contract. Greasy rags should be collected along with oily rags and absorbents and properly disposed by arrangement with the Petroleum/Waste Management Superintendent. Greasy rags should not be disposed of in the regular trash. Any waste grease should be disposed of as special waste by arrangement with the Petroleum/Waste Management Superintendent.

**Hazardous Substances in Equipment**

Some equipment contains hazardous substances that may require special handling and
disposal. Examples include switches or thermometers that contain mercury, or ballasts and light fixtures with PCBs (See “Universal Wastes” and “Ballasts”). Call the environmental specialist or landscape architect with specific questions.

**Herbicides**
Herbicides are regulated pesticides. See “Pesticides”

**Hydraulic Fluid**
Hydraulic fluid products such as brake fluid, transmission fluid and power steering fluid are chemically different from motor oil, but NYSDEC Used Oil regulations considers them used oil and allows mixture and recycling along with used oil. The recycler/disposal firm should be consulted, however, on their specific requirements. The fluids also must not be contaminated with any solvents or other materials that could cause them to be hazardous wastes.

**Lighting Waste**
See “Ballasts” and/or “Fluorescent Bulbs”.

**Litter**
See “Adopt-a-Highway Waste”

**Medical Waste (Used Syringes or Needles)**
Used hypodermic needles and syringes are sometimes discarded at rest areas or along ROW. They are classified as household waste, not as “regulated medical waste” as defined in the Public Health Law when they are found at public recreation spots such as rest areas. Used needles and other “sharps” can poke workers, and some bloodborne diseases like hepatitis can be transmitted if the virus is present. (The AIDS virus is unlikely to live more than an hour outside a human host, but should also be considered a risk.) CAREFULLY place the syringe in a container and label with a biohazard sign (or use red containers). Disposal should be at a local hospital or other facility that can accept medical waste.

**Oil**
Environmental stewardship practices for used oil include the following:

1. **Collection:** Used oil produced at M&O facilities should be collected for recycling or burning in approved used oil furnaces. The DOT should collect used oil in drums or tanks clearly marked “USED OIL” for transportation to locations with used oil burners. Care should be taken not to contaminate the used oil with hazardous materials, or other non-approved materials.

2. **Storage:** Oil storage tanks or drums should be located in areas with an impervious floor (such as concrete). Tanks should have secondary containment where risk of damage (e.g., by vehicles) is high, or where the impacts of a spill would be severe (e.g., proximate to floor drains). Metal tanks or drums should not be in direct contact with the ground (contact with a dry floor is permitted); only tanks with double-walls and a leak detection system maybe placed on or below the ground surface.

3. **Used oil tanks or drums should be clearly labeled as such, and should be posted**
with a list of what is permitted to be dumped into the tank. All used oil tanks that could be accessible by the public (outside) should be locked to prevent unauthorized dumping of hazardous or non-approved materials into the tanks.

4 Storage tanks should be inspected by the Petroleum/Waste Management Superintendent and/or Division personnel at least annually for structural integrity. The supervisor should keep a record of the inspection at the facility. The DOT should arrange for recoating or replacement of tanks that are rusting and/or pitted. Existing spill containment structures should be inspected annually for structural integrity and repaired if necessary (such as filling in cracks in concrete).

5 Suspected contamination of oil waste: If the used oil is suspected of containing contaminants, such as solvents, brake cleaner, or toxic metals, then the contaminated oil should be contained separately and disposed of as hazardous waste (see Bureau of M&O Hazardous Waste Management Procedure).

Used oil filters are considered a non-hazardous waste if the used oil is removed from the filter. The filter may then be preferentially recycled as scrap metal or otherwise disposed of as non-hazardous waste. Environmental stewardship practices for used oil include the following:

1 Oil filter recycling should be available at all M&O facilities.

2 Collection procedures should be established for each location.

3 The drained oil should be combined with other used oil from the site for recycling. See “Used Oil”.

4 Properly drained or crushed filters should be placed in a container marked “used oil filters” and disposed of every ninety days.

In order for the oil to be considered removed, filters should be gravity hot-drained by one of the following methods:

- Puncturing the filter and hot draining. EPA recommends that hot draining occur at or near engine operating temperature for at least 12 hours.
- Hot draining and then crushing the filter.
- Dismantling and hot-draining.
- Any other equivalent hot draining method that will remove used oil.

Environmental stewardship practices for use of oil absorbents include the following:

- Types and use of absorbents: Maintenance workers should be provided with, and trained in the use of, spill pans and absorbents to minimize spills or drips on shop floors, and to reduce the quantity of absorbents used. Absorbent pads and pans should be provided as appropriate for the following:
  - Under spigots on oil dispensing drums and tanks;
  - Under leaky hydraulic valve boxes and hoses (hoses should also be capped and elevated where possible);
  - Around used oil collection tanks and associated filter pipes and drainage racks; and,
Under vehicles and machinery undergoing repair or maintenance.

- **Collection of used absorbents**: Oily absorbents (including Speedi-Dry) should be collected in a sealable container (such as a drum) and properly disposed by arrangement with the Petroleum/Waste Management Superintendent. Oily waste should not be disposed of with regular trash.

- **Substitute absorbents**: When possible, M&O should use substitute absorbent materials which are not clay-based. DOTs should maintain an approved list of absorbent materials.

**Paint**

Most unused paints, including waterborne, have a flashpoint below 140 F and therefore require handling and disposal as an ignitable waste. If the paint contains lead or chromium, the potential for the waste to have a toxicity characteristic for lead or chromium must also be considered. Yellow waterborne traffic marking paint may contain significant amounts of lead chromate. Limited testing of the waterborne yellow paint, however, has indicated that it did not fail the toxicity characteristic tests. Consult the Material Safety Data Sheet (MSDS) and the RLA/ESU for further information.

**Dried Paint Chips and Flakes**

Dried pavement marking paints and other non-lead dried paint are non-hazardous industrial wastes, requiring disposal at a municipal landfill. These dried paints would include markings purposely removed/milled from the road surface, but would not include the paint markings incidentally present on an entire removed section of roadway which would qualify as C&D debris. Some dried paints containing lead such as former lead-based bridge paint removal debris are considered a hazardous waste for their lead content and must be disposed of as hazardous waste. Testing of typical dried yellow pavement marking paints (waterborne and epoxy), however, has indicated that, although lead and chromium are present in significant concentrations, they are under regulatory levels for hazardous waste. Note: Landfills, however, may be unwilling to accept paint waste and/or may require additional testing. Dried paint wastes may also be collected, stored and disposed of by the specialty waste disposal contract. An overview of Missouri DOT’s lead paint recycling program is included in section 7.3.

**Paint Thinner**

Most paint thinners are organic solvents that would be listed or ignitable wastes. Store and handle these as hazardous wastes.

**Parts Washer Wastes**

Spent solvents from parts washers may be hazardous wastes due to ignitability. The solvent used in Safety Clean parts washers typically has a flashpoint below 140 degrees F and would be an ignitable waste upon disposal. Any contaminants such as metals that could be added through use must also be considered. Typical spent filters (bag and cartridge filters) from Zep parts washers have been tested for contaminants including metals that could be introduced during its operation and were under regulatory limits and are therefore determined to be a non-hazardous waste.

**Parts Cleaner Waste**
• **Parts cleaner solvent:** All M&O facilities should use parts cleaner solvent, approved by the Petroleum/Waste Maintenance Superintendent, that would not be classified as a hazardous waste if contamination by metals or other chemicals did not occur during use. For example, do not use solvents that contain chlorinated compounds (e.g., trichloroethylene) or have a flash F° point less than 140. Maintenance personnel should not contaminate the parts cleaner with hazardous materials, such as chlorinated solvents often contained in spray cleaners (e.g., some brake cleaners).

• **Disposal of used parts cleaner solvent:** Spent parts cleaner and parts cleaner filters will be disposed of as hazardous waste (note: used solvent may be hazardous even if the virgin product is not hazardous, due to contamination during use.) See M&O Hazardous Waste Management Procedure.

• **Registration of parts cleaners:** The DOT Safety Coordinator should register any parts cleaners containing volatile solvents with the state environmental agency. At a minimum, the DOT should keep an inventory of parts cleaners in service, and will notify the environmental agency of the size or volume and type of parts cleaner, and the type of solvent used. The DOT should determine if additional requirements apply depending on the volatile organic content of the solvent.

**Pesticides (Includes Herbicides and Insecticides)**
Keep all pesticides in their original, labeled containers, and keep its Material Safety Data Sheet (MSDS) on file at the facility. Partly used containers should be saved for next use. Pesticides that can not be used must be disposed of by a specialty waste contract. Empty containers of non-combustible pesticides may be disposed of as non-hazardous waste after triple rinsing (with the rinse water used to make up the next batch of herbicide); or, for ready-to-use (do not require dilution) pesticides, after draining for one thirty second period. (See also “Empty Drums and Containers”).

**Petroleum Contaminated Soil**
Soil materials contaminated with petroleum products, including (but is not limited to) gasoline, heating oils, diesel fuel, kerosene, jet fuel, lubricating oils, motor oils, greases, and other fractions of crude oil are considered petroleum contaminated soil and require disposal as industrial waste (See “Contaminated Soil and Sediment”).

**Refrigerants**
Refrigerants such as Freon are used in air conditioning systems and contain chlorofluorocarbons (CFCs) which pollute the air. Freon and other refrigerants must be removed and recycled by workers with EPA-approved training. Maintain records that show the name of the recycling facility that removed the refrigerants.

**Shop Rags (or Shop Towels)**
When rags are used to clean up known nonhazardous waste materials such as non-hazardous cleaning solvents or hydraulic fluid or motor oil, the rags would not be a hazardous waste. If, however, rags were used to soak up a material that would be a hazardous waste (toluene or chlorinated solvents for example), the rag could be a hazardous waste. Hazardous waste rags are not regulated as hazardous wastes if they are sent out to be cleaned and returned for re-use. All used rags, shop towels, and clothing
soiled with parts cleaner, gasoline or diesel fuel, used oil, etc. should be stored and managed in fire-proof or fire-resistant containers and must not be so saturated that they can drip any free liquid. Since DOTs should avoid using chlorinated solvents or hazardous waste cleaning solvent or other listed materials, rags for disposal should not be non-hazardous industrial wastes. Any rags, however, that were used for potentially hazardous waste materials could be hazardous wastes requiring disposal as specialty hazardous wastes and should be kept separate from non-hazardous waste rags. Contact the DOT environmental specialist for assistance in determining if non-routine rags for disposal are hazardous wastes.

**Solvents and Degreasers**
See “Parts Washer Wastes” or “Paint Thinner”.

**Sorbents (Speedi-Dry or Sorbent Pads)**
When sorbents are used to clean up spills from known nonhazardous sources such as hydraulic fluid or non-flammable (non-chlorinated) parts washers, the used sorbent is not a hazardous waste and may be disposed of as routine nonhazardous waste. Sorbents used to clean up known hazardous wastes, however, would also be a hazardous waste. When sorbents are used to clean up spills from unknown sources, they could be hazardous wastes and should be tested. Call the RLA/ESU to arrange for testing and/or disposal as specialty wastes.

Street Sweepings (Shoulder Maintenance) — Routine street sweepings are not considered contaminated and can be handled like fill or sent to a C&D (construction and demolition) or municipal waste landfill. Street sweepings should be handled as contaminated soil if they smell like petroleum or solvents, or contain considerable roadside litter such as paper, cigarette butts, plastic, etc. Contaminated street sweepings must be sent to a municipal landfill. This topic is covered in greater detail in roadside, non-vegetative management practices.

**Tires**
Waste tires and scrap tires collected along state highways can be stored for up to 18 months. A permit is often required to store more than 1,000 tires. Waste tires can be sent to a landfill, recycler, or trash-burning incinerator, but some landfills do not accept scrap tires because they are bulky and tend to “float” to the top of the waste pile. Some cement kilns or burn plants can burn tires for fuel. Check with the local waste hauler or landfill to see how to dispose of waste tires in the area. Used tires should be stacked by size, type of construction and vehicle use and stored under roof or tarped. Used tires should be disposed of annually or whenever they number 500 in count, whichever comes first. Routine trash and Adopt-A-Highway Waste is considered non-hazardous waste and can be disposed of as routine refuse at municipal/commercial landfills or disposal facilities. Some wastes need special handling. Such wastes include Abandoned Drums and Containers, Medical Waste, Tires, etc. See pavement and materials recycling section.

**Universal Wastes**
Certain common hazardous wastes that were considered to be low risk have been designated as “universal wastes” with somewhat reduced regulation. Universal wastes currently include spent batteries, certain unused pesticides, fluorescent bulbs
containing mercury and mercury thermostats. Manifests are not required for shipment (although permitted waste transporters are required for transport of >500 pounds/shipment) and wastes may be accumulated on site for up to 1 year. Small quantity handlers (up to 5,000 kg at one time) do not need an EPA ID number.

Used Oil (Waste Oil) — Used oil that is destined for recycling or burning for energy recovery is not regulated as a hazardous waste. Examples of used oils include spent motor oil, hydraulic oil, cutting oil, transmission fluid, fuel oils, gear oil and greases (Note: waste fuel oil is not regulated as used oil). Used oil should be collected into clearly labeled tanks or drums. Do not mix any other materials such as solvents, antifreeze or gasoline with the used oil. (If some type of hazardous waste such as solvents, degreasers, etc. are mixed with the used oil, then the entire volume may be classified as a hazardous waste.) The used oil should be sent to an authorized recycler or fuel blender using a permitted Waste Transporter.

Drum/Container Management

Drum or container management applies to any used metal, plastic, fiberglass or laminate drums/containers, typically 5 gallons in capacity or larger, used for bulk storage of liquids, solids or waste materials. The Maine Department of Transportation developed the following procedure and environmental stewardship practices for managing drums and containers:

1. Establish a procedure for managing drums and smaller containers (such as 5-gallon pails) on Maintenance and Operations facilities. Procedures should be audited (checked for compliance and improved) annually.

2. Ensure personnel are trained to properly manage used drums/containers to prevent releases of drum/container residues (e.g., oil or chemicals) to the environment and to maintain a safe, neat working environment. All employees who use or manage drums/containers should be trained at least annually and easy-to-follow guidelines for proper management of used drums/containers should be prepared. Training records should be kept in a central location.

3. Routine inspections of facilities by the Division Manager/Engineer, Division Safety Coordinator, or the Environmental office should include a review of drum/container management practices.

4. Crew supervisors should have primary day-to-day responsibility for compliance with drum management policies and procedures.

Drum/Container labeling

1. All drums/containers should either be labeled “empty” or with the intended contents, such as “trash” or “oily rags.”
   - Empty drum/containers need not be labeled if they are neatly stockpiled in a designated area marked with a sign “Empty drums”.
   - Labels may be adhesive type (waterproof if exposed to the weather), or painted. Painted labels should be legible. Old labels should be removed or completely covered.
   - Drums containing inert metal parts do not need to be labeled.
Drum/Container purchasing
1 The DOT should not purchase or obtain drums/containers from any source other than a vendor supplying new or properly reconditioned drums; i.e., an approved vendor.

Recycling, Reuse, and Disposal of Used Drums/Containers
1 Only sound drums/containers in good condition, free of substantial rust, cracks or dents, should be used by maintenance and operations
2 Drums/containers should be thoroughly drained so that no “flowable” product remains. Product should be used for its intended purpose, or, if obsolete, disposed properly based on the waste type.
3 Only drums/containers that formerly contained the following should be reused:
   o Motor oil
   o Hydraulic oil
   o Gear oil
   o Transmission fluid
   o Grease
   o Antifreeze
   o Soap/detergents
Drums containing other materials should only be reused if approved by the Division Manager/Engineer in consultation with the Environmental Office (ENV) and Office of Human Resources, Safety Section, if appropriate. See Section 6.7 below for special requirements for containers from pesticides or herbicides.
1 Prior to reuse, drums/containers should be cleaned by wiping or another approved method that does not result in the release of drum/container residuals to the environment (soils, groundwater or surface water).
   o Cloths or other materials used for wiping should be cleaned and reused or disposed of properly. For example, oily rags should be disposed in the facility oily waste container.
   o Alternatively, arrangements can be made with an outside vendor for reconditioning of used drums.
1 Empty drums/containers, containing no residual product but not suitable for DOT reuse should be recycled for scrap metal as part of a metals recycling program.
2 Drums/containers that contain residues of oil, chemicals or other waste should be disposed properly in accordance with the waste type.

Spills and Leaks
Numerous federal and state regulations specify extensive requirements for the prevention
of spills and leaks of hazardous wastes at DOT facilities. In addition, many federal, state, and local agencies should be immediately notified of a hazardous waste release. Severe penalties and fines are often imposed for failure to notify. The first and most important step in a spill or leak response is to safely contain the spill and stabilize the situation by following the methods described in the facility’s PPC Plan, and then to notify the proper authorities.

Spill prevention and control procedures and practices are typically implemented to prevent and control spills in a manner that minimizes or prevents the discharge of spilled material to drainage systems or watercourses. Spill prevention and control procedures are typically implemented wherever chemicals and/or hazardous substances are stored. Substances may include, but are not limited to, soil stabilizers, dust palliatives, herbicides, growth inhibitors, fertilizers, de-icing chemicals, fuels, lubricants and other petroleum distillates. To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under Title 40 of the Code of Federal Regulations (CFR) Parts 110, 117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

Caltrans and NYSDOT employ the following spill prevention practices:(()

1. To the extent that this action does not compromise cleanup activities, spills should be covered and protected from stormwater run-on during rainfall.

2. Spills shall not be buried or washed with water.

3. Used cleanup materials, contaminated materials and recovered spill material that is no longer suitable for its intended purpose should be stored and disposed of in conformance with these special provisions.

4. Water used for cleaning and decontamination shall not be allowed to enter storm drains or watercourses.

5. Water overflow or minor water spillage should be contained and shall not be allowed to discharge into drainage facilities or water courses.

6. Proper storage, cleanup and spill reporting instructions for hazardous materials stored or used on a project site should be posted at all times in an open, conspicuous and accessible location.

7. Waste storage areas should be kept clean, well organized and equipped with ample cleanup supplies that are appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

8. Spill control cleanup materials should be located near material storage, unloading, and use areas.

9. Update spill prevention and control plans and stock appropriate cleanup materials whenever changes occur in the types of chemicals stored on-site.

10. Inform and remove unnecessary employees from the area.

11. Determine the identity and hazards of the material and any personal protective equipment such as impermeable gloves required for handling.
12 If the spilled material is flammable, remove any open flames or sources of ignition. Use non-sparking tools and grounding wires if needed.

13 Stop additional material from spilling at its source if possible. For example, plug a leaking hole in a barrel or turn the barrel so that hole is on top.

14 Plug any drains that may be impacted.

15 Contain the spill by placing absorbent “socks” or sand to prevent the spill from running into storm drains, bare soil, large surface areas, etc.

16 Pump large quantities to an empty drum that will hold the material.

17 Collect smaller quantities and/or remaining liquid by absorbing liquid with absorbents or sand. Gently scoop or sweep up the residue and place in empty container.

18 Label all containers of spill collection and debris as soon as possible.

19 Do not try to clean up spills of unfamiliar materials if adequate hazard communication information is not in place.

**Emergency Preparedness and Response Planning**

Emergency preparedness and response plans are typically required by law, regulation, or DOT policy for each facility/depot.

1 Each emergency preparedness and response plan should show the issue and revision date, a list of holders of the copies and their locations, and a log of revisions issued.

2 Division Manager/Engineers should establish a schedule to test the effectiveness of the emergency preparedness and response plans, using drills or mock emergencies. At least one test or drill should be conducted annually. (A real emergency may be considered as a test.)

3 Division Managers/Engineers should hold a debrief session after each real emergency, test or drill, and prepare a written summary of lessons learned and any necessary revisions to facility operations, or to the plan.

4 Emergency plans should be reviewed by the Division Manager/Engineer in consultation with environmental staff at least once per year, or when significant changes are made in operations or facilities, to determine if the plans require revision. Revisions should be distributed to holders of all copies, and revision dates will be noted in the revision logs.

**Communication and Training for Emergency Preparedness and Response**

1 DOTs should provide for emergency preparedness and response training for new employees, and annual refresher training for current employees, based on the current emergency preparedness and response plans. Major revisions of a facility plan will require training updates in a timely fashion.

2 Current copies of each emergency preparedness and response plan should be provided to crew supervisors, to appropriate local emergency response agencies (fire, rescue, police, local emergency management agency, etc.) and to
appropriate state and federal agencies as required.

3 A copy of the plan(s) should be kept at strategic locations in the facility so it can be easily accessed in an emergency.

4 A current copy of each emergency preparedness and response plan should be provided to major contractors who will be operating on site for an extended period of time, as well as emergency preparedness and response training, as appropriate. Contractors working on site may be required to provide a copy of their own emergency preparedness and response plan for their own work (e.g. a spill prevention plan for equipment operated on site).

**Spill Prevention Control and Countermeasures (SPCC) Plans**

Missouri DOT identified the following information from a U.S. EPA teleconference to help aid facilities in understanding and working with Spill Prevention Control and Countermeasures Plans and new requirements.

**What is to be Covered in the Plan?**

1 Oil of any kind and hazardous materials (list found at [www.uscg.mil/vrp/faq/oil.shtml](http://www.uscg.mil/vrp/faq/oil.shtml))

2 Total volume of materials listed, total over 1,320 gallons counting containers 55 gallons or over

3 Material can reach Waters of the U.S., which include lakes, rivers, streams, dry creek beds, ditches, wetlands, and tributaries to these.

4 Manmade structures, dikes, equipment are not considered reasons that our oil cannot leave our property and cannot be used as a reason to not have a plan in place

**Requirements for Preparation and Implementation**

1 Professional Engineer (PE) must certify
   
   o They are familiar with the rule
   o The PE or agent has visited and examined the facility
   o The plan is prepared in accordance with good engineering practice (considering applicable industry standards) and with rule
   o Testing and inspection procedures are established
   o The plan is adequate for the facility

1 The plan
   
   o It must be kept at the nearest manned facility
   o Provided to the inspector during normal working hours

1 Written report must be submitted
- Spill >1,000 gallons to the environment
- Two reportable spills of >42 gallons in a year
- Submitted to EPA and MDNR
- EPA and MDNR may require amendments to the plan at that time

1. Plan amendments by owner/operator are required
   - When there is a physical change affecting potential for a spill (such as taking down or adding tanks)
   - Review plan every five (5) years
   - Document review and amend to include more effective spill control technology
   - Only technical amendments must be certified by a PE
   - Changes in phone numbers, supervisor, employees and other non-technical changes do not need a PE re-certification

1. Signed by owner/operator (supervisor or superintendent)

2. Follow the sequence rule 112.7 for the plan

3. List equivalent environmental protection

4. Provide detailed diagram of facility

5. Describe prevention and countermeasures
   - Type of product and capacity of each container
   - Prevention measures for handling and storage
   - Discharge and drainage controls
   - Countermeasures, disposal and reporting of discharge

1. Spill prediction section on what would cause a spill and where would it flow

2. List and describe containment
   - Dikes or berms that are sufficient impervious to contain spilled material until it is cleaned up
   - Curbing, culverting, gutters or other drainage
   - Weirs, booms or other barriers
   - Spill diversion or retention ponds
   - Show direction drainage for all containers

1. If a facility cannot physically put in containment
   - Explain why
Conduct integrity testing of tanks and leak testing of pipes and valves more often

Develop a contingency plan (response plan) (40CFR109)

Have a written commitment of manpower and equipment to stop a spill and clean it up (good idea for all our plans anyway)

1 Records must be kept for three years with plan and signed by supervisor, and include the following:

- Frequency of testing and inspection of tanks
- For tank, piping, valve inspection and testing
- Water drained from containment
- SPCC plan review every five (5) years

1 Training and personnel requirements

- Annual or as determined by DOT
- MoDOT conduct training for employees on equipment and spill prevention and response procedures
- One person must be designated as responsible for SPCC requirements
- Conduct and document periodic briefing on recent problems and new spill prevention measures (frequency determined by need)

1 Security

- Facility or area with tanks must be fenced unless occupied 24 hours a day to deter vandals, commensurate to location, and gated and locked when not occupied
- Master flow and drain valves on tanks and containment must be secured in the closed position unless in use (locked)
- Pump starter controls must be locked and only accessible to authorized personnel
- Loading and unloading connections must be capped when not in service and locked if they can result in a release
- Adequate lighting to detect and cleanup spills at night and deter vandals

1 Loading and unloading areas

- Must have secondary containment for largest tank plus 10 percent such as:
- Quick drainage system
- Catch basin or treatment system
- Curbing or speed bump type berms
- Diversion to secondary containment
- Trenches, sumps, USTs etc.
- Seal drains
- Cleaned up after spill

1 The following can be made the responsibility of the supplier
- Monitoring continuously during filling or loading operations
- System to prevent trucks from leaving prematurely
  - Physical barrier
  - Warning light
  - Wheel chocks
  - Or vehicle brake interlock system
- Inspect vehicles for leaks before departing

1 Field constructed tanks. Evaluate brittle fracture and take appropriate action if the container undergoes the following
- Repair
- Alteration
- Reconstruction
- Change in service

1 Conformance to oil pollution prevention rules
- Discuss conformance with the rules in the SPCC plan
- Discuss conformance with any applicable more stringent state rules, regulations and guidelines
- Explain where and why there is non-compliance with any of the rules

**Facility Drainage**

1 Secondary containment must
- Hold the contents of the largest tank
- Plus sufficient freeboard for 25 year even rainfall (10 percent)
- Be sufficiently impervious to hold a spill until it can be detected and cleaned up
- Free of vegetation that would compromise the containment or inhibit inspections
- Water drained from diked areas to allow room for the largest tank’s
contents (always remove oil from water first)

1 Restrain drainage
   o By manual controlled pumps
   o Manual siphons
   o Discharge to approved treatment system
   o Manual valves
   o May not use flapper-type drain valves
   o Catch basins
      - Underflow designed piping
      - Through wall valved pipe
      - Retain oil until discovered
      - Located outside flood prone areas
   o Engineered flow control with curbing, trenches, dikes, terrace, or diversion pond
   o Minimum of two lift pumps at lift stations for treatment systems

1 Empty containment
   o Uncontaminated storm water
   o Only after visual inspection
   o Removal of oil from water
   o Only when safe to discharge to approved treatment system
   o Remove all trash and properly dispose of material
   o Clean any oil from containment
   o Record each event with Date, Time, Volume released (may need to estimate), and Where discharged

Bulk Storage Containers
1 Must be compatible with material stored inside
2 Contain necessary pressure and temperature
3 Design so containment can be provided
4 Keep any bypass valves sealed and closed (locked)
5 Record inspection and tank testing
   o Visual inspection monthly of tank and secondary containment, looking for:
- Corrosion and deterioration
- Product discharges inside containment
- Dents or holes
- Scrapped paint
- Cracked valves or fittings
- Any other visual damage the may jeopardize the integrity of the tank or containment
- Cracks
- Facility effluents
  o Testing by certified tester or equivalent
    - Performed according to manufactures standards and recommendations
    - Conducted at intervals recommended by industry or engineer (above ground tanks are usually tested every 10 to 15 years)
    - Must be done when changes are made that may affect the integrity of the tank or it was damaged.
  o Intervals must be in plan along with records of inspections and testing

1. Inspect water before discharge under responsible supervision
2. Test each aboveground container for integrity on a regular schedule, and whenever you make material repairs and keep a record. Methods include but are not limited to
   o Hydrostatic testing
   o Radiographic testing
   o Ultrasonic testing
   o Acoustic emissions testing
   o Other non-destructive shell testing

Transfer Operations, Piping and Pumping
1. Buried metal piping must be coated, wrapped and cathodically protected
2. Exposed buried line must be inspected for deterioration and repaired as needed
3. Out of service piping must be drained, labeled and capped
4. Pipe supports must be designed to minimize corrosion
5. Above ground piping and valves must be inspected regularly and recorded
6. Buried pipes must be leak tested when installed, modified, construction,
relocation, or replacement

7 Pipes must be protected from vehicular traffic with warning signs and barriers

Records to Maintain

1 Emergency contacts

2 Substantial Harm Criteria Checklist

3 Maps showing tanks, piping, loading areas, and where spill would flow if they got outside secondary containment

4 Secondary containment calculations

5 Spill notification form

6 Other records
   o Employee sign familiarity sign sheet
   o Employee training roster
   o Inspection records for tanks, valves, and piping (monthly visual inspections)

Finding and Resolving Illicit Connections, Illicit Discharge, and Illegal Dumping

Illegal dumping and spills can encroach on DOT properties. Accessible DOT properties, such as safety roadside rest areas, vista points, turnouts, and weigh stations, provide tempting places for illegal dumping. Illegally dumped and spilled materials have potential to flow into receiving waters. This section reviews environmental stewardship practices for minimizing the impact of illegal dumping and spills that are outlined in the Caltrans Stormwater Quality Handbooks, Maintenance Staff Guide.

1 Look for potential dumping at drain inlets, open channels, and municipal storm drain system tie-ins. Warning signs can include:

2 Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils.

3 Pungent odors coming from the drainage system.

4 Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes.

5 Dumping of debris or medical waste at a particular location, where the proximity to the drain system could impact water quality.

6 When any field maintenance employee witnesses or discovers a suspected illegal dumping to a DOT storm drain system, it should be report it to the supervisor.
   o If the substance is known to be hazardous, suspected of being hazardous, or cannot be identified, notify the District Maintenance HazMat Manager immediately.
   o If an illegally dumped substance within DOT right-of-way has the
potential of entering a municipal drain system, notify the supervisor and the District Maintenance Stormwater Coordinator so that the downstream municipality can be contacted.

- Provide protection for adjacent drain inlets to prevent entry of the illegally dumped substance, if it is safe to do so.

1. Perform cleanup and corrective actions for illegal dumping and spills on DOT right-of-way in accordance with DOT procedures and District HazMat Spill Contingency Plan.

2. Maintenance supervisor should follow up on the incident to ensure the appropriate agencies have been contacted and corrective actions have taken place.

**DOT Contribution to Local Spill Prevention Initiatives**

In some cases, DOT maintenance staff have taken the initiative to contribute to local environmental protection and conservation initiatives. The Skaeneateles Lake Watershed provides drinking water to a quarter million people and is completely encircled by highways. NYSDOT's Region 3 Maintenance Group formed a partnership with the City of Syracuse Board of Water Supply, NYS Department of Environmental Conservation (NYSDEC) and local officials and took the lead in addressing spill-related water quality concerns. NYSDOT identified 15 sites and potential contaminant pathways that most directly threaten water quality, and mitigated those sites through the installation of stone check dams/retention basins to treat daily runoff and to temporarily retain any spills that may occur at these sites. Also, all Department maintenance staff working in the 20-square-mile watershed have been provided sensitivity training and spill clean-up materials. In addition, local DPWs in the watershed have been provided with similar spill control materials and the local fire department has been provided with culvert plugs, absorbent materials and a commercial grade spill containment boom.

**Ventilation and Exhaust Systems at Maintenance Facilities**

Some operations and process ventilation that can release contaminants to the air may require an air permit from a state regulatory agency. For example, paint spray booths are likely to require an air quality permit if:

1. More than 25 gallons of paint and solvents (combined) are used in a month,
2. The paint spray booth is located where air quality is poor for ozone, or
3. Exhaust gases from sanding and painting do not pass through filters or other emission control devices.

**Facility Inspection and Reinspection to Achieve Environmental Goals and Continuous Improvement**

Facility inspection and reinspection programs are discussed in detail under Chapter 2, Organizational Environmental Stewardship Practices. Maine DOT and Mass Highway boast excellent examples of facilities auditing procedures and practices. Caltrans’ reinspection program has found that follow up on initial inspection results has improved housekeeping, spill cleanup, hazardous materials and waste storage and
documentation practices. Specific criteria were defined for selecting facilities for reinspection: 

1 Number of compliance action items identified from the initial inspection
2 Progress made on action items based on documentation submitted by the facility
3 Size of the yard and number of crews
4 Proximity to the nearest downstream watercourse
5 Types of materials stored at the facility

Caltrans identified the following reasons for follow up inspections of maintenance facilities:

1 Enhance compliance at facilities considered to be facing the greatest stormwater management challenges.
2 Provide facility-specific training to improve staff understanding of stormwater requirements and Environmental stewardship practices.
3 Prepare facilities for regulatory agency inspections.
4 Review and offer assistance in filing procedures for stormwater documentation.

DOTs that employ such audits and inspections, often do so on a rotating five year basis, so 20 percent of facilities are audited or reinspected in any given year.

6.3 Yard and Floor Drain Management

Many DOT facilities have floor drains in buildings and surface drains in the “yard” that discharge washwater and stormwater through underground pipes or open ditches, a ditch, or a right-of-way culvert, or off-site to a neighboring property and, potentially, to the waters of the state. Shop floor drain effluent can include motor vehicle fluids spilled as a result of vehicle maintenance and repair, and washbay washwater, especially from salt truck and salt bed washing during snow and ice season. Flows off of maintenance yards may ultimately reach waters of the state, either indirectly or via direct discharge into a side ditch.

Discharges from floor drains to surface and groundwaters are generally regulated through the National Pollutant Discharge Elimination System (NPDES) and state administered NPDES programs, often called SPDES. NPDES/SPDES permits are issued and required for discharges to waters of the state. Some facilities have installed oil/water separators as interceptors; however, such separators are not effective in removing soluble contaminants such as salt from the discharge.

Procedural Practices and Other Non-Structural BMPs

Stormwater/Washwater BMPs for Surface Runoff

Much of the impact from surface stormwater/meltwater runoff can be significantly reduced by removing contaminants from the path of the sheet flow and point discharges.

1 The salt/sand mixing/loading area should be swept clean after each load.
2 The salt/sand mixing/loading area should be bermed to contain the material until
it can be cleaned or the mixing/loading is performed inside the salt storage facility or under a roof. Where paved berms have not been installed, Indiana DOT recommends that a windrow of abrasives [sand] should be placed around all outside stockpiles [salt, salt/sand mix piles]. While minimally effective as a deterrent to stormwater/meltwater runoff, especially from a sloped surface, on level surfaces such windrows can allow pooling that would otherwise sheet flow around stockpiles causing migration of salt-contaminated stormwater off-site.

3 Containers of petroleum and liquid wastes stored outdoors are on a roofed pad enclosed by secondary containment.
   - Herbicide and paint mixing and loading should be done in designated, berm areas, preferably on a pad.
   - Any spill or residue should be immediately cleaned up.

1 Right-of-way trash and construction debris should be taken to a permitted landfill and not allowed to accumulate on site.

2 Salt bed washing should be performed in a washbay, not outdoors, and salt bed oiling, paint chipping and painting—if performed at the salt bed rack—should be done with the ground protected by a tarpaulin.

**Structural BMPs**

Structural BMPs are installed at most DOT facilities to reduce the offsite impacts of contaminated stormwater/washwater migration, though most of these have been added since construction.

1 Standard specifications for new salt storage buildings should include sufficient area for:
   - sand storage and salt/sand mixing/loading indoors
   - brine making
   - storage and bulk tank loading outdoors on a pad protected with secondary containment.

1 The exterior pad (to the salt storage building) should be sloped away from the building to its outer limits and the water retained by means of a curb or slope reversal of the pad itself in order that the runoff may be directed into a collection system.
   - The design of the exterior pad (where the mixing/loading operations are performed) should be mandated, not recommended, because the lack of exterior pad curbing has created over half of the salt contaminated stormwater problems observed in at least one DOT survey.
   - The curbing should only be used to allow pooling or to direct stormwater to a collection system. It should not be employed to direct stormwater offsite, as a point source discharge.

1 Roofs should be extended on old salt domes to provide a protected area for
mixing/loading and for replacement of smaller salt storage facilities.

2 Design and specification of structural BMPs should include central office staff and adherence to specification, with input from field personnel to avoid stormwater/washwater collection/discharge problems resulting from poor design.

427) The following practices are recommended for stewardship of water quality, runoff from maintenance yards and potential discharges from floor drains.

**Floor Drain Management**

Caltrans, Maine DOT, and NYSDOT utilize some of the following environmental stewardship practices for floor drain management.

1 Direct discharges from floor drains to groundwater through leach fields, septic systems, or dry wells should not be allowed.

2 Consider whether a floor drain discharge is truly necessary. If not, plug the floor drains with a plumber’s plug or concrete. If the drain is permanently closed and no discharge can occur, a grit collector, oil/water separator and NPDES/SPDES permit would not be required. A permit would be required for a grit collector and oil/water separator that discharge floor drain waters to surface water. Such permits may involve requirements to change vehicle parking patterns and perform vehicle maintenance only in areas away from the floor drains.

3 At facilities that do not discharge shop floor drain effluent to a Publicly Owned Treatment Works (POTW), oil/water separators should be used for washwater. Oil/water separators are effective at removing nonsoluble oil and other petroleum products, but do not remove substance in solution, such as antifreeze and chlorides from road salt. At some facilities, the oil/water separator is connected to a tank, catch basin or holding pond where the washbay effluent collects before being conveyed offsite. A hazardous waste or liquids recycling contractor pumps the contents of the separator or the holding tank, when needed.

4 Shop floor drains should be segregated from washbay drains and the flow should terminate at the oil/water separator or, beyond, at a holding tank. Shop floor drains are intended to capture any spills of automotive fluids occurring during vehicle maintenance. No other liquids, including washwater, should be allowed to enter the drain.

5 Centralize vehicle repair and maintenance at a subdistrict or district shop where possible, to avoid contamination of facility stormwater discharge.

6 Where possible install a grit collector and oil/water separator and connect to a municipal sewer system which eliminates the need for a NPDES/SPDES permit.

7 All floor drains should be are constructed with an oil/water separator as part of the system. All floor drain effluent must be forced to pass through an oil/water separator prior to being discharged from the system (i.e. before flowing to a tank, sewer district pipe, or infiltrated onto the surrounding grounds).

8 Division Managers/Engineers are responsible for knowing where floor drains discharge, and for compliance with the Department Floor Drain Policy.
Engineers/Managers should keep a current database of the method for managing wastewater from garage floors. This database should include, at a minimum, the presence and type of construction for floor drains and the method of managing effluent. Any changes to the construction or management of this effluent must be reported to the Highway Maintenance Engineer.

9 Hazardous waste containers should be provided with secondary containment where risk of damage is high (such as from vehicles) or where impacts from a spill would be severe (such as spills to floor drains that discharge to the ground). Secondary containment must be capable of holding 110 percent of the waste container volume.

10 Weekly inspections of hazardous waste storage areas should be performed.


12 Good spill prevention practices should be used. These include, at a minimum:
   - Keeping waste containers closed when not in use;
   - Protecting containers from damage from vehicles or other equipment;
   - Use of containers that are in good condition (not severely dented or rusty);
   - Use of funnels when pouring liquids into waste containers; and
   - Conducting periodic inspections of waste storage areas.

Management of Oil/Water Separators
Oil/water separators are tanks that collect oily vehicle wash water that flows along corrugated plates to encourage separation of solids and oil droplets. The oily solids or sludge can then be pumped out of the system through a different pipe. The sludge can be hauled off site, and the wash water can be discharged to vegetated areas or to a treatment plant. There are two types of oil/water separators, one that removes free oil that floats on top of water, and one that removes emulsified oil, a mixture of oil, water, chemicals, and dirt. Choose the separator that fits the needs of the vehicle wash facility. Each oil/water separator should be cleaned of all liquid and grit at least annually.
   - Once all free-floating petroleum products are absorbed, the liquid may be decanted to the municipal sewer system or to a tank, for final disposal at a waste water treatment facility or hazardous waste location.
   - If there is reason to believe that hazardous materials, other than oils, are in the liquid portion of the oil/water separator, then the Division Engineer/Manager must be notified and arrangements made by a licensed hazardous waste contractor to collect the liquid.
   - All grits are to be treated as special waste and disposed of at a special waste landfill (Norridgewock, Hampden, etc.)
o Once empty, oil/water separators must be filled with clean water above the bottom of the outflow pipe.

o Oil-only absorbent materials are to be used to capture free-floating oils that may accumulate in the oil/water separator.

**Management of High Risk Effluent**

Stewardship practice calls for both high risk and low risk effluent to be managed in one of the following ways:

1. Discharged directly to a municipal sewer system, with knowledge and permission of the local district.

2. Captured in a tank, then transported off-site for final disposal.
   - Highway/Bridge/Traffic Superintendents are to make arrangements for the transport and disposal of the tank contents with either a waste water treatment facility or hazardous waste contractor. Superintendents make arrangements for any analytical testing of the effluent, as may be required by the waste water treatment facility or hazardous waste contractor.
   - Within 4 days of a tank alarm sounding, Crew Supervisors should notify their Superintendent that the contents of a tank need disposal.
   - Bills of Lading, manifests, or other receipts for disposal should be kept at the Division Office for a minimum of 3 years.

1. Crew Supervisors should test the tank alarm system monthly. A log of such tests will be kept on-site for a minimum of three years.

2. The floor drain can be eliminated and the shape of the floor modified such that no liquids exit the garage through a drain system.

Further options exist and are detailed below for management of low risk effluent.

**Management of Low Risk Effluent**

In addition to the options available for high risk effluent, low risk effluent can also be managed in one of the following ways:

1. When Division Engineers/Managers choose to manage floor drain effluent by separation of activities and bays, the Division Engineer/Managers are to ensure that garage areas where activities could create High Risk liquid effluent are physically separated from the areas where activities create Low Risk liquid effluent. Physical separation includes walls and concrete or polyethylene berms. Berms should also be constructed in a manner that does not allow any waste that could be considered high risk to enter the areas where liquid effluent could be considered low risk. These berms must be constructed in a way that meets OSHA standards for tripping hazards (i.e. meet slope requirements of ADA and are striped as a hazard).

2. Captured in a melt-water only holding tank, pumped to the surface of the ground, and allowed to infiltrate only if the following conditions are met:
- Connection to a municipal sewer system is not an option.
- The infiltration area must be accessible for inspection.
- The effluent must not discharge directly into a ditch, stream, wetland, pond or other surface water body.
- There must be no significant potential for pollutants to drip, leak, spill or wash into the floor drains from which the effluent originates. Engine maintenance activities are prohibited from areas which feed floor drains discharging to pipes on top of the ground or melt-water only holding tanks. All containers of oils, engine fluids, cleaning products or other liquid pollutants must be removed or separated by means of an impermeable berm from the area containing the floor drain.
- Oil-only absorbent materials are to be used to capture free-floating oils that may accumulate in the melt-water only holding tank.
- Discharges must be done in a way that prevents erosion and the creation of pools of standing water. Discharge onto frozen ground is not allowed.
- Effluent must not be discharged within 300 feet of a private well or water intake or within 2500 feet of a public well or water intake.
- If there is reason to believe that the contents of the melt-water only holding tank has received oil, diesel or other hazardous materials due to a spill or leak, then the contents cannot be discharged on the surface of the ground. The contents of the tank must them be treated as high risk effluent and disposed of in a manner as described in the previous section.

1 Discharged directly from the floor drain onto the surrounding ground (daylighted) only if the following are met:
- Connection to a municipal sewer system is not an option.
- The pipe must discharge on top of the ground to an infiltration area that is accessible for inspection.
- The pipe must not discharge directly into a ditch, stream, wetland, pond or other surface water body.
- There must be no significant potential for pollutants to drip, leak, spill or wash into the floor drains. Engine maintenance activities are prohibited from areas which feed floor drains discharging to pipes on top of the ground or melt-water only holding tanks. All containers of oils, engine fluids, cleaning products or other liquid pollutants must be removed or separated by means of an impermeable berm from the area containing the floor drain.
- Proper erosion control methods are used at the end of the pipe.
- Effluent must not be discharged within 300 feet of a private well or water intake or within 2500 feet of a public well or water intake.
Floor Drain Maintenance and Sludge Removal

1 Supervisors at garages that contain floor drains are to ensure that floor drains are cleaned a minimum of once per year. The residue removed from the floor drains is assumed to be special waste. Bills of Lading for this disposal are to be kept at the Division Office for a minimum of three years.

2 Crew Supervisors should be responsible for ensuring that all floor drains, oil/water separators, and melt-water only holding tanks have oil absorbent socks maintained in them at all times. These petroleum socks, placed in the floor drains, oil/water separators, and melt-water only holding tanks, are to be changed when they show evidence that oil has been absorbed.

Holding Tanks and Maintenance

Environmental stewardship practice for holding tanks may include:

1 The minimum holding tank capacity must be 1,000 gallons.

2 Holding tanks and piping must be watertight and sealed with materials compatible with the liquid or sludge being stored.

3 Access must be provided to each compartment of the tank for inspection and cleaning by means of either a removable cover or manhole (minimum diameter 20 inches). Manholes must extend to finished grade.

4 The tank must be designed for the expected maximum structural load and ballast must be provided when necessary to prevent structural damage when the tank is emptied.

5 The volume between inlet cover and the maximum water depth must be equal to approximately 20 percent of the liquid volume stored below the maximum water depth. An alarm with both visual and audio signals must be activated once the water level reaches the maximum water depth.

6 A year-end record of pumping events should be produced each year the holding tank is in operation.

Leaks into Floor Drains

1 If, in the unlikely event, a spill or major leak occurs that allows petroleum or antifreeze liquid to enter a floor drain that was considered low risk, steps must be taken immediately to insure that none of the liquid contaminates the environment through the daylighted pipes, or, tank overflows. If contamination occurs, the steps for major spills must be followed.

Vehicle Washing

After a storm, equipment cleaned to reduce corrosion damage and to prepare for the next storm. Water used in washing cars, trucks, and other vehicles may contain a wide range of contaminants, including oil, other hydrocarbons, metals, detergents, road salt, and grit. Discharged into surface waters, these contaminants can degrade water quality and harm
aquatic life. Discharged into groundwater, potable water may be rendered unpotable. Various states (e.g., Georgia, Wisconsin, California, Virginia) are currently conducting studies designed to test the effectiveness of various structural BMPs and investigate the costs of design or purchase, as well as installation and maintenance. State DOTs are exploring some of the following options and environmental stewardship practices:

1. **Reduce the sources of potential contamination throughout the state by centralizing saltbed and truck washing at facilities already connected to POTWs amenable to accepting brine discharge.** This involves extra driving, and POTWs to which washing facilities are connected may have imposed limits on the volume of washwater or the levels of chloride and cyanide discharged from the facility. Washing facilities may be at such a distance from the others that moving trucks for washing is inconvenient or impractical, regardless of the cost; however, when usable facilities are accessibly located, this is a cost effective option.

2. **Connect every truck washing facility to an amenable POTW.** Costs of extending the line can be shared with other dischargers in some cases, though some facilities are too remote to make this a practical option.

3. **Contain wash water in holding tanks and haul to an amenable POTW.** INDOT found this is the most cost effective option for facilities that 1) cannot afford to connect to a POTW; 2) cannot discharge washbay effluent to a POTW because of prohibitions; 3) will install brinemaking equipment and can use washwater as “make-up” solution or 4) will continue to spread road salt for all or some snow/ice events. Vacuum trucks or bulk tank trucks (with a pump), if available, can be used to reduce hauling costs. While some POTWs will not accept transported liquids, a pick-up service might be arranged where amenable POTWs can be located.

4. **Line existing and newly constructed holding ponds with a clay layer or plastic impervious liner** and design the structure to hold the maximum volume of meltwater, washwater and precipitation that can conceivably collect while evaporation is depended upon to reduce the volume (no overflow is allowed).

5. **Install catch basins, settling tanks and holding ponds to remove suspended particles.** Dissolved chlorides cannot be removed in this fashion. According to an INDOT/Purdue study, the holding pond should be sized to hold the maximum volume of washbay effluent, surface area stormwater/meltwater runoff (unless the pond is bermed) and precipitation (roofing over a holding pond retards evaporation). Difficulties are encountered removing sediment from any holding pond, but especially one lined with plastic. Unless properly maintained, holding ponds can collect debris and serve as a harbor for algae blooms, wild fowl and reptiles. The cost of constructing a holding pond as a BMP must be weighed against the costs of cleaning and maintenance and the potential for groundwater contamination via a perforated or breached liner. Also, evaporation cannot be relied on to reduce the total volume contained because it is periodically replenished by precipitation. Prohibiting any discharge from a pond will mean that the contents will need to be pumped and hauled to an amenable POTW every other year; a longer cycle will increase the probability that no POTW would...
accept the contents because of the increased brine concentration. Alternatively, the unevaporated content can be pumped to tanks, if available, and used as brine makeup solution or hauled to another facility for this purpose.

Design and Operation of Washing Facilities

New Hampshire, Oregon, and other states have identified environmental stewardship practices for vehicle washing facilities. The following environmental stewardship practices can be added to existing and or new DOT facilities to minimize the potential for environmental contamination from polluted runoff:

1. **Warning signs should be posted for customers and employees instructing them not to dump vehicle fluids, pesticides, solvents, fertilizers, organic chemicals, or toxic chemicals into catch basins.** Catch basins are chambers or sumps which collect runoff and channel it to the stormwater drain or to the sanitary sewer. Vehicle wash facilities should **stencil warnings on the pavement next to the grit trap or catch basin.** All signs should be in a visible location and maintained for readability.

2. **Care should be taken to minimize wash water run-off from cleaning operations.**
   - Minimize water use to reduce potential for unpermitted non-stormwater discharges (e.g., provide a positive shutoff type of hose nozzle).
   - When possible, truck beds should be cleaned using a dry cleanup technique (sweep up or shovel out).
   - Use low pressure (brush and hose with nozzle only, no power booster or steam cleaning)
   - Exterior and frame wash only

1. **No detergents should be used,** as they emulsify oil in the oil/water separator and make the separator ineffective and may violate a DOT’s NPDES/SPDES permit by introducing new chemicals. Using alternative cleaning agents such as phosphate-free, biodegradable detergents for vehicle washing can also reduce the amount of contaminants entering storm drains.

2. **Where possible, indoor wash facilities with controlled floor drainage should be utilized.** Where wastewater is not to be disposed to a sanitary sewer, grassed swales (shallow, vegetated ditches) or constructed wetlands (retention ponds with emergent aquatic vegetation) can be used to hold wastewater and allow contaminant removal through infiltration and filtration.

3. **Washwater may otherwise be collected in a sump, grit trap, or containment structure to be pumped or siphoned to a vegetated area so that complete percolation into the ground occurs.** A portable collection system will provide the collection of the contaminants provided the collection system is large enough to capture significant amounts of the overspray. Washwater runoff can also be disposed of into an infiltration basin/trench. The use of a bioswale with an oil/water separator will virtually eliminate the total suspended solids, oil and grease, and heavy metals discharged provided both are properly sized.
vegetated cover, preferably grasses, a minimum of 250 feet in length before a surface water body. A distance of 250 feet was based on a hydraulic conductivity of 0.2 gal/ft/day, volume per day of 150 gallons, and a swale with a width of 3 feet.

- Complete percolation in the swale should occur with no direct discharge to the surface water. Discharge into a grassy swale for treatment should not occur within 24 hours after a rainfall event or if water remains ponded in the swale.

1. Wash areas should be located on well-constructed and maintained, impervious surfaces (i.e., concrete or plastic) with drains piped to the sanitary sewer or other disposal devices. The wash area should extend for at least four feet on all sides of the vehicle to trap all overspray. Enclosing wash areas with walls and properly grading wash areas prevent dirty overspray from leaving the wash area, allowing the overspray to be collected from the impermeable surface.

2. The impervious surfaces should be marked to indicate the boundaries of the washing area and the area draining to the designated collection point.

3. Washing areas should not be located near uncovered vehicle repair areas or chemical storage facilities; chemicals could be transported in wash water runoff.

4. Regularly inspect and maintain the designated areas, facility wash racks, designated cleaning areas, wash pads, clarifiers, oil-water separators, sumps and sediment traps. Regularly clean wash areas, grit traps, or catch basins to minimize or prevent debris discharge, such as paint chips, dirt, cleaning agents, chemicals, and oil and grease into storm drains or injection wells.

5. A washwater treatment sequence may include such elements as a grit trap, an oil/water separator, a dosing tank with siphons or pumps, and a multi-media filter bed with underdrains.

- Discharge from underdrains must meet effluent limitations.

- Maintenance of a multi-media filter should consist of cleaning, removing the top inch of sand once every six months; when the total depth of filter sand fall below 18-inches, the sand should be replaced. If clogging and/or short circuiting occurs as observed by uneven infiltration in the filter or formation of surface cracks, the sand should be replaced.

- A Spill Prevention, Control and Countermeasure (SPCC) Plan, in accordance with 40 CFR 112, should be prepared and implemented to prevent the entry of pollutant loads beyond the capabilities of the treatment system.

1. Contractual provisions should require contractors to use cleaning practices consistent with DOT requirements.

Recycling Wash Water
Recycling systems reduce or eliminate contaminated discharges to stormwater drains and injection wells by reusing the wash water until the water reaches a certain contaminant level. The wastewater is then discharged to a collection sump or to a treatment facility.
Collection sumps are deep pits or reservoirs that hold liquid waste. Vehicle wash water accumulates in the collection sumps, and is pumped or siphoned to a vegetated area (such as a grassed swale or constructed wetland). Sediment traps can also be used to strain and collect the vehicle wash water, prior to pumping or siphoning the wash water to a vegetated area. The use of a recycling system can reduce or eliminate the contaminant discharge to stormwater or sanitary sewer while greatly reducing the amount of water used in the process. Some DOTs are installing brinemaking at truck washing facilities so washwater can be used as “make-up” solution. This solution can also be used to “spray the load” of salt/sand mix and/or to fill saddle tanks for spraying the mix as it passes through the salt spreader. The cost of brinemaking equipment is relatively affordable, though adding brine application equipment to existing trucks is more costly.

A recycled wash water has been successfully used by one of the largest bus transport companies operating in Borsod County, Hungary. In 1985, they installed a new, water-saving wastewater treatment facility for wastewaters resulting from washing at the central service plant. The commercial transportation system uses detergent-free, high pressure, hot water to remove dirt and grime from the car bodies and engines of the buses. The resulting wastewater is mechanically treated with filters consisting of sand and activated carbon. For disinfection, a 1 to 3 mg/l NaOCl solution is used. The filters are backwashed with recycled water every 3 to 4 days. The polluted backwash water is returned to the treatment plant. Oily rainwater from the yard is also directed into the treatment plant. The system uses fine sand filtration after pretreatment of the wastewater to remove grit, sand and oil. After this pretreatment, about 15 percent to 20 percent of the wastewater is discharged into a conventional sewerage system. This discharge prevents the accumulation of TDS and organic substances in the remaining water which is recycled for use in the carwash. This discharged water meets the water quality requirements for all categories. The remaining water that is to be recycled is subjected to ozonation to prevent anaerobic digestion of organic materials which produces foul odors. After ozonation, the remaining, pretreated water is conveyed through a fine sand filter by pump. Once filtered, the water is resupplied to the carwash by means of a rubber membrane hydrophore at a pressure of between 2 and 8 bar. For the commercial vehicle washing recycling facility, the initial investment costs are about $80,000, with a further investment of $1,600 for reconstruction after about ten years of operation. Maintenance costs were about $4,000/year. The estimated period for recovery of this investment is about 1.3 years based upon typical usage within the region. The technology achieved 80 percent recycling of water.

In addition to the recycling of washwater, environmental stewardship practices associated with recycling washwater include:

1. Recycling treatment equipment should be properly operated and maintained to achieve compliance with all conditions of the permit.
2. Backwash water or concentrate water should be properly discharged to sanitary sewer.
3. Liquid concentrate discharged to the sanitary sewer should meet all pretreatment standards and other requirements of the local Sewer Authority.
4. Solids, grit, or sludge should be disposed in a manner that complies with State administrative rules.
6.4 Energy Conservation

Nova Scotia, Canada is one of the North American transportation agencies on the state or province level that has taken a serious look at energy conservation practices on the facility level. The Nova Scotia Department of Transportation and Public Works (NSTPW) reports in their practice guide that in 1996, electricity generation accounted for 40 percent of Nova Scotia’s greenhouse gas emissions. Nova Scotia is participating with the federal government and the other provinces and territories in developing the National Climate Change Strategy for Canada. Toward this effort and implementation of the agency’s EMS, NSTPW is seeking to:

1. Reduce activities which use electricity
2. Improve efficiency both in the distribution of electricity and in the consumption of electricity by energy users
3. Use less carbon-intensive forms of electricity generation.

Energy use at TPW locations can be broken into four categories: HVAC systems, lighting, water heating, and office equipment. Space and water heating alone was estimated to be responsible for up to 35 percent of energy use in office buildings. The New York City Transit Agency has been a national leader among transportation and other public agencies in the U.S. in Green Building design and operation, which includes design and operation for energy efficiency.

Planning for Energy Conservation

1. Conduct an energy audit to determine how much energy is being consumed at your location; break down the results by category of energy use if possible (e.g., heating, cooling, pumps and fans, lighting, receptacle loads, etc.).
2. Establish goals for the overall energy consumption of the building or renovated area. These goals should be broken down by category of energy use. Inform employees of these goals.
3. Organize electrical services to permit sub-metering of energy use by category: cooling, pumping, fans and heating, plug loads, etc.
4. Collect and analyze sub-metered energy data on a regular basis; compare results to goals for each category.
5. Consider alternative heating sources such as ground-source heat pumps, geothermal heat pumps, solar or other renewable energy sources.
6. Provide employees/occupants with information on how they use energy and what they can do to reduce their energy use.

Heating, Ventilation and Air Conditioning (HVAC)

1. Address leaks and poor insulation in HVAC ductwork.
2. Develop operating manuals for all equipment including design intent, set points,
setback and setup schedules, on/off time schedules, special features and requirements, etc.

3 Develop maintenance manuals for all HVAC equipment with schedules and frequency of service required.

4 Ensure heating and cooling are on different schedules and that it is not possible to have the two operating coincidentally.

5 As office schedules change, ensure time schedules for ventilation fans, purge cycles, heating and cooling are changed to match building occupancy.

6 Provide preventative maintenance checks annually to ensure all HVAC systems are operating properly; make any necessary repairs.

7 Carry out an annual calibration and check the function of all building automation systems to verify operation and performance.

8 When demand controlled ventilation systems are used, carbon dioxide sensors must be calibrated annually to ensure proper function.

9 Ensure service technicians provide detailed listings of all service performed and findings made. Ensure all changes to equipment are documented and all parties affected are informed.

10 Records for inspections and repairs should contain:
   o Date of inspection and/or repair.
   o Inspection company and/or persons contact information.
   o Details of work completed, including costs.
   o Date for next inspection.
   o Any malfunctions of system found during inspection and/or repair.

**Lighting Efficiency**

Technologies developed during the past 10 years can help cut lighting costs 30 percent to 60 percent while enhancing lighting quality and reducing environmental impacts.

1 Turn lights off when not needed and ensure that occupancy sensors have not been overridden.

2 Have the cleaning and maintenance schedule overlap with regular hours to minimize energy use. After hours work should be done by area, using only necessary lights (task lighting).

3 Introduce local task lights (e.g. desks lights), allowing a reduction in general overhead lighting.

4 Keep light fixtures clean as dust greatly decreases the amount of light delivered.

5 Specify single bulb and fluorescent, mercury-free fixtures to replace incandescent ones at the end of their useful life; use the most energy efficient lamps and
Consider group relamping. Common lamps, especially incandescent and fluorescent lamps, lose 20 percent to 30 percent of their light output over their service life.

Replace all the lamps in a lighting system at once. This will save labor, keep illumination high, and avoid stressing any ballasts with dying lamps. It is useful to keep a record of the type of bulbs used and when they are replaced. This allows for long-term monitoring of the efficiency and life span of different types of lighting in different areas.

Ballasts - standard choke ballasts can be replaced by high frequency electronic ballasts. Electronic ballasts are highly recommended for use with low-voltage tungsten-halogen lamps, high-efficacy argon-krypton filled fluorescent tubes, metal-halide and high pressure sodium lamps. Electronic ballasts offer the following advantages:

- 20 to 30% energy reduction compared with conventional ballast
- 50% longer service life of lamps
- Absence of flicker (ballast operates lamp at a frequency between 22 and 70 kHz)
- Silent operation
- Net power factor of 0.95 to 0.99
- Low harmonic distortion
- Overvoltage protection
- Automatic switch-off of faulty or end-of-life lamps
- Reduction in weight
- Cool operation.

Automatic control systems:

- Timer circuits that switch lamps off during room vacancy times
- Photoelectric sensors that sense the amount of daylight in the room and either switch lamps on or off or adjust the lamp brightness accordingly
- Occupancy sensors that switch lamps off when work stations are unoccupied.

Computer Equipment

Computers, printers, photocopiers and fax machines are the greatest contributors to office paper waste and energy consumption.

Enable energy saving options on computers, monitors, printers, photocopiers, etc.
2. Turn all equipment off when not in use (both day and night); this will also increase equipment lifetime.


4. Buy printers and photocopiers that can do double sided printing or reduce page size to fit two pages on one side.

5. Ensure that printer and toner cartridges can be returned and recycled by the manufacturers.

6. Choose equipment based on its efficiency and operating costs over time; only buy office equipment that has the Energy Star or Environmental Choice, EcoLabel. Ensure that the Energy Star program is initiated when equipment is first installed.

6.5 Under and Above-Ground Storage Tanks

Above ground storage tanks are used at Maintenance facilities to store fuel, oil, antifreeze, deicing agents and asphalt emulsion. Underground tanks most often contained fuel. These materials can pose potential threats to water quality if spilled or mixed with stormwater runoff. Many DOTs have removed underground storage tanks for petroleum products, except at major facilities, and replaced these with above ground tanks or credit cards to purchase fuel private sources. Environmental stewardship practices for preventing and addressing storage tank leaks and spills include those reviewed below.

Tank Registration Practices

Fuel/petroleum tanks are generally registered with the state environmental agency when they can hold in the range of more than 1,100 gallons in a total combined capacity of any aboveground and/or underground tanks which store petroleum products, gasoline, diesel, kerosene, used oil or heating fuel. All fuel/petroleum tanks storing used oil are registered regardless of tank size or site capacity. One exception to this registration requirement -- small tanks that are not manifold and hold less than 1,100 gallons of heating oil for on-site use are exempt from this regulation. ()

1. Petroleum Bulk Storage (PBS) Registration certificate should be posted near the tank location and renewed every five (5) years.

2. The PBS certificate should be updated whenever a tank removed or modified or added to reflect all current tanks.

3. The state environmental agency is notified prior to any tank removals.

Tank Equipment and Recordkeeping Practices

1. In both aboveground and underground petroleum storage tanks color-coded fill ports are used per the American Petroleum Institute’s color and symbol code.

2. In both aboveground and underground petroleum storage tanks the color and symbol code is identified on each fill port.

3. Typical DOT petroleum storage tank port colors and codes are: Diesel - Yellow; Unleaded Gasoline - White with Black Cross; Kerosene – Brown.
4 In both aboveground and underground petroleum storage tanks operating valves are present on all gravity-drained tanks

5 In both aboveground and underground petroleum storage tanks automatic shut-off valves such as solenoid valves on gravity-fed systems and shear valves on pumped dispensing systems are present to prevent any leaks in case of a pipe or hose failure

6 In both aboveground and underground petroleum storage tanks check valves are present for backflow prevention on tanks filled by pumping

7 For underground petroleum tanks monitor the inventory by measuring use, deliveries, losses or gains, and bottom water levels daily.

8 For underground petroleum tanks record inventories to the nearest tenth of a gallon if feasible,

9 For underground petroleum tanks reconcile records every ten days and retain all records for at least five years.

10 For underground petroleum tanks report inventory losses or gains of product that are more than:
   o 0.75 percent of the tank volume in a ten day period
   o 7.5 gallons for every 1,000 gallons delivered over a ten day period or 0.75 percent of the throughput or amount dispensed over a ten day period
   o Or if water seems to be accumulating during any ten (10) day period

1 When the cause of losses or gains in underground petroleum tanks cannot be explained within 48 hours, the Department of Environmental Conservation’s Regional Spill Engineer is contacted and the tank is taken out of service

2 Tightness testing is required every five (5) years when underground tank systems are not protected and hold more than 1,100 gallons. (Protected systems are those that were installed with corrosion-resistant tank and piping and a leak monitoring system)

3 For underground petroleum tanks monitor corrosion-resistant tanks and pipes at the manufacturer’s recommended schedule.

4 Steel USTs with corrosion protection should comply with the following requirements to ensure that releases due to corrosion are prevented for as long as the UST is used to store regulated substances.

5 For underground petroleum tanks inspect leak detection systems or double-walled tanks at least weekly, and other monitoring systems monthly

6 For underground petroleum tanks check any cathodic protection systems at least annually

7 Tanks (tanks for on-site heating are exempt) that hold 110 gallons or more are required upgrade to meet federal underground tank storage requirements. These federal standards included leak detection systems, corrosion protection, and
8 For aboveground petroleum tanks inspect monthly the exterior surfaces of tanks, pipes, valves, leak detection systems and other equipment to identify any cracks, wear, corrosion, settling, separation or other problems. Keep records with the date and signature of the inspector for ten (10) years.

9 For aboveground petroleum tanks perform secondary containment and internal inspections every ten (10) years conducted by qualified firms for any tanks of greater than 10,000 gallon capacity that rest on the ground. Secondary containment may be required for smaller tanks that could reasonably be expected to discharge to waters of the state.

10 For aboveground petroleum tanks gauges accurately showing the product level are present unless a high level alarm or a cutoff controller is present. The design and working capacities and tank identification number must be clearly marked on the tank and at the gauge.

11 Erosion is the main concern with earthen emergency spill containment. Dried weeds and grass present a fire hazard. Animals can burrow through earth dikes. Concrete structures are susceptible to cracking and frost damage. A weekly inspection schedule should be developed to address these problems so they can be repaired promptly. Individual site-specific checklists should be developed to reflect site specific concerns. The following is a list of key items to be addressed in the periodic inspection of ASTs. Each AST should be inspected at least weekly.

   o Presence and/or volume of oil or water in the containment area
   o Soil color changes; noticeable sheen on water puddles
   o Visual observance of tanks, pumps, valves, and pipe connections
   o Unusually strong odor of stored material
   o Storage tank overflowing
   o Determination of accumulated liquids contained in area (i.e. uncontaminated stormwater, contaminated runoff, or pure product.)

1 New UST systems should be properly installed in accordance with industry codes of practices. At a minimum, new underground storage tank systems including piping should be:

   o Properly designed, constructed, and protected
   o From corrosion
   o Equipped with leak detection devices
   o Equipped with spill/overfill protection
   o Installed by a state certified installer
   o Inspected by a state certified inspector during installation
Record keeping is necessary to ensure compliance with the federal, state, and local regulations. Records of a tank system should be maintained for the operating life of the system and at least 5 years after its permanent closure. The original documents should be maintained on site, if possible. The following records are often necessary to document appropriate environmental stewardship:

- Inventory Records
- Installation Details
- Modification/Repair Details
- Operation Records
- History of usage
- Physical inspection checklists/reports
- Monitoring records
- Leak/incident documentation
- Tank Handling Activity Report
- Legal Records
- Permits, notifications, and certificates
- Agency correspondence
- Consultant/Contractor Reports
- Engineering assessments/surveys
- Tank and line testing results
- Environmental sampling results
- UST Inspection Report
- Tank Closure Records
- UST Closure Notification Form
- UST Closure Report Form
- Registration of Storage Tank Form
- Notification of Reportable Release/Notification of Contamination

Prior to releasing rainwater from secondary/spill containment of an AST, inspect the water for contamination. If there is evidence of spilled or leaked material, or captured rainwater in the spill containment exhibits a surface sheen, contact the District Stormwater Coordinator or District Hazmat Manager for appropriate actions to be taken.
2 Make sure the drain valve or plug is properly secured to contain any future leaks or spills.

3 Be prepared to respond in the event of a leak or spill from an above ground tank:
   o Maintain an appropriate spill kit near each above ground tank.
   o Replenish spill kit supplies as they are used.
   o If the type of material being stored changes, replace spill kit contents with supplies appropriate for the new material.

1 For cleaning spilled materials, particularly hazardous materials, follow procedures from the product MSDS (Material Safety Data Sheet) or the North American Emergency Response Guidebook (Federal DOT document).


**Vehicle and Equipment Fueling Procedures and Practices**

Vehicle and equipment fueling procedures and practices are designed to minimize or eliminate the discharge of fuel spills and leaks into stormwater drainage systems or watercourses during equipment fueling and the bulk delivery of fuel.

**Bulk Fuel Delivery**

1 All aboveground and underground storage tanks should be equipped with automatic overfill shutoff valves.

2 Spill Prevention and Control BMPs should be implemented to prevent spillage.

**Fueling Area Maintenance**

1 Label drains at fuel dispensing areas to indicate if they discharge to the storm drain or to the sewer.

2 Storm drain inlets may be temporarily covered with spill pads and/or mats during fueling operations.

3 Absorbent spill cleanup materials or drip pans should be stored in fueling and maintenance areas and used materials should be disposed in accordance with hazardous waste management BMPs.

4 Immediately clean up leaks and drips.

5 Hosing off the fueling area is prohibited. Dry shop clean up practices should be used.

6 Manage wastes to reduce adverse impacts on stormwater quality. Fueling areas should be kept free of litter and debris that might become contaminated with petroleum products.

7 Maintain and implement a current spill response plan for fueling operations.
8 Inspect fueling facilities daily and correct deficiencies.
9 Keep a supply of spill cleanup materials on site.

**Refueling Practices**

1 Fueling operations should not be left unattended. Fueling in the field should not be performed near unprotected drainage facilities or watercourses. See Spill Prevention and Control BMPs.

2 Drip pans should be used during vehicle and equipment fueling unless the fueling is performed over an impermeable surface in a dedicated fueling area. Dedicated fueling areas should be protected from stormwater run-on and runoff and should be located at least 15m from downstream drainage facilities or watercourses.

3 Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips.

4 Warnings against “topping off” fuel tanks should be posted at fuel dispensers.

5 Fueling operations should not be left unattended.

6 Absorbent spill cleanup materials should be available in fueling and maintenance areas and should be disposed properly after use.

7 Vehicles and equipment leaks should be inspected and cleaned up on each day of use.

8 Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.

A SPCC Plan outlining procedures and measures to prevent and respond to a petroleum spill is required if:

1 The underground tanks at the facility can store more than 42,000 gallons
2 660 gallons or more can be stored in a single aboveground tank
3 1,320 gallons or more can be stored in some combination of smaller aboveground tanks,
4 Portable containers (i.e., drums), and oil filled equipment or transformers.

**Stewardship Practices for Known or Suspected Groundwater Contamination On-Site**

The potential for groundwater contamination raises the need for action at a site to a high priority level. The RCRA environmental indicator for controlling migration of contaminated groundwater requires the following documentation: ()

1 Consideration of all available, relevant or significant information on known and suspected releases to the groundwater at the facility;

2 Determination whether groundwater is contaminated above appropriately protective levels (i.e., applicable promulgated standards, other appropriate
standards, guidelines, guidance, or criteria) anywhere at, or from, the facility;

3. Determination whether the migration of contaminated groundwater has stabilized (remains within the previously determined existing area of contamination);

Environmental stewardship of suspected groundwater contamination from runoff at maintenance sites or other DOT facilities should include the following, which parallel environmental indicators used by EPA to measure progress toward groundwater remediation at RCRA sites subject to corrective action. ()

1. Where groundwater contamination is known or suspected, the DOT controls the migration of contaminated groundwater plumes, through:

   o Consideration of all available, relevant or significant information on known and suspected releases to the groundwater at the facility.

   o Determination whether groundwater is contaminated above appropriately protective levels (i.e., applicable promulgated standards, other appropriate standards, guidelines, guidance, or criteria) anywhere at, or from, the facility.

   o Determination whether the migration of contaminated groundwater has stabilized (remains within the previously determined existing area of contamination).

   o Determination whether contaminated groundwater discharges to surface water.

   o Determination whether any discharge of contaminated groundwater to surface water is “significant” (the maximum concentration of the contaminant in the surface water is more than ten times the appropriate groundwater level).

   o Determination whether the discharge of contaminated groundwater into surface water is “acceptable” until a full assessment and a final remedy decision can be made. Factors to be considered in the interim assessment include surface water body size, flow, use/classification/habitats, contaminant loading limits, other sources of surface water/sediment contamination, effects on ecological receptors (e.g., via bio-assays, benthic surveys or site specific ecological risk assessments performed by trained specialists).

   o Decision whether groundwater monitoring measurement data and surface water/sediment/ecological data will be collected in the future to verify that contaminated groundwater has remained within the existing area of contaminated groundwater.

1. Where groundwater contamination is known or suspected, the DOT controls human exposure to contaminated groundwater, through:

   o Consideration of all available relevant or significant information on known and suspected releases to soil, groundwater and surface water at the facility.
- Determination whether the soil, groundwater or surface water is contaminated above appropriately protective risk-based levels.

- Determination whether there are complete pathways between contamination and human receptors such that exposures can be reasonably expected under the current land, groundwater and surface water use conditions.

- Determination whether the exposures resulting from the complete pathways (above) are “significant.” Here, “significant” means: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the “acceptable levels” used to identify the contamination, or 2) the combination of exposure magnitude (perhaps though low) and contaminant concentrations (which may be substantially above the “acceptable levels”) that could result in greater than acceptable risk.

1 The design and implementation of Best Management Practices is a DOT priority at sites where contaminated groundwater is suspected, in order to prevent further degradation and, possibly, migration to surface water, including sources of drinking water.

This documentation meets or exceeds that required by the Phase I Environmental Site Assessment Standard (ASTM E 1527-00), which may be utilized at some sites, and can serve as the foundation for further, Phase II investigations of “recognized environmental conditions” (RECs) identified during Phase I assessments.