



Operation and Maintenance (O&M) Manual

for:

Springville Street Division

Revised July, 2016

**Street Department
Operation and Maintenance (O&M) Manual**

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Street Division Operation and Maintenance (O&M) Manual

I. Introduction

This manual is designed to assist Springville City personnel on how to properly implement Best Management Practices (BMP's) on City owned facilities and field activities as part of the municipal stormwater management program.

This manual will identify the potential pollutants and activities that can contribute to the pollution of storm waters as well as the BMP's used to ensure that the potential for these pollutants affecting storm water is diminished to the maximum extent practicable.

II. Potential Pollutant Sources

A variety of pollutants are associated with stormwater pollution due to municipal activities including: sediment, nutrients, bacteria and viruses, oxygen demanding substances, oil and grease, metals, toxic pollutants and floatables (Table 1). The impacts of these pollutants on water quality along with a discussion on municipal activities which can potentially contribute to their introduction into stormwater runoff are presented in the following subsections.

- A) Sediment. Sediment is a common component of stormwater, and is considered to be one of the most damaging pollutants in Utah. Sediment fills in streams, lakes, rivers, wetlands and road drainage ditches, and can affect aquatic life by smothering fish larvae and eggs. Suspended soil particles can cause water to look cloudy or turbid. Excessive turbidity reduces light penetration in the water, impairing the sight of feeding fish; clogs fish fills, and increases drinking water treatment costs. Fine sediment also acts as a vehicle to transport other pollutants including nutrients, trace metals and hydrocarbons to nearby surface waters. Significant sediment-borne pollutants are associated with highway runoff; originating from pavement wear, vehicles and other road maintenance. Other sources of sediment include erosion from new development and construction sites.
- B) Nutrients- nutrients, especially nitrogen and phosphorus, can cause algae blooms and excessive aquatic plant growth in water bodies. These conditions can impair many important uses of these waters, including recreation, fish habitat, and water supply. Nitrogen and phosphorus associated with stormwater runoff come mostly from fertilizer application. Phosphorus has also been associated with application of sand and salt of roads. Nutrients are a result of yard debris, garbage, as well as fertilizer and pesticide use.
- C) Metals- Trace metals are a water quality concern because the toxic effects they can have on aquatic life. Metals can also be a health hazard to humans through direct ingestion of contaminated water or through

eating contaminated fish. The most common trace metals found in stormwater runoff in urban areas are lead, zinc, copper, cadmium, nickel and other metal sources originating from body rust, brake lining wear steel highway structures, tire wear, steel fabrication and vehicle maintenance.

- D) Oxygen-demanding substances- oxygen-demanding substances tend to deplete the dissolved oxygen levels in streams and lakes. The depleted oxygen supply can result in the reduction of aquatic life. Oxygen-demanding substances are found in yard waste (such as leaves and lawn clippings), animal wastes, street litter and organic matter.
- E) Bacteria and Viruses- bacteria and viruses are the most common microorganisms found in surface water runoff. Bacteria and viruses often carry diseases which can be transferred to animal life and to humans. The main sources of these contaminants are animal excrement and sanitary sewer overflows.
- F) Oil, Grease and Hydrocarbons- oil grease and hydrocarbons contain a wide array of compounds, some of which are toxic to aquatic organisms at low concentrations. The main sources of oil and grease are leakage from engines and waste oil disposal. Hydrocarbons typically come from spills, leaks, lubricants and asphalt surface leachate. Hydrocarbon levels are highest from parking lots, roads and service stations.
- G) Floatables- floatables (garbage) are pollutants that may be contaminated with heavy metals, pesticides and bacteria. Typically resulting from street refuse or industrial yard waste, floatables also create an eye sore in water ways and detention basins.

Pollutant	Source	Impacts
Sediment	Construction sites, vehicle/boat washing, agricultural sites	Destruction of aquatic habitat for fish and plants, transportation of attached oils, nutrients and other chemical contamination, increased flooding. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter.
Nutrients (Phosphorus, Nitrogen Potassium, Ammonia)	Fertilizers from agricultural operations, lawns and gardens; livestock and pet waste, decaying grass and leaves, sewer overflows and leaks.	Harmful algal blooms, reduced oxygen in the water, changes in water chemistry and pH. Nutrients can result in excessive or accelerated growth of vegetation, resulting in impaired use of water in lakes and other receiving waters.
Hydrocarbons (Petroleum Products, Benzene, Toluene, Ethyl benzene, Xylene)	Vehicle and equipment fluid leaks, engine emissions, pesticides, equipment cleaning, leaking fuel storage containers, fuel spills, parking lot runoff	These pollutants are toxic to humans and wildlife at very low levels. Carcinogenic. Teratogenic.
Heavy Metals	Vehicle brake and equipment wear, engine emissions, parking lot runoff, batteries, paint and wood preservatives, fuels and fuel additives, pesticides, cleaning agents	Metals including lead, zinc, cadmium, copper, chromium and nickel are commonly found in stormwater. Metals are of concern because they are toxic to all life at very low levels. Carcinogenic. Teratogenic.
Toxic Chemicals (Chlorides)	Pesticides, herbicides, dioxins, PCBs, industrial chemical spills and leaks, deicers, solvents,	Chemicals are of concern because they are toxic to all life at very low levels. Carcinogenic. Teratogenic.
Debris/Litter/Trash	Improper solid waste storage and disposal, abandoned equipment, litter	Aesthetically unpleasant. Risk of decay product toxicity. Risk of aquatic animal entrapment or ingestion and death.
Pathogens (Bacteria)	Livestock, human, and pet waste, sewer overflows and leaks, septic systems	Human health risks due to disease and toxic contamination of aquatic life.

Table 1 Potential pollutants of concern associated with municipal activities.

Sources of Pollution	Check with an X the activities that apply	Sediment	Nutrients	Heavy Metals	pH (acids and bases)	Pesticides & Herbicides	Oil & Grease	Bacteria & Viruses	Trash, Debris, Solids	Other toxic Chemicals
Clearing, grading, excavating, and un-stabilized areas	X	✓							✓	
Paving operations	X	✓					✓		✓	
Concrete washout, stucco and cement waste	X			✓	✓				✓	
Structure construction, painting, cleaning	X			✓	✓				✓	✓
Demolition and debris disposal	X	✓							✓	
Material Delivery and storage	X	✓	✓	✓	✓		✓		✓	✓
Solid waste disposal	X								✓	✓
Hazardous Waste, contaminated spills	X			✓	✓	✓	✓			✓
Sanitary waste			✓		✓			✓		
Vehicle/equipment fueling, maintenance, use and storage	X			✓			✓		✓	✓
Landscaping operations	X	✓	✓			✓			✓	✓
Vehicle washing	X	✓	✓	✓			✓			

III. Facilities Locations, Activities and Control Measures

1. City Operations Compound (High Priority)

Location- Located at 909 East 400 South is shared with the Parks, Water, Recreation and Fleet Departments.

Activities- The Street Department yard area of the compound is used for employee and equipment parking, salt and cold patch asphalt storage.

The Street Department buildings are used for service truck parking, and traffic control signs and supplies storage. The most common supplies stored in the buildings are:

Spray paint	Oils	Window washing fluid
Antifreeze	Grease	Brake fluid
Brake cleaning spray	Penetrating oil spray	Paint
Road marking paint	Gasoline	

Outdoor Storage area includes the following materials:

Excavated materials	Road salt	Asphalt cold mix
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Control Measures SOPs

General Cleanliness

- Trash and litter are to be picked up from work areas daily.
- The yard will be walked to pick up and dispose of litter weekly
- The paved surfaces around the building will be swept as needed.

Vehicle and Equipment Parking Areas

- Vehicles and equipment will be parked on the approved designated areas
- If any leaks are discovered, a drip pan will be used to collect the fluids and vehicle will be scheduled for repairs.
- Any leaks or spills that do wind up on the pavement will be cleaned using dry methods (absorbent material, sweep when dry and dispose in the garbage can) Spill prevention kit.

Material Handling

- Salt pile is covered; the material spilled onto the asphalt during transportation is pushed back on to the pile. No more than 300 cubic yards are stored at this facility at any one time.
- Cold patch asphalt pile is contained on 3 sides by a concrete block wall; no more than 13 tons of asphalt is stored at this facility at any one time.
- Hazardous chemicals (listed above) are stored indoors, neatly organized and properly labeled.

- All buildings that have floor drains are connected to the sanitary sewer.

Vehicle and Equipment Cleaning Areas

- No washing is allowed outdoors.
- There are no wash facilities at this location. All major washing is done at the local commercial carwashes, the waste water reclamation facility drying beds or at the Electrical Department wash bay.
- Minor washing is done inside the shop, floor drains go to the sanitary sewer.
- Snow removal equipment is washed at the waste water reclamation facility drying beds.

Vehicle and Equipment Maintenance Areas

- All major repairs and maintenance activities are conducted by the Fleet Department.
- Activities such as adding oil to engines, transmissions and differentials are done indoors.
- Oils and other automotive fluids are neatly and cleanly stored. Oil drums are placed on a containment spill deck.
- Equipment that is stored outside will be inspected prior to use to make sure that all drips are contained and/or repaired.

2. Rodeo Grounds

Location

1600 South 700 West, the rodeo grounds parking lot is used by the street department to store Road base, the parking lot consists of compacted road base, the site doesn't have a storm drain system. An irrigation ditch runs on the East side and crosses the property on the North, the water flows to the west and it eventually drains into dry creek. Most of the rain is absorbed by the ground the rest of it flows to the North West of the property where it evaporates.

Activities

The Rodeo grounds are used by the Street Department to store road base, and rock chips.

Potential pollutants related with the activities at this location include:

Sediment, garbage, hydrocarbons (e.g. oil, fuel, etc)

Control Measures SOPs

- Vegetated buffer- is preserved between the parking area and the irrigation ditch.
- Material piles are located at least 40' away from the vegetated buffers
- Earthen berm- surrounds the property to keep storm water from leaving or entering the site.
- Stabilized tracking pad- compacted road base will be maintained in good working condition to keep vehicles from tracking mud on to the street.
- Street sweeping- the street will be swept as needed.
- Dust control- water will be applied to the road base parking lot as needed to keep dust down.

3. Fill Site

Location

2200 S 700 W, the "Fill Site" is used by the street department to stock pile materials. The land drains towards center of the property where any storm water runoff will collect and it will evaporate or infiltrate into the ground.

Activities

The Street Department uses this site to stock pile raw and excavated materials, excavated materials (concrete, asphalt and dirt) are separated, asphalt and concrete are taken to a recycling facility, the dirt is used to fill low lying areas of the property or future City projects; The raw materials are stockpiled and contained with concrete block walls, any runoff from these containment bins drain to the center of the property.

Control Measures SOPs

- Buffer strip (earth berm) - the area will be graded such that all runoff will be contained in the middle of the sorting area, a buffer zone slopes water to the center of the material sorting area.
- Waste disposal- Concrete and asphalt will be taken to a recycling facility.
- Stormwater detention- there is no impervious surfaces at the site, the storm water that doesn't get absorbed will evaporate.
- Tracking Pad- 2" fractured gravel, 16' wide by 50' long installed at exit point to limit the amount of mud leaving the site.

IV. Field Activities and Control Measures SOPs

- Street signs- new installation and replacement of signs is an ongoing activity in the City. A very small area is disturbed by the installation of an anchor system. They come pre fab to install, other than bolts. **BMP's**- street and gutter cleaning
- Snow removal and de-icing- snow is pushed immediately after a snow storm and only hills and intersections are salted. **BMP's**-Crews only use salt on hills and intersections. Employee training on salt management and snow removal practices is done before the snow season; any accidental dumping of salt will be immediately removed.
- Snow equipment set up- preparing the trucks for snow removal includes cleaning trucks beds, installing cinder machines and hooking up the snow plows, electrical and hydraulic lines, oil and grease trucks and sanders; replenish salt pile. **BMP's**- Spill kits are on hand in the shop, and any cleaning of truck beds is disposed of properly. Employee training on fuel spills, spill clean up, sweep floors.
- Creek management- Flood control, remove debris, cutting downed trees, use of line truck to remove debris from the creeks; a back hoe is also used to load debris and remove beaver dams. **BMP's** employee training on preserving vegetation, channels is not altered and debris is taken to the dump.
- Concrete work- repair gutters and sidewalks, grind trip hazards, remove and replace concrete sections. **BMP's**- Concrete mixers are washed out at the public works sewer plant, concrete dust from grinding activities is swept and removed from the site. All removed concrete is disposed of at recycling facilities.
- Storm drain maintenance- prior to stormy weather, crews are sent out to clean debris off from grates and screens. **BMP's**- these debris are then taken to the waste water treatment facility to let dry in the drying beds and after the waste dries it is taken to the Springville transfer station.
- Potholes- A small amount of asphalt is purchased from local companies and applied to potholes as needed that day. **BMP's**- sweep streets and gutters, employee training on spill clean up and response, house keeping practices. All asphalt removed is disposed of at recycling areas.
- Road maintenance- patching, overlays, crack seal, slurry coating, fog and chip seal, shouldering and mowing. Some of the work is done by subcontractors. **BMP's**- sweep streets and gutters, employee training on spill clean up and response, house keeping practices. All asphalt removed is disposed of at recycling areas.
 - Patching- area to be patched is excavated and the material is loaded onto a truck, any road base that was displaced from the patch area is also removed, tack oil is applied to the asphalt edges, asphalt is installed and area is swept.
 - Chip seal- man holes, and water valves are covered to prevent oil from getting inside the man hole. **BMP's**- employees are

- trained on spill response, street sweeper is used to pick up excess chips.
- Slurry seal- this activity is done by a subcontractor. The street department crew removes weeds from the road; the roads are then swept with a street sweeper and water is sprayed on the road to remove dust left over by the sweeper. **BMP's** Street sweeping, storm drain inlet protection, subcontractor is trained on spill reports.
 - Shouldering and mowing- roads with out shoulder curbing are graded to clear vegetation 3' away from the asphalt edge, vegetation past the 3' graded area is mowed down. Streets sweeper is used to clean up weeds & dust in the street after.
 - Street and curb painting- All areas that require markings are done once a year with an oil base paint. Painting is done with sprayers, rollers and brushes. **BMP's**- equipment is cleaned with solvent indoors, this solvent is captured in a 5 gallon buckets after each use and recycled, any solvent that winds up on hard surfaces is cleaned up using dry methods. Some work is done by subcontractors including all centerlines.
 - Street sweeping- a sweeping schedule has been prepared to sweep every street on the city at least once per year. The city sweeps highly affected areas continually to keep streets clean; the sweeper truck also assists on emergency spill clean up, car wrecks, storm damage response, chip seal and slurry seal activities, road projects city parking lots, after parades and city clean up projects. **BMP's**- loads collected are taken to the Waste Water Treatment Facility and are dumped on the drying beds, once the pile is big enough, it is loaded on a 10 yard dump truck and hauled away to the Land fill.
 - Secondary road maintenance- gravel and dirt roads to water tanks and other service roads are graded as needed. **BMP's**- preserve vegetation, gravel and rip-rap are used on steeper slopes and erosion prone areas.
 - Material management- materials are trucked in to the different storage or field work locations such as salt, road base and slag. **BMP's**- before the truck gets on the road after loading or dumping, the driver inspects the truck and brushes off any material that could spill on the road, long haul loads are covered while being transported. When material is dumped on the street for road, sidewalk or curb replacement projects, the area selected will be: flat, away from catch basins or water bodies; any catch basin that may be impacted will be protected and remaining materials will be removed as soon as possible.
 - Garbage collections- the city owns 4 garbage collection trucks, it is dumped at the SUVSWTS (South Utah Valley Solid Waste Transfer Station), and the trucks are rinsed at the Springville City Waste Water Treatment Plant drying beds and then washed at any of the local commercial car wash facilities.

V. Spill Prevention and Response Procedures

Hazardous Material	Location of Spill	Reportable Quantity
Gasoline, Diesel Fuel and Oils	Land/Water	25 gallons or visible sheen

Each work area has a spill response kit. Most of the spills can be cleaned up following the manufacturer recommendation. Absorbent/oil dry, sealable containers, plastic bags, and shovels/brooms are suggested minimum spill response items that should be on this location

- 1st Priority: Protect all people
- 2nd Priority: Protect equipment and property
- 3rd Priority: Protect the environment

1. Make sure the spill area is safe to enter and that it does not pose an immediate threat to health or safety of any person.
2. Stop the spill source
3. Check for hazards (flammable material, noxious fumes, cause of spill) – if flammable liquid, turn off engines and nearby electrical equipment. If serious hazards are present leave area and call 911. **LARGE SPILLS ARE LIKELY TO PRESENT A HAZARD.**
4. Call co-workers and supervisor for assistance and to make them aware of the spill and potential dangers
5. If possible, stop spill from entering drains (use absorbent or other material as necessary)
6. Stop spill from spreading (use absorbent or other material)
7. If spilled material has entered a storm sewer; contact the City Storm Water Department.
8. Clean up spilled material according to manufacturer specifications, for liquid spills use absorbent materials and do not flush area with water.
9. Properly dispose of cleaning materials and used absorbent material according to manufacturer specifications.

Emergency Numbers

Springville City Fire Department	801-491-5600
Springville City Police Department	801-489-9421
Springville City Storm Water Collections	801-489-2745

VI. Inspections

Qualified personnel from the Street Division or Storm Water Division will conduct inspections of the assigned areas and document with the appropriate report. Inspection reports and logs are located on the appendices section of this manual.

- Weekly visual inspections for:
 - City Operations Compound;
 - Rodeo Grounds;
 - Land Fill;

- Quarterly Comprehensive Inspections for:
 - City Operations Compound; and

Weekly visual inspections will be tracked in the log attached on appendix F spills will be cleaned up immediately and documented on a spill report located on appendix D.

Deficiencies will have to be corrected with in one week of being reported. All inspections and follow up actions will be documented and kept within this O&M Manual. Corrective Action Log Appendix E

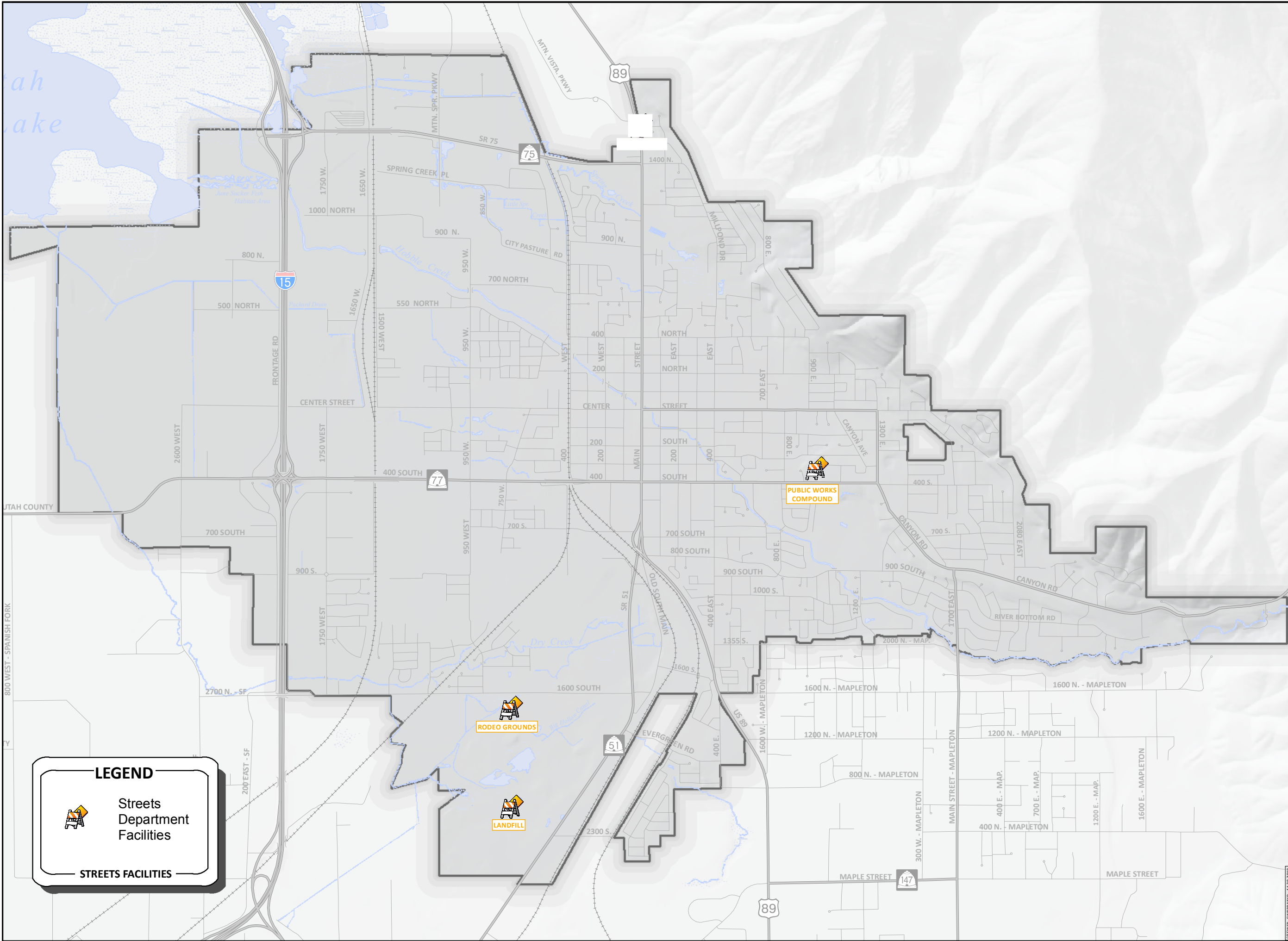
VII. Employee Training (permit requirement 4.2.1.5.)

All of the Street Division employees will receive training regarding this O&M Manual at least annually. The training will cover the following subjects:

- Impacts associated with illicit discharges;
- Proper storage of raw materials;
- Proper disposal and management of wastes;
- Proper management and use of salt and other de-icing materials;
- Proper maintenance of indoor and outdoor working areas including parking lot surfaces;
- Spill response; and
- Inspections training.

Appendix A

Site Maps



LEGEND

 Streets Department Facilities

STREETS FACILITIES

This document is neither a legally recorded map nor a survey and is not intended to be used as one. This document is a compilation of records, information and data provided by various City, County, and State resources and other sources, and is to be used for reference purposes only. Springville City makes no warranty, expressed or implied, as to the accuracy of this data and expressly disclaims liability for the accuracy of the data and document.

STREETS DEPARTMENT FACILITIES

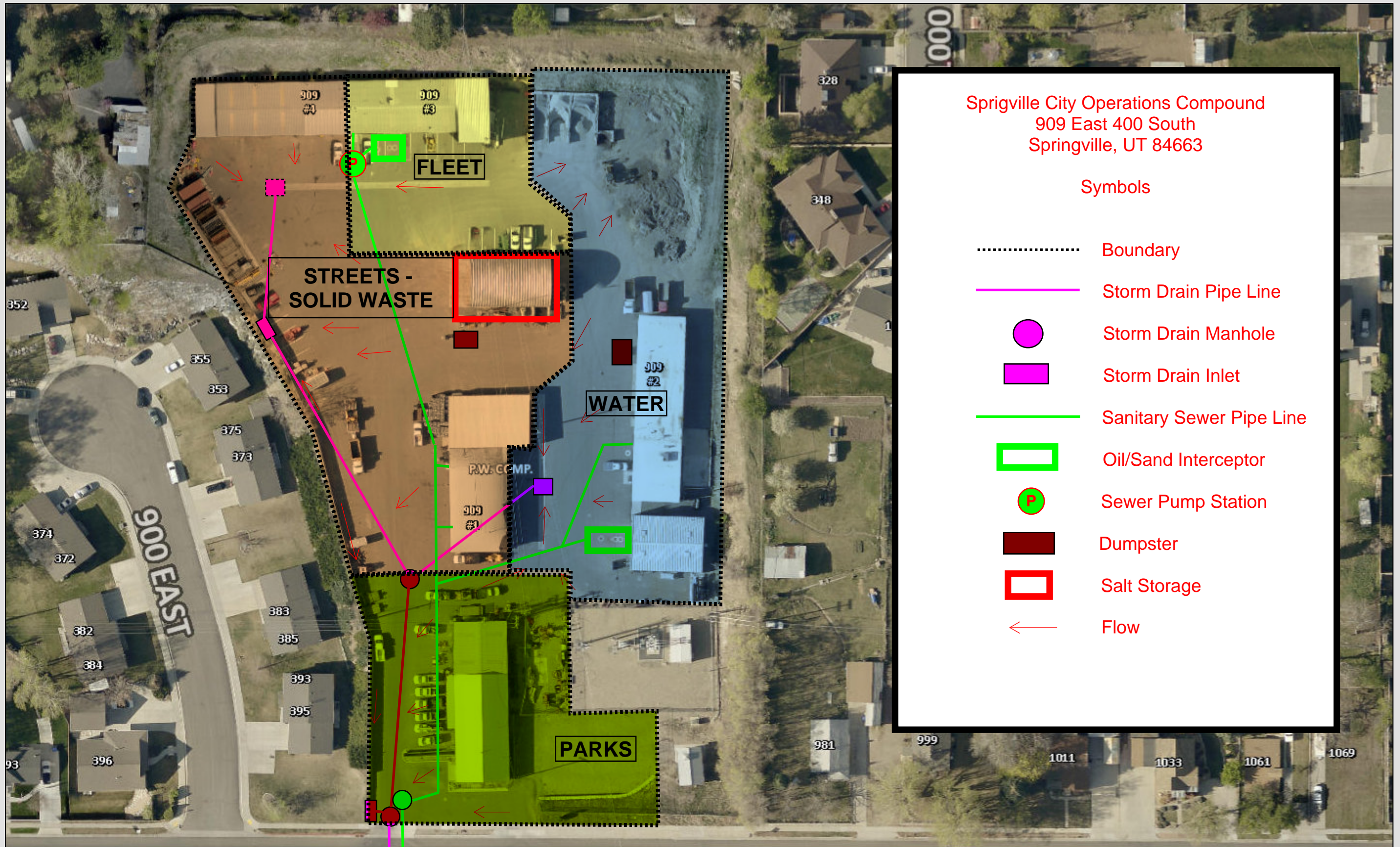
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SPRINGVILLE CITY
ENGINEERING DIVISION
GEOGRAPHIC INFORMATION SYSTEMS
110 S. MAIN ST. - SPRINGVILLE, UTAH



7/25/2016 11:39:20 AM

SPRINGVILLE CITY



Springville City Operations Compound
 909 East 400 South
 Springville, UT 84663

Symbols

- Boundary
- Storm Drain Pipe Line
- Storm Drain Manhole
- Storm Drain Inlet
- Sanitary Sewer Pipe Line
- ▭ Oil/Sand Interceptor
- Ⓟ Sewer Pump Station
- Dumpster
- ▭ Salt Storage
- ← Flow

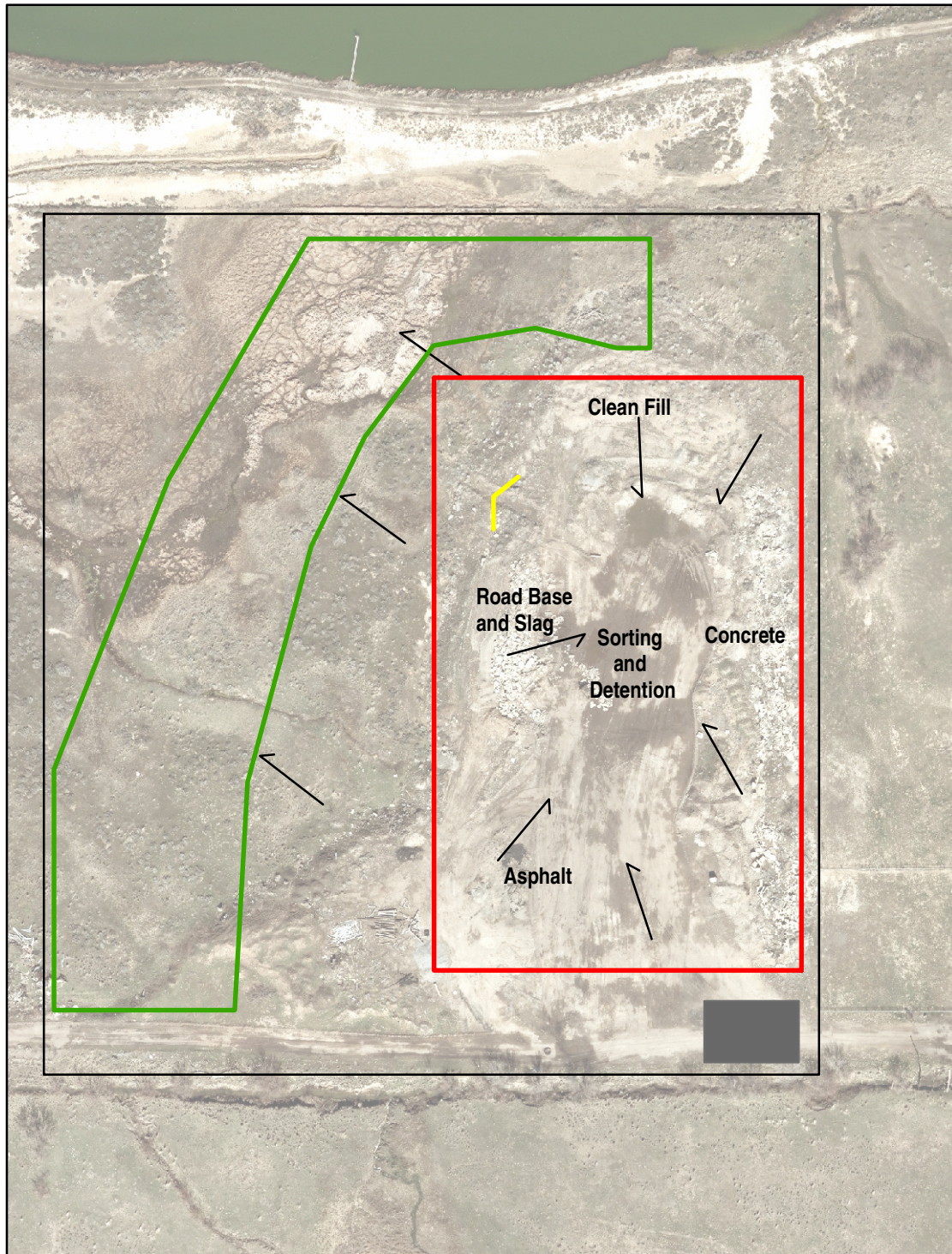
Date: 6/23/2016



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 ----- Springville City GIS - mphilp@springville.org -----

1:1,128

Springville City Fill Site
2200 South 700 West
Springville, UT 84663



Symbols

- Boundary Line
- ↙ Surface Flow
- Tracking Pad
- Vegetated Buffer
- Overflow Check Dam
- Storage Areas

Springville City Rodeo Grounds
1600 South 700 West
Springville, UT 84663



Symbols



Boundary Line



Surface Flow



Tracking Pad



Vegetated Buffer



Storage Areas

Appendix B

BMPs Specifications and Details



DESCRIPTION:

Area control procedures involve practicing good housekeeping measures such as maintaining indoor or covered material storage and industrial processing areas. If the area is kept clean, the risk of accumulating materials on footwear and clothing is reduced. In turn, the chance of left over pollutants making contact with stormwater polluting surface water is minimized.

APPROACH:

Area control procedures can be used at any facility where materials may be tracked into areas where they can come in contact with stormwater runoff. Areas can include material handling areas, storage areas, or process areas.

Effective practices include the following:

- Cover garments, foot mats, and other devices used to collect residual material near the area should be cleaned regularly.
- Brush off clothing before leaving the area.
- Stomp feet to remove material before leaving the area.
- Use floor mats at area exits.
- Use coveralls, smocks, and other overgarments in areas where exposure to material is of greatest concern (employees should remove the overgarments before leaving the area).
- Post signs to remind employees about these practices.

LIMITATIONS:

May be seen as tedious by employees and therefore may not be followed.

MAINTENANCE:

Materials storage areas and industrial processing areas should be checked regularly to ensure that good housekeeping measures are implemented.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

*Springville City Corporation
Public Works Department
Engineering Division
110 South Main Street
Springville, Utah 84663
801-491-2780*

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

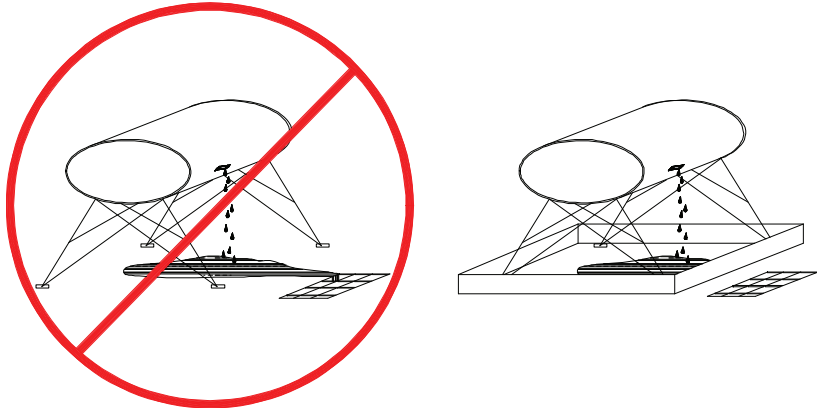
- Sediment
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

*Springville City Corporation
Public Works Department
Engineering Division
110 South Main Street
Springville, Utah 84663
801-491-2780*

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from aboveground storage tanks by installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

The most common causes of unintentional releases are:

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

APPROACH:

- Integrate efforts with existing aboveground petroleum storage tank programs through the local Fire Department and Health Department, and area and business emergency response plans through the City, County, or Fire District.
- Use engineering safeguards to reduce the chance for spills.
- Perform regular maintenance.

LIMITATIONS:

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

MAINTENANCE:

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

- Check for external corrosion and structural failure,
- Check for spills and overfills due to operator error,
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves),
- Check for leaks or spills during pumping of liquids or gases from truck to storage facility or vice versa.
- Periodically, integrity testing should be conducted by a qualified professional.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

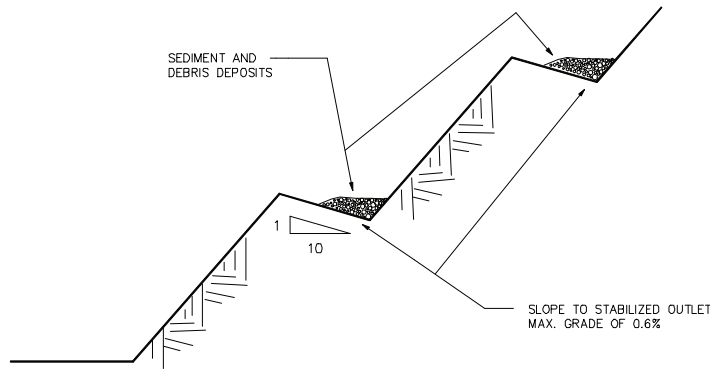
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High • Medium • Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Slope construction with benches spaced at regular intervals perpendicular to the slope which intercept and collect sheet flow and direct it to a stable outfall point.

APPLICATION:

- Unstabilized cut and fill slopes
- Large stockpiles
- Existing unstable slopes

INSTALLATION/APPLICATION CRITERIA:

- Benches should be formed as slope is constructed and graded to the outlet point.
- Stabilized outlet with sediment controls should be in place prior to slope construction.

LIMITATIONS:

- Construction slope design must accommodate benching
- Not appropriate for sandy or rocky soil
- Only effective if suitable outlet provided

MAINTENANCE:

- Inspect after major storm events and at least biannually, repair any damaged areas
- Remove debris blocking water flow
- Inspect outlet, repair/replace sediment controls and remove sediment build up.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



Springville

Springville City Corporation
Public Works Department
Engineering Division
110 South Main Street
Springville, Utah 84663
801-491-2780

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

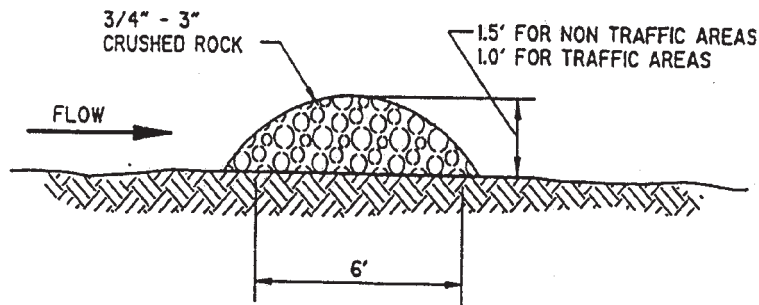
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADAPTED FROM SALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

A rock filter is made of rock 3/4 - 3" in diameter and placed along a level contour. A brush filter is composed of brush (usually obtained during the site clearing) wrapped in filter cloth and anchored to the toe of the slope. If properly anchored brush or rock filters may be used for sediment trapping and velocity reduction.

APPLICATION:

- As check dams across mildly sloped construction roads.
- Below the toe of slopes.
- Along the site perimeter.
- In areas where sheet or rill flow occurs.
- Around temporary spoil areas.
- At sediment traps or culvert/pipe outlets.

INSTALLATION/APPLICATION CRITERIA:

- For rock filter, use larger rock and place in a staked, woven wire sheathing if placed where concentrated flows occur.
- Install along a level contour.
- Leave area behind berm where runoff can pond and sediment can settle.
- Drainage areas should not exceed 5 acres.

LIMITATIONS:

- Rock berms may be difficult to remove.
- Removal problems limit their usefulness in landscaped areas.
- Runoff will pond upstream of the filter, possibly causing flooding if sufficient space does not exist.

MAINTENANCE:

- Inspect monthly after each rainfall.
- If berm is damaged, reshape and replace lost/dislodged rock.
- Remove sediment when depth reaches 1/3 of berm height, or 1 ft.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

■ **Sediment**

- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adapted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and maintaining the stormwater collection system.

Buildings and grounds maintenance includes taking care of landscaped areas around the facility, cleaning of parking lots and pavement other than in the area of industrial activity, and the cleaning of the storm drainage system.

APPROACH:

- Preserve existing native vegetation to reduce water, fertilizer, and pesticide needs.
- Carefully use pesticides and fertilizers in landscaping.
- Integrate pest management where appropriate.
- Sweep paved surfaces.
- Clean the storm drainage system at appropriated intervals.
- Properly dispose of wash water, sweepings, and sediments.

LIMITATIONS:

Alternative pest/weed controls may not be available, suitable or effective in every case.

MAINTENANCE:

The BMPs themselves relate to maintenance and do not require maintenance as they do not involve structures.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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TARGETED POLLUTANTS

- High Impact
- Low or Unknown Impact
- Medium Impact

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Prevent or reduce the discharge of pollutants to storm water from building repair, remodeling and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

APPLICATION:

- Use soil erosion control techniques if bare ground is temporarily exposed.
- Use permanent soil erosion control techniques if the remodeling clears buildings from an area that are not to be replaced.

INSTALLATION/APPLICATION CRITERIA:

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Properly store materials that are normally used in repair and remodeling such as paints and solvents.
- Properly store and dispose waste materials generated from the activity.
- Maintain good housekeeping practices while work is underway.

LIMITATIONS:

- This BMP is for minor construction only.
- Hazardous waste that cannot be re-used or recycled must be disposed of by a licensed hazardous waste hauler.
- Safer alternative products may not be available, suitable, or effective in every case.
- Be certain that actions to help storm water quality are consistent with OSHA and air quality regulations.

MAINTENANCE:

None.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

Sediment

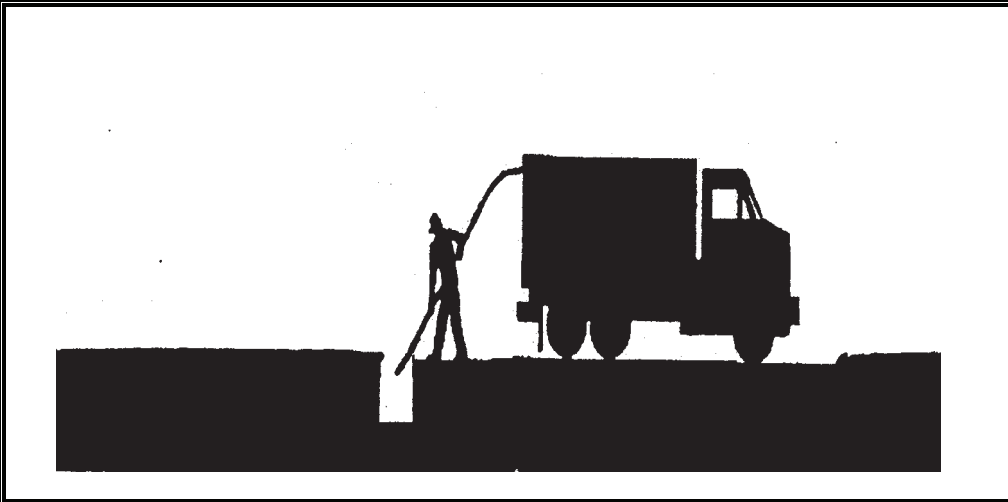
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adapted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Maintain catch basin and stormwater inlets on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, and restore the catch basins' sediment trapping capacity. A catch basin is distinguished from a stormwater inlet by having at its base a sediment sump designed to catch and retain sediments below the overflow point. This information sheet focuses on the cleaning of accumulated sediments from catch basins.

APPROACH:

Regular maintenance of catch basins and inlets is necessary to ensure their proper functioning. Clogged catch basins are not only useless but may act as a source of sediments and pollutants. In general, the key to effective catch basins are:

- At least annual inspections.
- Prioritize maintenance to clean catch basins and inlets in areas with the highest pollutant loading.
- Clean catch basins in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.

LIMITATIONS:

There are no major limitations to this best management practice.

MAINTENANCE:

Regular maintenance of public and private catch basins and inlets is necessary to ensure their proper functioning. Clogged catch basins are not only useless but may act as a source of sediments and pollutants. In general, the keys to effective catch basins are:

- Annual/monthly inspection of public and private facilities to ensure structural integrity, a clean sump, and a stenciling of catch basins and inlets.
- Keep logs of the number of catch basins cleaned.
- Record the amount of waste collected.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

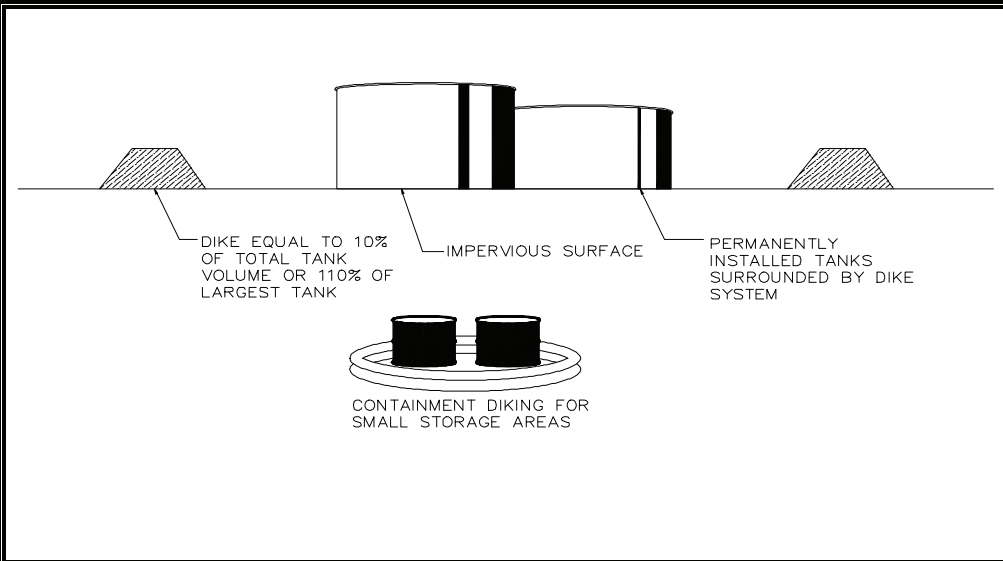
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

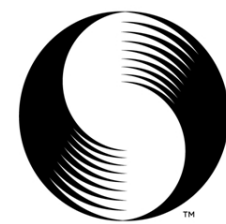
- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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DESCRIPTION:

Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking, one of the most common types of containment, is an effective method of pollution prevention for above-ground liquid storage tanks and rail car or tank truck loading and unloading areas. Diking can provide one of the best protective measures against the contamination of stormwater because it surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater outside of the diked area.

APPROACH:

- Containment dikes should be large enough to hold an amount equal to the largest single storage tank at the particular facility plus the volume of rainfall or 10% of total tank volume.
- Materials used to construct the dike should be strong enough to safely hold spilled materials. Materials used usually depend on what is available onsite and the substance to be contained. The material may consist of earth (i.e., soil or clay), concrete, synthetic materials (liners), metal, or other impervious materials.
- Containment dikes may need to be designed with impervious materials to prevent leaking or contamination of stormwater, surface, and ground water supplies.
- Uncontrolled overflows from diked areas containing spilled materials or contaminated stormwater should be prevented to protect nearby surface and ground waters. Therefore, dikes should have either pumping systems or vacuum trucks available to remove the spilled materials.

LIMITATIONS:

- May be too expensive for small facilities.
- Could collect contaminated stormwater, possibly resulting in infiltration of stormwater to ground water.

MAINTENANCE:

Inspections should be conducted during or after significant storms or spills to check for washouts or overflows. In addition, regular checks of containment dikes (i.e., testing to ensure that dikes are capable of holding spills) is recommended.

TARGETED POLLUTANTS

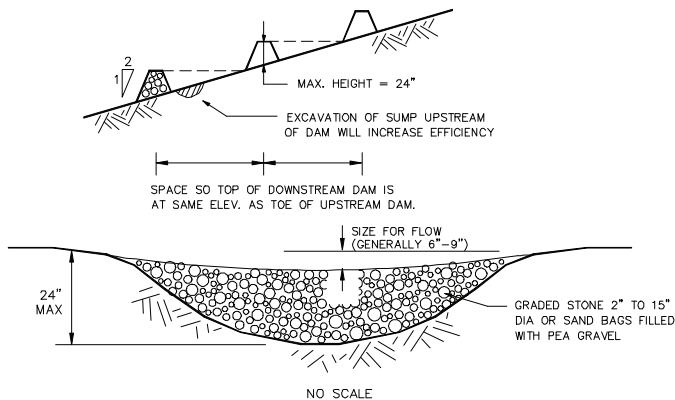
- High Impact
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- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High • Medium • Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

A small, temporary dam constructed across a drainage ditch to reduce velocity of concentrated storm water flows, thereby reducing the erosion of the ditch.

APPLICATION:

- Temporary drainage paths
- Permanent drainage ways not yet stabilized
- Existing drainage paths receiving increased flows due to construction

INSTALLATION/APPLICATION CRITERIA:

- Prepare location of dam by removing any debris and rough grading any irregularities in channel bottom
- Place rocks by hand or with appropriate machinery, do not dump
- Construct dam with center lower to pass design flow
- Construct 50% side slopes on dam

LIMITATIONS:

- Maximum recommended drainage area is 10 acres
- Maximum recommended height is 24"
- Do not use in running stream

MAINTENANCE:

- Inspect dams daily during prolonged rainfall, after each major rain event and at a minimum of once monthly.
- Remove any large debris and repair any damage to dam, channel or sideslopes
- Remove accumulated sediment when it reaches one half the height of the dam

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

Sediment

- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADAPTED FROM SALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

Prevent or reduce the discharge of pollutants to storm water from contaminated or erodible surface areas by leaving as much vegetation on-site as possible, minimizing soil exposure time, stabilizing exposed soils, and preventing storm water runoff and runoff.

APPLICATION:

This BMP addresses soils which are not so contaminated as to exceed criteria but the soil is eroding and carrying pollutants off in the storm water.

INSTALLATION/APPLICATION CRITERIA:

Contaminated or erodible surface areas can be controlled by: Preservation of natural vegetation, re-vegetation, chemical stabilization, removal of contaminated soils or geosynthetics.

LIMITATIONS:

- Disadvantages of preserving natural vegetation or re-vegetating include:
- Requires substantial planning to preserve and maintain the existing vegetation.
 - May not be cost-effective with high land costs.
 - Lack of rainfall and/or poor soils may limit the success of re-vegetated areas.
 - Disadvantages of chemical stabilization include:
 - Creation of impervious surfaces.
 - May cause harmful effects on water quality.
 - Is usually more expensive than vegetative cover.

MAINTENANCE:

Maintenance should be minimal, except possibly if irrigation of vegetation is necessary.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

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- Medium Impact
- Low or Unknown Impact

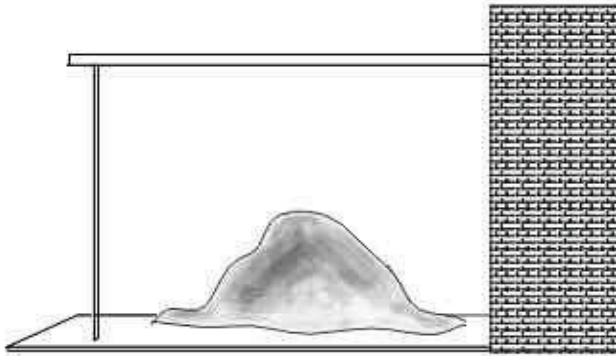
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adapted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Covering is the partial or total physical enclosure of materials, equipment, process operations, or activities. Covering certain areas or activities prevents stormwater from coming into contact with potential pollutants and reduces material loss from wind blowing. Tarpaulins, plastic sheeting, roofs, buildings, and other enclosures are examples of covering that are effective in preventing stormwater contamination. Covering can be temporary or permanent.

APPROACH:

- Covering is appropriate for outdoor material storage piles (e.g., stockpiles of dry materials, gravel, sand, compost, sawdust, wood chips, and de-icing salt) as well as areas where liquids and solids in containers are stored or transferred.
- While it may be too expensive to cover all industrial activities, cover all high-risk areas first (e.g., chemical preparation areas, vehicle maintenance areas, and areas where salts are stored), then according to budget cover the rest of the materials.
- Evaluate the strength and longevity of the covering, as well as its compatibility with the material or activity being enclosed.
- When designing an enclosure, consider access to materials, their handling, and transfer.
- Materials that pose environmental and safety dangers require special ventilation and temperature considerations.
- Covering alone may not protect the materials. When designing, consider placing materials on an elevated, impermeable surface or build curbing around the outside of the materials to prevent problems from runoff of uncontaminated stormwater from adjacent areas.
- Anchor all coverings with stakes, tie-down ropes, large rocks, tires or other easily available heavy objects.

LIMITATIONS:

- Requires frequent inspection.
- May pose health or safety problems if enclosure is built over certain activities.

MAINTENANCE:

- Frequently inspect coverings for rips, holes and general wear.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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TARGETED POLLUTANTS

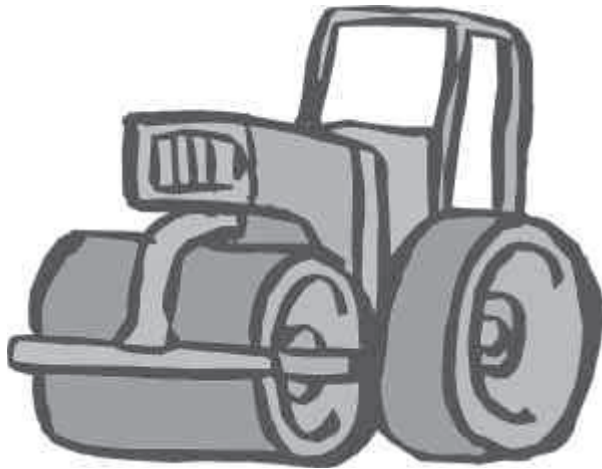
- High Impact
 - Medium Impact
 - Low or Unknown Impact
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Use of rolling, tamping, or vibration to stabilize fill materials and control erosion by increasing the soil density. Increasing the density of soil improves soil strength, reduces long-term soil settlement, and provides resistance to erosion.

APPLICATIONS:

- Stabilize fill material placed around various structures.
- Improve soil in place as foundation support for roads, parking lots, and buildings.

INSTALLATION/APPLICATION CRITERIA:

- Make sure soil moisture content is at optimum levels.
- Use proper compaction equipment.
- Install sediment control and storm water management devices below compacted areas and runoff interceptor devices above these areas. Drainage from compacted areas must be carefully planned to protect adjacent uncompacted soils.
- The surface of compacted areas should be scarified and seeded or mulched and seeded to increase the effectiveness of compaction.

LIMITATIONS:

- Compaction tends to increase runoff.
- Over-compaction will hamper revegetation efforts.

MAINTENANCE:

No maintenance required.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

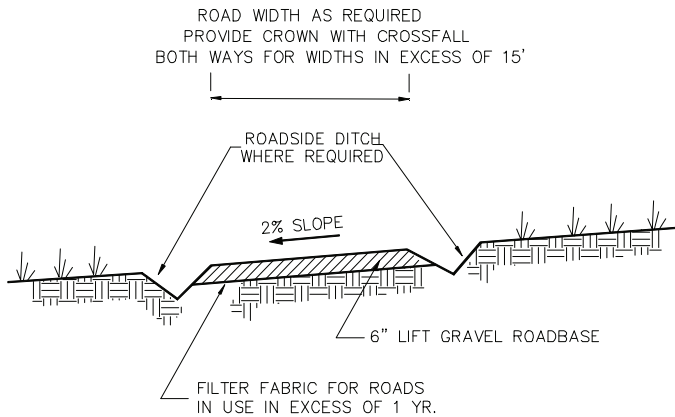
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adapted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Temporary stabilization of on-site roadway by placement of gravel roadbase.

APPLICATION:

- On-site roadways used daily by construction traffic (may not apply to gravelly type soils)
- Parking or staging areas susceptible to erosion due to traffic use

INSTALLATION/APPLICATION CRITERIA:

- Grade temporary access road with 2% cross fall, for two-way width provide crown.
- Provide roadside ditch and outlet controls where required.
- Place 6 inches of 2-inch to 4-inch crushed rock on driving area

LIMITATIONS:

- May require removal of gravel roadbase at completion of activities if final cover is not impervious
- May require controls for surface storm water runoff

MAINTENANCE:

- Inspect after major rainfall events and at least monthly.
- Place additional gravel as needed and repair any damaged areas.
- Maintain any roadside drainage controls.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact

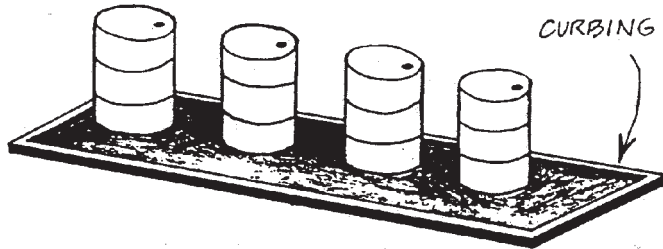
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Curbing is a barrier that surrounds an area of concern, much like containment diking (See Containment Diking BMP). Curbing prevents spills, leaks, etc. from being released to the environment by routing runoff to treatment or control areas. The terms curbing and diking are sometimes used interchangeably.

APPROACH:

- Curbing can be used at all industrial facilities. It is particularly useful in areas where liquid materials are transferred and as a stormwater runoff control.
- As with diking, common materials for curbing include earth, concrete, synthetic materials, metal, or other impenetrable materials. Asphalt is also a common material used in curbing.
- For maximum efficiency, spilled materials should be removed immediately, to allow space for future spills.
- Curbs should have pumping systems, instead of drainage systems, for collecting spilled materials.
- Curb systems should be maintained through curb repair (patching and replacement).
- To minimize the amount of spilled material tracked outside of the area by personnel, grade within the curbing to direct the spilled materials to a down-slope side of the curbing, thus keeping the spilled materials away from personnel and equipment. Grading will also facilitate clean-up.

LIMITATIONS:

- Curbing is not effective for holding large spills.
- May require more maintenance than diking.

MAINTENANCE:

- Inspection should be conducted before and after storm events.
- When certain spills occur, cleanup should start immediately, thus preventing overflows and contamination of stormwater runoff.
- Inspection should also be made to clear clogging debris, prevent dilution by rainwater, and to again prevent overflow of any materials.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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TARGETED POLLUTANTS

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- Low or Unknown Impact

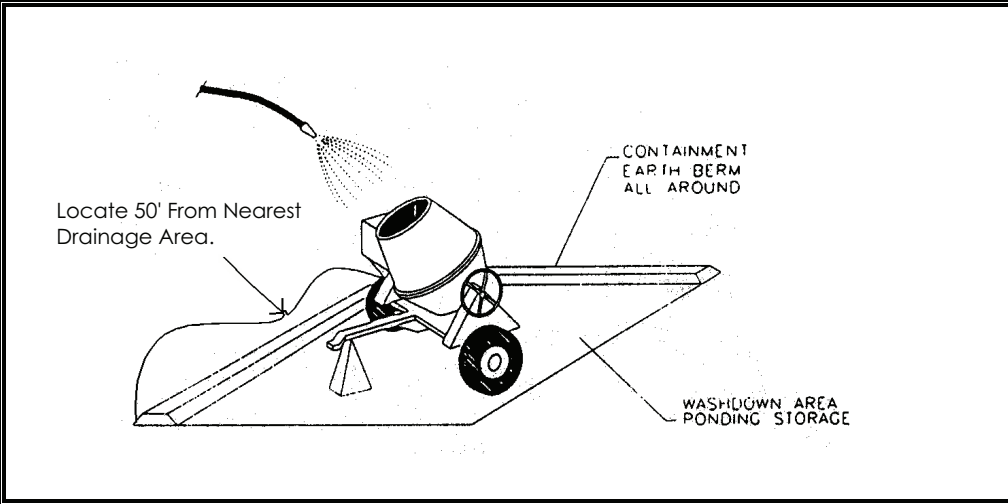
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPLICATIONS:

This technique is applicable to all types of sites.

INSTALLATION/APPLICATION CRITERIA:

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

LIMITATIONS:

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

MAINTENANCE:

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

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

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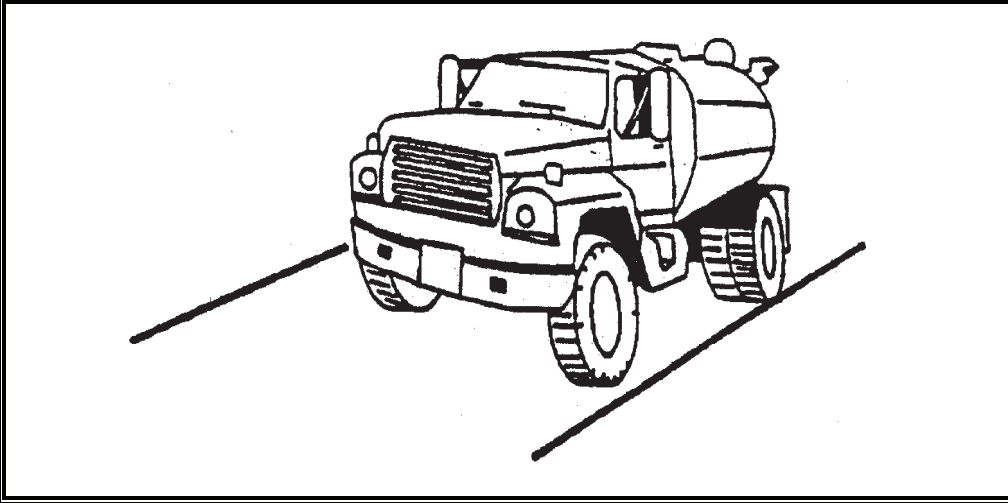
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High • Medium • Low

Materials Adopted from Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Dust control measures are used to stabilize soil from wind erosion, and reduce dust by construction activities.

APPLICATION:

Dust control is useful in any process area, loading and unloading area, material handling areas, and transfer areas where dust is generated. Street sweeping is limited to areas that are paved.

INSTALLATION/APPLICATION CRITERIA:

- Mechanical dust collection systems are designed according to the size of dust particles and the amount of air to be processed. Manufacturers' recommendations should be followed for installation (as well as the design of the equipment).
- Two kinds of street sweepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.
- Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.

LIMITATIONS:

- Is generally more expensive than manual systems.
- May be impossible to maintain by plant personnel (the more elaborate equipment).
- Is labor and equipment intensive and may not be effective for all pollutants (street sweepers).

MAINTENANCE:

If water sprayers are used, dust-contaminated waters should be collected and taken for treatment. Areas will probably need to be resprayed to keep dust from spreading.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
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- Control Internal Erosion



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- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

A sizeable amount of de-icing chemicals are used each winter on roads, parking lots, and sidewalks in Utah. Sodium chloride (salt) is the main chemical used. Proper use and storage of salt will reduce the chance of high chloride concentration in runoff that may damage the environment.

APPROACH:

- Proper storage practices can control sodium chloride pollution in runoff from stockpiles.
- For de-icing use, preventing over-application of salt will reduce quantities of chloride reaching surface or ground water.
- All salt piles should be covered with polyethylene if not stored in a shed. All sand/salt piles should be moved to empty salt sheds or covered during the spring and summer.
- Any runoff from stockpiles should be contained.
- To prevent over-application of salt one must properly calibrate the equipment and monitor the need for de-icing material.
- Another method to prevent the over-application of salt is to limit salt application on low traffic areas and straight level areas, critical areas will, however, need higher levels of service.

LIMITATIONS:

- All deicers hold the potential for damaging grass and plant biota should their concentration within the soil becomes unusually high. In amounts recommended for sidewalk and driveway deicing, there is minimal chance of damage to trees, grass, and shrubs. This is especially true if the chemical is used sparingly -- only to undercut snow and ice -- and the slush is not plowed or shoveled into grassy or planted areas.
- Another concern of many businesses and homeowners is the visible deicer residue that may be tracked into a building. This residue occurs because these deicers are solids in their natural state. However, since the residue is water soluble, it cleans up readily using plain water or ordinary household cleaner.
- Salt should not be used to melt every bit of snow and ice. Use only enough to break the ice/pavement bond, then remove the remaining slush by plowing or shoveling.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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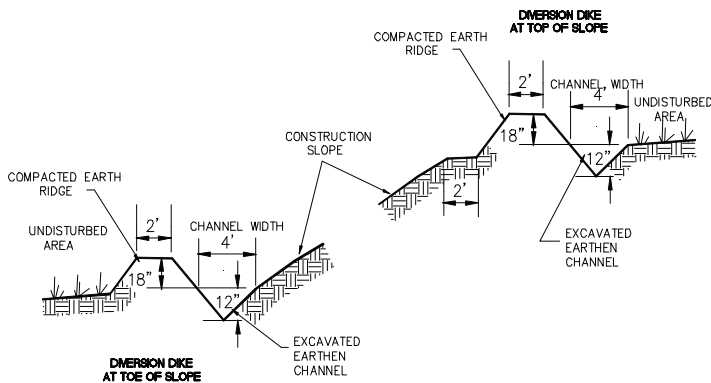
TARGETED POLLUTANTS

- High Impact
 - Medium Impact
 - Low or Unknown Impact
-
- Sediment
 - Nutrients
 - Heavy Metals
 - Toxic Materials
 - Oxygen Demanding Substances
 - Oil & Grease
 - Floatable Materials
 - Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
 - O&M Costs
 - Maintenance
 - Training
-
- High • Medium • Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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DESCRIPTION:

A temporary sediment barrier and storm runoff conveyance consisting of an excavation channel and compacted earth ridge.

APPLICATION:

- Construct along top of construction slope to intercept upgradient runoff and convey around construction site.
- Construct along toe of construction to divert sediment laden runoff.
- Construct along midpoint of construction slope to intercept runoff and channel to controlled discharge point.
- Construct around base of soil stockpiles to capture sediment.
- Construct around perimeter of disturbed areas to capture sediment.

INSTALLATION/APPLICATION CRITERIA:

- Clear and grub area for dike construction.
- Excavate channel and place soil on downgradient side.
- Shape and machine compact excavated soil to form ridge.
- Place erosion protection (riprap, mulch) at outlet.
- Stabilize channel and ridge as required with mulch, gravel, or vegetative cover.

LIMITATIONS:

- Recommended maximum drainage area of 5 acres
- Recommended maximum sideslopes of 2h:1v (50%)
- Recommended maximum slope on channel of 1%

MAINTENANCE:

- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff breaching dike or eroding channel or sideslopes.
- Check discharge point for erosion or bypassing of flows.
- Repair and stabilize as necessary.
- Inspect daily during vehicular activity on slope, check for and repair any traffic damage.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

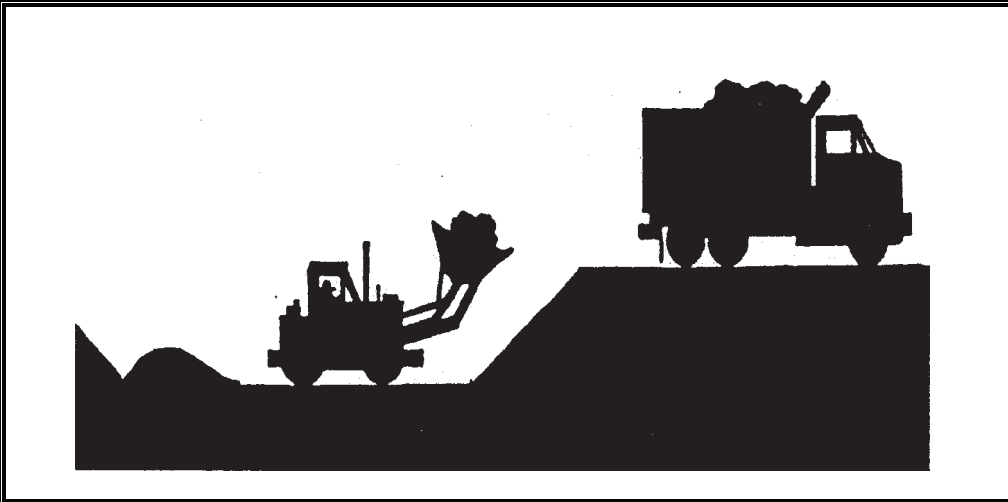
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADOPTED FROM SALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

Proper maintenance and siltation removal is required on both a routine and corrective basis to promote effective stormwater pollutant removal efficiencies for wet/dry detention pond and infiltrative devices.

APPROACH:

- Remove silt after sufficient accumulation.
- Periodically clean accumulated sediment and silt out of pre-treatment inlets.
- Infiltration device silt removal should occur when the infiltration rate drops below 1/2 inch per hour.
- Removal of accumulated paper, trash, and debris should occur every six months or as needed to prevent clogging of control devices.
- Vegetation growth should not be allowed to exceed 18 inches in height.
- Mow the slopes periodically and check for clogging, erosion and tree growth on the embankment.
- Corrective maintenance may require more frequent attention (as required).
- Create a public education campaign to explain the function of wet/dry detention pond/infiltration devices and their operation requirements for proper effectiveness.
- Encourage the public to report wet/dry detention pond/infiltration devices needing maintenance.

LIMITATIONS:

- Wet detention pond dredging can produce slurred waste that often exceeds the requirements of many landfills.
- Frequent sediment removal is labor and cost intensive.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

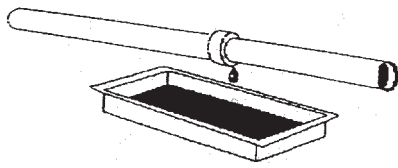
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

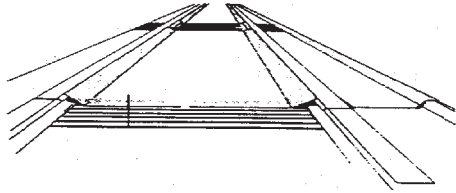
- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



Use Drip Pans for Leaking Equipment



Use Drip Pans in Loading and Unloading Areas

DESCRIPTION:

Drip pans are small depressions or pans used to contain very small volumes of leaks, drips, and spills that occur at a facility. Drip pans can be depressions in concrete, asphalt, or other impenetrable material. They can be made of metal, plastic, or any material that does not react with the dripped chemicals. Drip pans can be temporary or permanent.

Drip pans are used to catch drips from valves, pipes, etc. so that the materials or chemicals can be cleaned up easily or recycled before they contaminate stormwater. Although leaks and drips should be repaired and eliminated as part of a preventative maintenance program, drip pans can provide a temporary solution where repair or replacement must be delayed. In addition, drip pans can be an added safeguard when they are positioned beneath areas where leaks and drips may occur.

APPROACH:

- When using drip pans, consider the location of the drip pan, weather conditions, the type of material used for the drip pan, and how it will be cleaned.
- The location of the drip pan is important. Because drip pans must be inspected and cleaned frequently, they must be easy to reach and remove. However, take special care to avoid placing drip pans where they can be easily overturned or be a safety hazard.
- Secure pans by installing or anchoring them. Drip pans may be placed on platforms, behind wind blocks or tied down.
- Employees must pay attention to the pans and empty them when they are nearly full.
- Frequent inspection of the drip pans is necessary due to the possibility of leaks in the pan itself or in piping or valves that may occur randomly or irregular slow drips that may increase in volume.

LIMITATIONS:

- Contain small volumes only.
- Must be inspected and cleaned frequently.
- Must be secured during poor weather conditions.
- Contents may be disposed of improperly unless facility personnel are trained in proper disposal methods.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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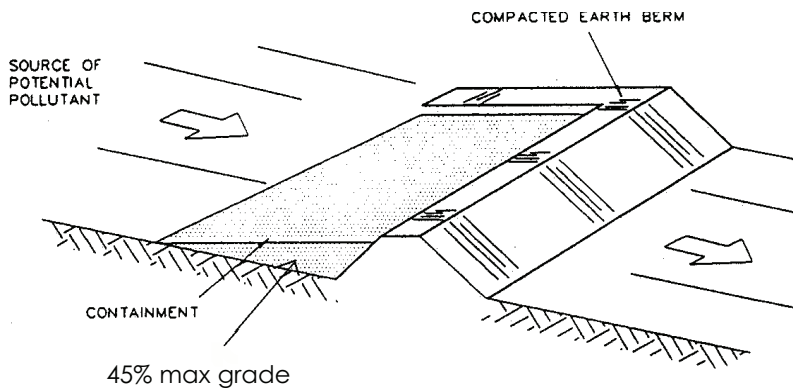
TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
 - O&M Costs
 - Maintenance
 - Training
- High • Medium • Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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DESCRIPTION:

A temporary containment control constructed of compacted soil.

APPLICATION:

- Construct around waste and materials storage area.
- Construct around staging and maintenance areas.
- Construct around vehicle parking and servicing areas.

INSTALLATION/APPLICATION CRITERIA:

- Construct an earthen berm down hill of the area to be controlled. The berm should surround fueling facilities and maintenance areas on three sides to provide containment.
- Berm needs to be a minimum of 1 foot tall by 1 foot wide and be compacted by earth moving equipment.

LIMITATIONS:

- Not effective on steep slopes.
- Limits access to controlled area.
- Personnel need to quickly respond to spills with remedial actions.

MAINTENANCE:

- Observe daily for any non-stormwater discharge.
- Look for runoff bypassing ends of berms or undercutting berms.
- Repair or replace damaged areas of the berm and remove accumulated sediment.
- Recompact soil around berm as necessary to prevent piping.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

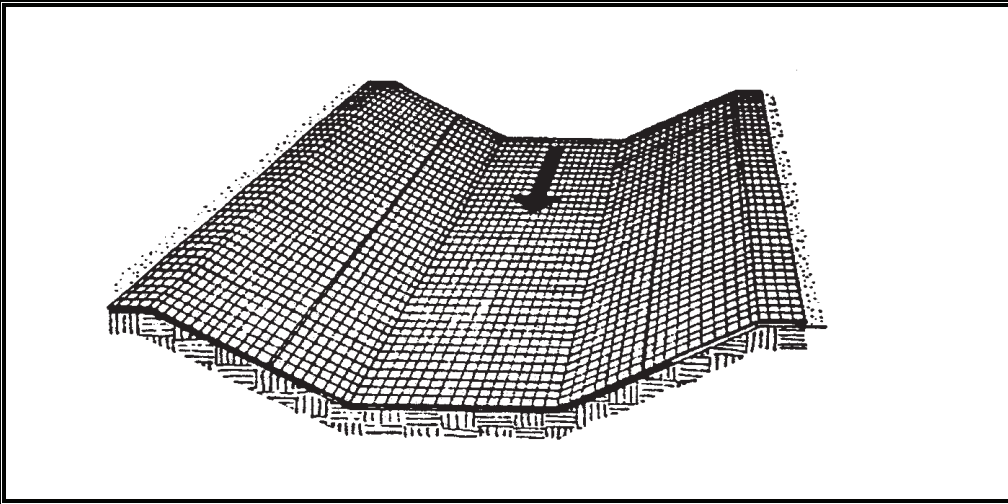
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADOPTED FROM SSALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

Erosion control blankets are used in place of mulch on areas of high velocity runoff and/or steep grade, to aid in controlling erosion on critical areas by protecting young vegetation.

APPLICATIONS:

- Where vegetation is likely to grow too slowly to provide adequate cover.
- In areas subject to high winds where mulch would not be effective.

INSTALLATION/APPLICATION CRITERIA:

- Install erosion control blankets parallel to the direction of the slope.
- In ditches, apply in direction of the flow.
- Place erosion control blankets loosely on soil - do not stretch.
- Ends of blankets should be buried no less than six inches deep.
- Staple the edges of the blanket at least every three feet.

LIMITATIONS:

- Not recommended in areas which are still under construction.

MAINTENANCE:

- Check for erosion and undermining periodically, particularly after rainstorms.
- Repair dislocations or failures immediately.
- If washouts occur, reinstall after repairing slope damage.
- Monitor until permanently stabilized.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

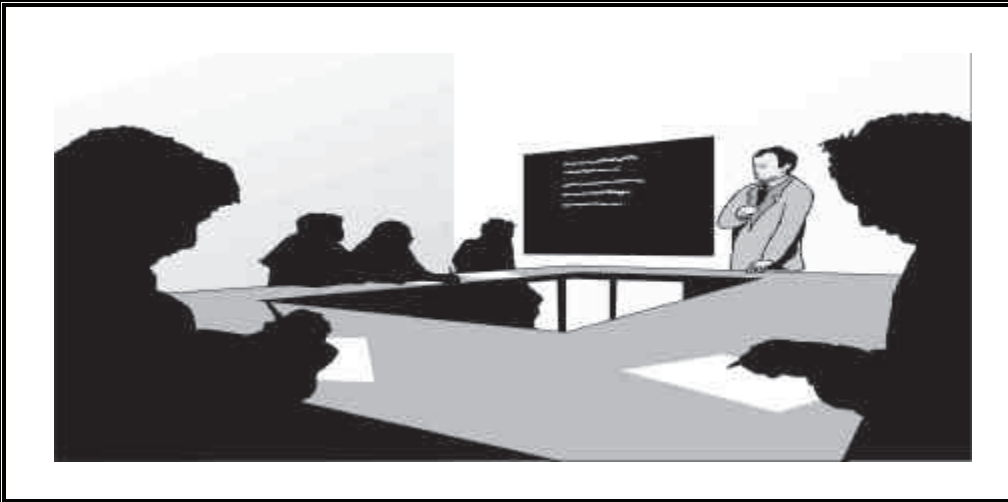
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Guidance Document



DESCRIPTION:

Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in stormwater pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

OBJECTIVES:

Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute stormwater;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

APPROACH:

- Integrate training regarding stormwater quality management with existing training programs that may be required for other regulations.
- Employee training is a vital component of many of the individual source control BMPs included in this manual.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals.

APPROACH:

- Pattern a new program after the many established programs from municipalities around the country. Integrate this best management practice as much as possible with existing programs at your municipality.
- This BMP has two key audiences: municipal employees and the general public.
- For the general public, municipalities should establish a public education program that provides information on such items as storm water pollution and beneficial effects of proper disposal on water quality; reading product labels; safer alternative products; safe storage, handling, and disposal of hazardous products; list of local agencies; and emergency phone numbers. The programs listed below have provided this information through brochures or booklets that are available at a variety of locations including municipal offices, household hazardous waste collection events or facilities, and public information fairs.

Municipal facilities should develop controls on the application of pesticides, herbicides, and fertilizers in public right-of-ways and at municipal facilities.

Controls may include:

- List of approved pesticides and selected uses.
- Product and application information for users.
- Equipment use and maintenance procedures.
- Record keeping and public notice procedures.

LIMITATIONS:

There are no major limitations to this best management practice.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

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

APPLICATION:

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

- Paints and Solvents; petroleum products such as oils, fuels, and grease; herbicides and pesticides; Acids for cleaning masonry; and concrete curing compounds.

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

- Sandblasting grit mixed with lead, cadmium, or chromium-based paints; Asbestos; and PCB's.

INSTALLATION/APPLICATION CRITERIA:

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

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

LIMITATIONS:

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

MAINTENANCE:

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

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

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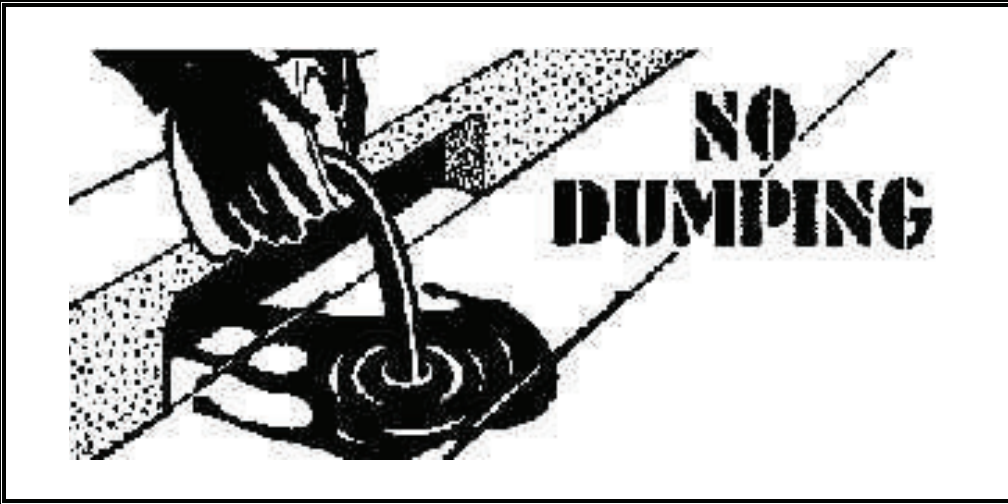
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Implement measures to detect, correct, and enforce against illegal dumping of pollutants on streets, into the storm drain system, and into creeks. Substances illegally dumped on streets, into the storm drain system, and into creeks includes paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes can cause storm water and receiving water quality problems as well as clog the storm drain system.

APPROACH:

One of the keys to success is increasing the general public's awareness of the problem and to at least identify the incident, if not correct it. There are a number of ways of accomplishing this:

- Train municipal staff from all departments to recognize and report incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act.
- Educate the public.
- Provide the public with a mechanism for reporting such as a hot line.

Establish system for tracking incidents which will identify:

- Illegal dumping "hot spots",
- Types and quantities (in some cases) of wastes,
- Patterns in time of occurrence (time of day/night, month, or year),
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accident/spills), and
- Responsible parties.

A tracking system also helps manage the program by indicating trends, and identifying who, what, when, and where efforts should be concentrated.

LIMITATIONS

The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

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- Medium Impact
- Low or Unknown Impact

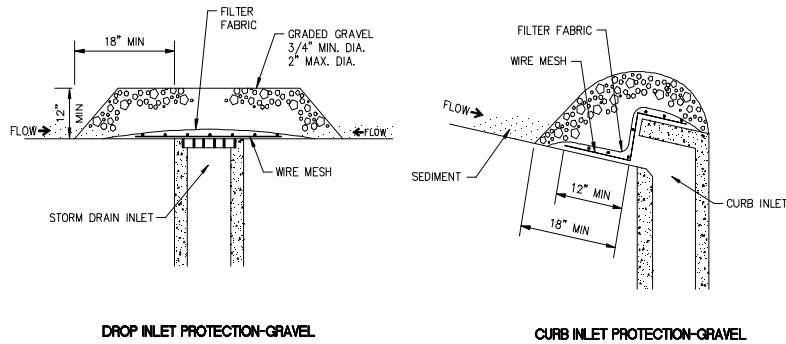
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Placement of gravel filter over inlet to storm drain to filter storm water runoff.

APPLICATION:

Construct at inlets in paved or unpaved areas where upgradient area is to be disturbed by construction activities.

INSTALLATION/APPLICATION CRITERIA:

- Place wire mesh (with ½ inch openings) over the inlet grate extending one foot past the grate in all directions.
- Place filter fabric over the mesh. Filter fabric should be selected based on soil type.
- Place graded gravel, to a minimum depth of 12-inches, over the filter fabric and extending 18-inches past the grate in all directions.

LIMITATIONS:

- Recommended for maximum drainage area of one acre.
- Excess flows may bypass the inlet requiring down gradient controls.
- Ponding will occur at inlet.

MAINTENANCE:

- Inspect inlet protection after every large storm event and at a minimum of once monthly.
- Remove sediment accumulated when it reaches 4-inches in depth.
- Replace filter fabric and clean or replace gravel if clogging is apparent.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Litter control involves the removal of litter from streets and other surfaces before runoff or wind moves these materials to surface waters. This practice will prevent litter from becoming pollution as well as improving the aesthetics of the area.

APPROACH:

There are two categories of litter control programs: source reduction and removal programs.

Source reduction:

- Litter containers should be conveniently placed and emptied frequently to prevent overflow.
- Recycling programs should be promoted.
- Public education programs should be developed since litter control programs depend upon public support.

Litter removal programs:

- Litter control program include refuse and leaf collection, street cleaning, and catch basin cleaning.
- Educational programs that explain the environmental benefit of leaf collection to water quality are helpful.
- Municipal leaf collection is usually accomplished with street sweepers (see Street Cleaning BMP) or mechanical lawn sweepers.

LIMITATIONS:

No limitations.

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
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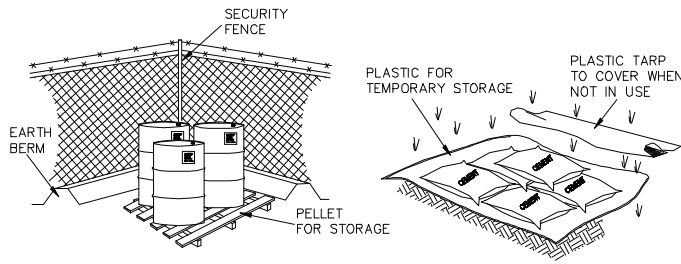
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



- ▶ CONTROLLED STORAGE LOCATION
- ▶ BERMED PERIMETER IMPOUNDMENT
- ▶ STORAGE OFF GROUND
- ▶ COVER WHEN NOT IN USE

DESCRIPTION:

Controlled storage of on-site materials.

APPLICATION:

- Storage of hazardous, toxic, and all chemical substances.
- Any construction site with outside storage of materials.

INSTALLATION/APPLICATION CRITERIA:

- Designate a secured area with limited access as the storage location. Ensure no waterways or drainage paths are nearby.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around storage location for impoundment in the case of spills.
- Ensure all on-site personnel utilize designated storage area. Do not store excessive amounts of material that will not be utilized on site.
- For active use of materials away from the storage area ensure materials are not set directly on the ground and are covered when not in use. Protect storm drainage during use.

LIMITATIONS:

- Does not prevent contamination due to mishandling of products.
- Spill Prevention and Response Plan still required.
- Only effective if materials are actively stored in controlled location.

MAINTENANCE:

- Inspect daily and repair any damage to perimeter impoundment or security fencing.
- Check materials are being correctly stored (i.e. standing upright, in labeled containers, tightly capped) and that no materials are being stored away from the designated location.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Applying materials such as vinyl, asphalt, plastics, or rubber on an unprotected slope to temporarily stabilize the slope.

APPLICATIONS:

- As a tacking agent to aid the stabilization of mulches (where matting is not used).
- As a short-term alternative in areas where temporary seeding practices cannot be used because of seasonal condition or climate.
- On steep and rocky slopes where neither mechanical methods or mulches and protective netting can be effectively applied.

INSTALLATION/APPLICATION CRITERIA:

- The application rates and procedures recommended by the manufacturer of a chemical stabilization product should be followed to prevent the products from forming ponds and from creating large areas where moisture cannot get through.
- For permanent application, chemical mulches (when used with seed and mulch) should be applied over wood fiber or straw mulch.

LIMITATIONS:

- Chemical mulches can create impervious surfaces and impact water quality if not properly applied.
- Some products may not be suitable for use near live streams.

MAINTENANCE:

- Inspect at regular intervals and after each runoff-producing storm event.
- Replace chemical mulch as needed to ensure adequate level of coverage.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
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- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High • Medium • Low

Materials Adapted From Salt Lake Country Engineering Division Guidance Document

**NO
DUMPING**



**WE ALL LIVE
DOWNSTREAM**

DESCRIPTION:

Eliminate non-stormwater discharges to the stormwater collection system. Non-stormwater discharges may include: process wastewaters, cooling waters, wash waters, and sanitary wastewater.

APPROACH:

The following approaches may be used to identify non-stormwater discharges:

- Visual inspection: the easiest method is to inspect each discharge point during dry weather. Keep in mind that drainage from a storm event can continue for three days or more and groundwater may infiltrate the underground stormwater collection system.
- Piping Schematic Review: The piping schematic is a map of pipes and drainage systems used to carry wastewater, cooling water, sanitary wastes, etc... A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system. Inspect the path of floor drains in older buildings.
- Smoke Testing: Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems. During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.
- Dye Testing: A dye test can be performed by simply releasing a dye into either the sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

LIMITATIONS:

- Many facilities do not have accurate, up-to-date schematic drawings.
- Video and visual inspections can identify illicit connections to the storm sewer, but further testing is sometimes required (e.g. dye, smoke) to identify sources.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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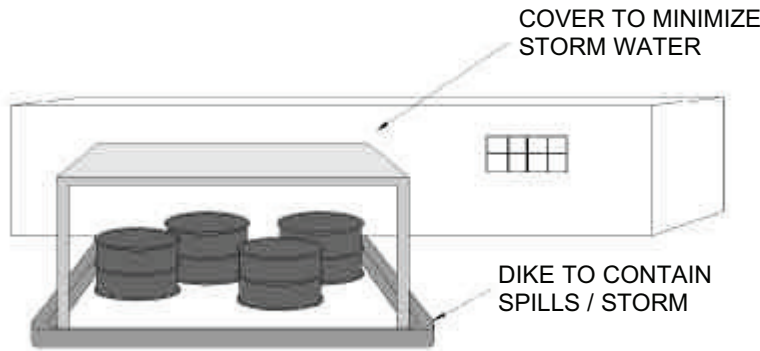
TARGETED POLLUTANTS

- High Impact
 - Medium Impact
 - Low or Unknown Impact
-
- Sediment
 - Nutrients
 - Heavy Metals
 - Toxic Materials
 - Oxygen Demanding Substances
 - Oil & Grease
 - Floatable Materials
 - Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
 - O&M Costs
 - Maintenance
 - Training
-
- High
 - Medium
 - Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

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Public Works Department
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DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from outdoor container storage areas by installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

APPROACH:

Protect materials from rainfall, runoff, and wind dispersal:

- Store materials indoors.
- Cover the storage area with roof.
- Minimize stormwater runoff by enclosing the area or building a berm around it.
- Use a "doghouse" for storage of liquid containers.
- Use covered dumpsters for waste product containers.

Storage of oil and hazardous materials must meet specific federal and state standards including:

- secondary containment,
- integrity and leak detection monitoring, and
- emergency preparedness plans.

Train operator on proper storage.

Safeguards against accidental releases:

- Overflow protection devices to warn operator or automatic shut down transfer pumps, protection guards (bollards) around tanks and piping to prevent vehicle or forklift damage, clear tagging or labeling, and restricting access to valves to reduce human error.

Berm or surround tank or container with secondary containment system:

- Dikes, liners, vaults, or double walled tanks.

Some municipalities require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

LIMITATIONS:

Storage sheds often must meet building and fire code requirements.

MAINTENANCE:

Conduct routine weekly inspections.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

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DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

APPROACH:

- Park tank trucks or delivery vehicles so that spills or leaks can be contained.
- Cover the loading/unloading docks to reduce exposure of materials to rain.
- A seal or door skirt between trailer and building can also prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runoff: grade/berm and position roof downspouts to direct stormwater away from loading/unloading areas.
- Contain leaks during transfer.
- Use drip pans under hoses.
- Make sure fork lift operators are properly trained.
- Train employees for spill containment and cleanup.

LIMITATIONS:

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
- It may not be possible to conduct transfers only during dry weather.

MAINTENANCE:

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks: valves, pumps, flanges, and connections.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

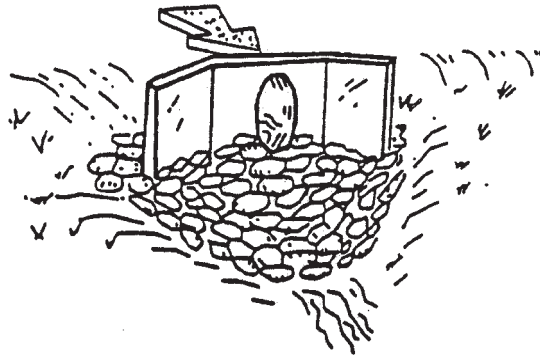
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

A rock outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble which is placed at the outlet of a pipe to prevent scour of the soil caused by high pipe flow velocities, and to absorb flow energy to produce non-erosive velocities.

APPLICATIONS:

- Wherever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach.
- Rock outlet protection is best suited for temporary use during construction because it is usually less expensive and easier to install than concrete aprons or energy dissipators.
- A sediment trap below the pipe outlet is recommended if runoff is sediment laden.
- Permanent rock riprap protection should be designed and sized by the engineer as part of the culvert, conduit or channel design.
- Grouted riprap should be avoided in areas of freeze and thaw because the grout will break up.

INSTALLATION/APPLICATION CRITERIA:

Rock outlet protection is effective when the rock is sized and placed properly. When this is accomplished, rock outlets do much to limit erosion at pipe outlets. Rock size should be increased for high velocity flows. Best results are obtained when sound, durable, angular rock is used.

LIMITATIONS:

- Large storms often wash away the rock outlet protection and leave the area susceptible to erosion.
- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.

MAINTENANCE:

- Inspect after each significant rain for erosion and/or disruption of the rock, and repair immediately.
- Grouted or wire-tied rock riprap can minimize maintenance requirements.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

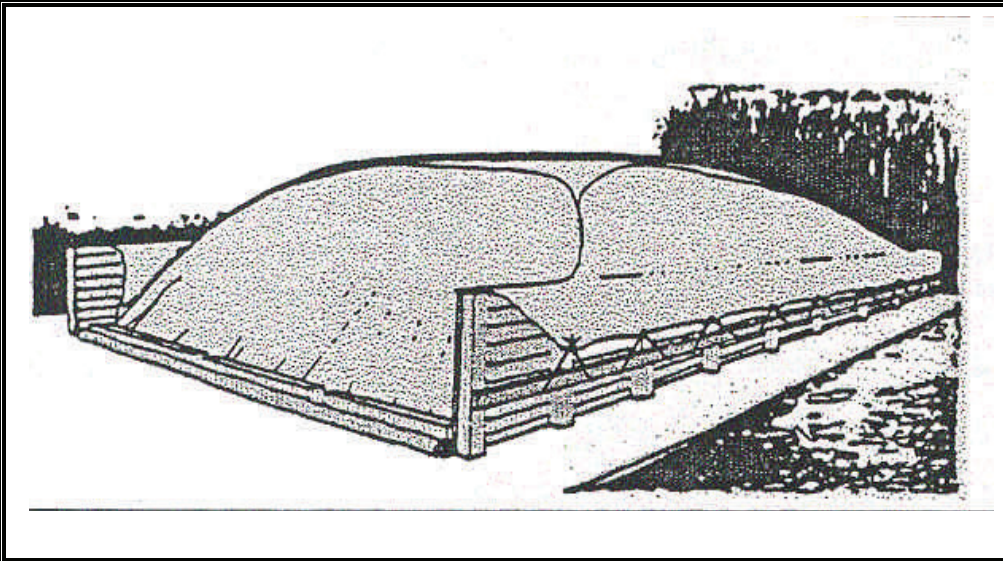
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADOPTED FROM SALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from outdoor materials and product storage areas by enclosing or covering materials, installing secondary containment, and preventing stormwater runoff.

APPROACH:

Protect materials from rainfall, runoff, runoff and wind dispersal:

- Store material indoors.
 - Cover the storage area with a roof.
 - Cover the material with a temporary covering made of polyethylene, polypropylene, or hypalon.
 - Minimize stormwater runoff by enclosing the area or building a berm around the area.
 - Use a "doghouse" for storage of liquid containers.
- Parking lots or other surfaces near bulk materials should be swept periodically to remove debris blown or washed from storage area.
 - Install pellet traps at stormwater discharge points where plastic pellets are loaded and unloaded.
 - Keep liquids in a designated area on a paved impervious surface within a secondary containment.
 - Keep outdoor storage containers in good condition.
 - Use berms and curbing.
 - Use catch basin filtration inserts.

LIMITATIONS:

- Space limitations may preclude storing some materials indoors.
- Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.
- Storage sheds often must meet building and fire code requirements.

MAINTENANCE:

Berm and curbing repair and patching.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

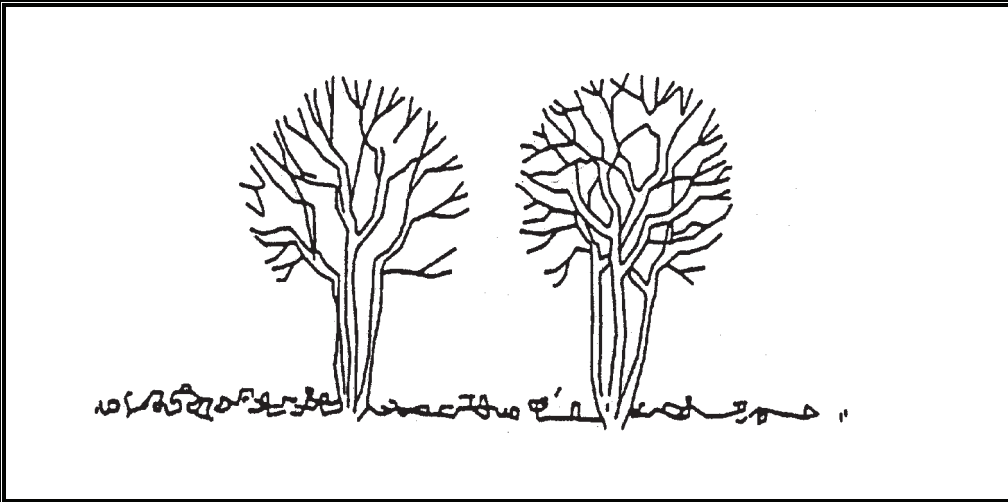
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



GENERAL DESCRIPTION:

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

APPLICATIONS:

This technique is applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

INSTALLATION/APPLICATION CRITERIA:

- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care during and after construction.
- Define and protect with berms, fencing, signs, etc. a setback area from vegetation to be preserved.
- Propose landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc. where significant adverse impact on existing vegetation may occur.

LIMITATIONS:

- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.
- May not be cost effective with high land costs.

MAINTENANCE:

- Inspection and maintenance requirements for protection of vegetation are low.
- Maintenance of native trees or vegetation should conform to landscape plan specifications.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



Program Elements

- Commercial Activities
- Municipal Activities
- Municipal Facilities
- Roadways
- House Keeping Practices
- Material Handling
- Equipment Maintenance

Description:

The application and storage of deicing materials, most commonly salts such as sodium chloride, can lead to water quality problems for surrounding areas. Salts, gravel, sand, and other materials are applied to highways and roads to reduce the amount of ice during winter storm events. Salts lower the melting point of ice, allowing roadways to stay free of ice buildup during cold winters. Sand and gravel increase traction on the road, making travel safer.

Application:

This practice occurs in areas that receive snowfall in winter months and require deicing materials. Municipalities in these areas must ensure proper storage and application for equipment and materials.

Siting and Design Considerations:

Many of the problems associated with contamination of local waterways stem from the improper storage of deicing materials. Salts are very soluble when they come into contact with stormwater. They can migrate into ground water used for public water supplies and also contaminate surface waters.

Maintenance Considerations:

Covering stored road salts may be costly; however, the benefits are greater than the perceived costs. Properly storing road salts prevents the salt from lumping together, which makes it easier to load and apply. In addition, covering salt storage piles reduces salt loss from stormwater runoff and potential contamination to streams, aquifers, and estuarine areas. Salt storage piles should be located outside the 100-year floodplain for further protection against surface water contamination.

If used during road salt application, certain best management practices can produce significant environmental benefits. The amount of road salt applied should be regulated to prevent over salting of roadways and increasing runoff concentrations.



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Targeted Pollutants

High Impact
Sediment
If used as recommended, will not
harm vegetation
Toxic Materials

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training



PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



Springville

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DESCRIPTION:

Reduce the discharges of pollutants to stormwater from street surfaces by conducting street cleaning on a regular basis.

APPROACH:

- Prioritize cleaning to use the most sophisticated sweepers, at the highest frequency, and in areas with the highest pollutant loading.
- Restrict street parking prior to and during sweeping.
- Increase sweeping frequency just before the rainy season.
- Proper maintenance and operation of sweepers greatly increase their efficiency.
- Keep accurate operation logs to track programs.
- Reduce the number of parked vehicles using regulations.
- Sweepers effective at removing smaller particles (less than 10 microns) may generate dust that would lead to concerns over worker and public safety.
- Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). Many communities find it useful to have a compliment of both types in their fleet.

LIMITATIONS:

- Conventional sweepers are not able to remove oil and grease.
- Mechanical sweepers are not effective at removing finer sediments.
- Effectiveness may also be limited by street conditions, traffic congestion, presence of construction projects, climatic conditions and condition of curbs.

MAINTENANCE:

- Replace worn parts as necessary.
- Install main and gutter brooms of the appropriate weight.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

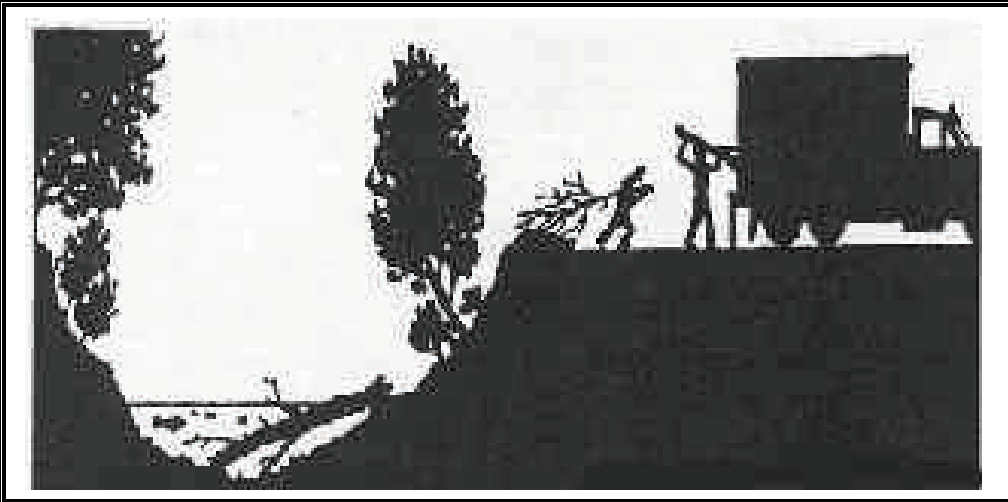
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Reduce pollutant levels in stormwater by removing illegally dumped items and material from storm drainage channels and creeks. Modify channel characteristics to enhance pollutant removal and/or hydraulic capacity.

APPROACH:

- Identify illegal dumping hot spots; regular inspection and clean up of hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Post "No Littering" signs with a phone number for reporting a dumping in-progress.
- Adopt and enforce substantial penalties for illegal dumping and disposal.
- Modify storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetics and habitat value.
- Maintain accurate logs to evaluate materials removed and improvements made.

LIMITATIONS:

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

PROGRAM ELEMENTS

- New Development
- Residential
- Commercial Activities
- Industrial Activities
- Municipal Facilities
- Illegal Discharges



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

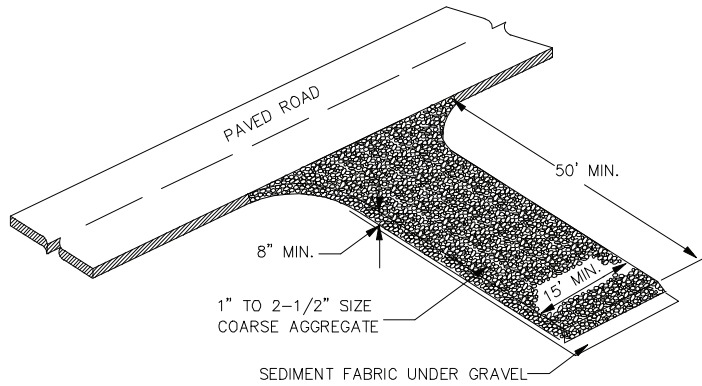
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Regulatory
- Training
- Staffing
- Administrative

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



Springville

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DESCRIPTION:

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface.

APPLICATIONS:

At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

INSTALLATION/APPLICATION CRITERIA:

- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months).
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.

LIMITATIONS:

- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.

MAINTENANCE:

- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

TARGETED POLLUTANTS

- High Impact
- Medium Impact

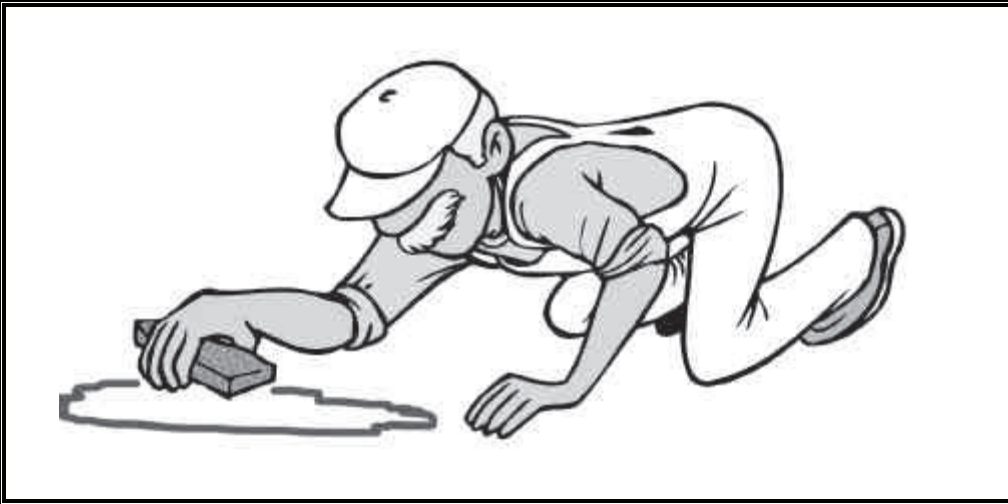
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

MATERIALS ADOPTED FROM SSALT LAKE COUNTY ENGINEERING DIVISION GUIDANCE DOCUMENT



DESCRIPTION:

Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

APPLICATION:

All sites

GENERAL:

- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

METHODS:

- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact local Fire Department and State Division of Environmental Response and Remediation (Phone #536-4100) for any spill of reportable quantity.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



Springville

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DESCRIPTION:

Signs and labels identify problem areas or hazardous materials at a facility. Warning signs, often found at industrial facilities, are a good way to suggest caution in certain areas. Signs and labels can also provide instructions on the use of materials and equipment. Labeling is a good way to organize large amounts of materials, pipes, and equipment, particularly on large sites.

APPROACH:

Signs and labels can be used at all types of facilities. Areas where they are particularly useful are material transfer areas, equipment areas, loading and unloading areas, or anywhere information might prevent contaminants from being released to stormwater.

Signs and labels should be visible and easy to read. Useful signs and labels might provide the following information:

- Names of facility and regulatory personnel, including emergency phone numbers, to contact in case of an accidental discharge, spill, or other emergency.
- Proper uses of equipment that could cause release of stormwater contaminants.
- Types of chemicals used in high-risk areas.
- The direction of drainage lines/ditches and their destination (treatment or discharge).
- Information on a specific material.
- Refer to OSHA standards for sizes and numbers of signs required for hazardous material labeling.

LIMITATIONS:

No limitations.

MAINTENANCE:

- Periodic checks can ensure that signs are still in place and labels are properly attached.
- Signs and labels should be replaced and repaired as often as necessary.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Sorbents are materials that are capable of cleaning up spills through the chemical processes of adsorption and absorption. Sorbents adsorb (an attraction to the outer surface of a material) or absorb (taken in by the material like a sponge) only when they come in contact with the sorbent materials.

Sorbents include, but are not limited to, the following:

- Common materials such as clays, sawdust, straw and fly ash
- Polymers - polyurethane and polyolefin
- Activated Carbon - powdered or granular
- "Universal Sorbent Material" - a silicate glass foam consisting of rounded particles that can absorb the material.

APPLICATION:

Sorbents are useful BMPs for facilities with liquid materials onsite.

INSTALLATION/APPLICATION CRITERIA:

- Personnel should know the properties of the spilled material(s) to know which sorbent is appropriate. To be effective, sorbents must adsorb the material spilled but must not react with the spilled material to form hazardous or toxic substances.
- Apply immediately to the release area.
- Application is generally simple: the sorbent is added to the area of release, mixed well, and allowed to adsorb or absorb.
- Many sorbents are not reusable once they have been used.
- Proper disposal is required.

LIMITATIONS:

- Requires a knowledge of the chemical makeup of a spill (to choose the best sorbent).
- May be an expensive practice for large spills.
- May create disposal problems and increase disposal costs by creating a solid waste and potentially a hazardous waste.

MAINTENANCE:

No information available.

CONSIDERATIONS

- Soils
- Area Required
- Slope
- Water Availability
- Aesthetics
- Hydraulic Head
- Environmental Side Effects



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

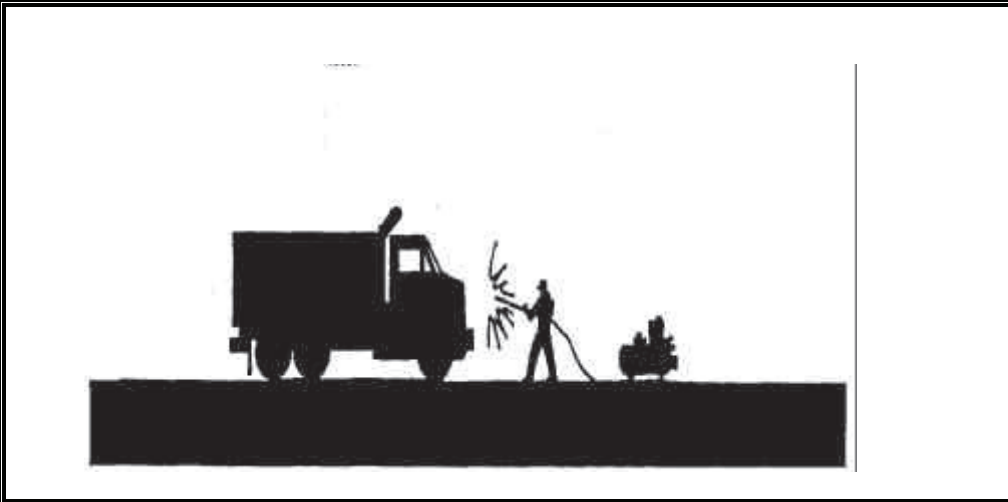
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



Springville

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DESCRIPTION:

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

INSTALLATION/APPLICATION:

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

LIMITATIONS:

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

MAINTENANCE:

- Minimal, some berm repair may be necessary.

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

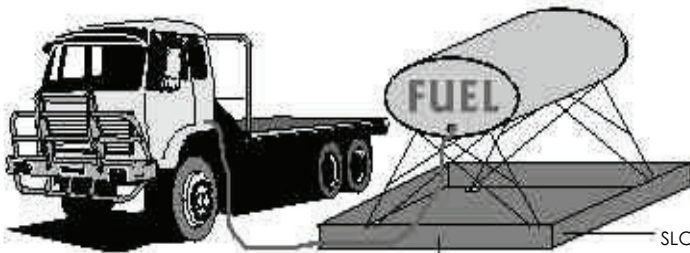
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



SLOPED OR OTHERWISE DESIGNED FOR EASY REMOVAL OF LEAKED FUEL

DESCRIPTION:

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

INSTALLATION/APPLICATION:

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills. Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.(40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

LIMITATIONS:

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

MAINTENANCE:

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

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



Springville

Springville City Corporation
Public Works Department
Engineering Division
110 South Main Street
Springville, Utah 84663
801-491-2780

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

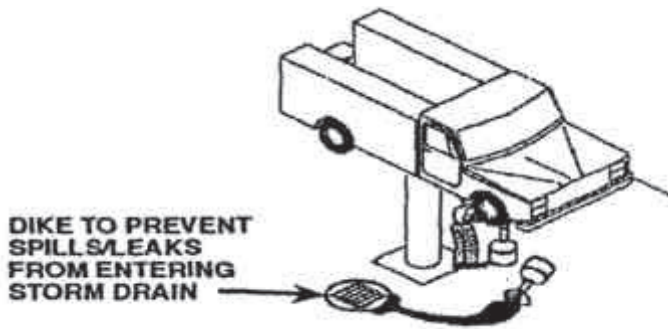
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



(INSIDE MAINTENANCE FACILITY)

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from vehicles and equipment maintenance and repair by running a dry shop.

APPROACH:

- Keep equipment clean, don't allow excessive build-up of oil and grease.
- Keep drip pans or containers under the areas that might drip.
- Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- Inspect equipment for leaks on a regular basis.
- Segregate wastes.
- Make sure oil filters are completely drained and crushed before recycling or disposal.
- Make sure incoming vehicles are checked for leaking oil and fluids.
- Clean yard storm drain inlets regularly and especially after large storms.
- Do not pour materials down drains or hose down work areas; use dry seeping.
- Store idle equipment under cover.
- Drain all fluids from wrecked vehicles.
- Recycle greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- Switch to non-toxic chemicals for maintenance when possible.
- Clean small spills with rags, general clean-up with damp mops and larger spills with absorbent material.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Train employees, minimize use of solvents.

LIMITATIONS:

- Space and time limitations may preclude all work being conducted indoors.
- It may not be possible to contain and clean up spills from vehicles/equipment brought on-site after working hours.
- Dry pans are generally too small to contain antifreeze, which may gush from some vehicles, so drip pans may have to be purchased or fabricated.
- Dry floor cleaning methods may not be sufficient for some spills.

MAINTENANCE:

Should be low if procedures for the approach are followed.

APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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TARGETED POLLUTANTS

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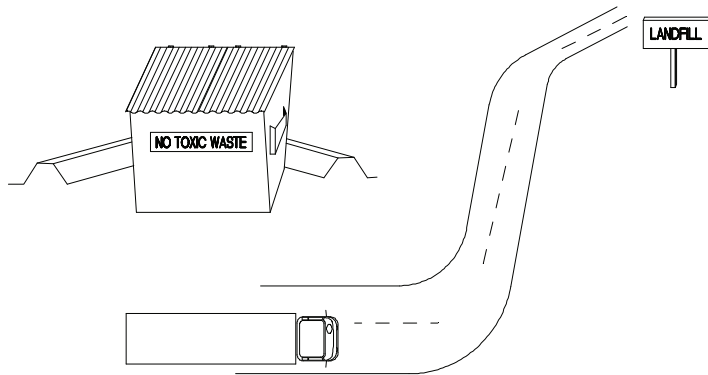
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



DESCRIPTION:

Controlled storage and disposal of solid waste generated by construction activities.

APPLICATION:

All construction sites.

INSTALLATION:

- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

LIMITATIONS:

- On-site personnel are responsible for correct disposal of waste.

MAINTENANCE:

- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document



APPLICATIONS

- Manufacturing
- Material Handling
- Vehicle Maintenance
- Construction
- Commercial Activities
- Roadways
- Waste Containment
- Housekeeping Practices



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DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from waste handling and disposal by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runoff and runoff from waste management areas.

APPROACH:

- Maintain usage inventory to limit waste generation.
- Substitute or eliminate raw materials.
- Modify process or equipment.
- SARA Title III, Section 313 requires reporting for over 300 listed chemicals and chemical compounds. This requirement should be used to track these chemicals although this is not as accurate a means of tracking as other approaches.
- Track waste generated.
- Use design data and review: process flow diagram, materials and applications diagram, piping and instructions, equipment list, plot plan.
- Use economic data and review: Waste treatment and disposal cost. Product utility and economic cost. Operation and maintenance labor cost.
- Recycle materials whenever possible.
- Maintain list of and the amounts of materials disposed.
- Segregation and separate waste.
- Cover, enclose, or berm industrial wastewater management areas whenever possible to prevent contact with runoff or runoff.
- Equip waste transport vehicles with anti-spill equipment.
- Minimize spills and fugitive losses such as dust or mist from loading systems.
- Ensure that sediments or wastes are prevented from being tracked off-site.
- Training and supervision.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

LIMITATIONS:

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

TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Medium
- Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document

Appendix C

Training Log

Appendix D

Spill Reports

NON-STORM WATER DISCHARGE INSPECTION REPORT



Springville

Date of Spill: _____ Time: _____

Location: _____

Date of Investigation: _____ Time: _____

Method of Discovery: _____

REGULATORY AGENCIES NOTIFICATION (document: date, time, person, agency)

Springville City (801-491-2780):

Utah County Health Department: (801-851-7525)

DWQ (801-536-4300, after hours 801-536-4123):

Other: _____

Description and Quantity of Material Spilled:

- Gasoline Diesel Oil Antifreeze Other: _____
- 1 to 5 Gallons 5 to 10 Gallons 10 to 25 Gallons More than 25 Gallons

Source: _____

Cause: _____

Adverse environmental impact (if any):

Any Discharge to Storm Drain and or waters of the U.S.? Yes No Do not know

Immediate remedial actions taken at time of spill:

- Spill Containment Sweeping Absorbent Material Removal from site
- Other: _____

Method of removal and verification: _____

Additional comments: _____

Analytical Monitoring: _____

Enforcement Action: _____

Report prepared by: _____

Signature _____

Date _____

Appendix E
Corrective Action Log

Appendix F

Weekly Visual Inspection Log



Streets/Solid Waste Division

Weekly Visual Inspection Log for Compound, Rodeo Grounds, Land fill.

Check the box if a deficiency is observed, describe the corrective actions taken.						
Name:	Date:	400 South Compound:				
		<input type="checkbox"/> Garbage cans lids closed	<input type="checkbox"/> Parking areas clean	<input type="checkbox"/> Salt pile containment	<input type="checkbox"/> Chemicals, solvents and oils labeled and stored	
		<input type="checkbox"/> Trash picked up	<input type="checkbox"/> Spill clean up	<input type="checkbox"/> Sweep hard surfaces	<input type="checkbox"/> Clean and organize shop	
		Rodeo Grounds:				
		<input type="checkbox"/> Road base containment	<input type="checkbox"/> Stabilized tracking pad	<input type="checkbox"/> Street sweeping	<input type="checkbox"/> Dust control	<input type="checkbox"/> Trash picked up
		Land Fill:				
		<input type="checkbox"/> Prevent runoff to wetlands	<input type="checkbox"/> Trash tracking pad	<input type="checkbox"/> Containment of stock pile materials		
		Corrective Actions:				
Check the box if a deficiency is observed, describe the corrective actions taken.						
Name:	Date:	Shop:				
		<input type="checkbox"/> Garbage can lid closed	<input type="checkbox"/> Parking areas clean	<input type="checkbox"/> Salt pile containment	<input type="checkbox"/> Chemicals, solvents and oils labeled and stored	
		<input type="checkbox"/> Trash picked up	<input type="checkbox"/> Spill clean up	<input type="checkbox"/> Sweep hard surfaces	<input type="checkbox"/> Clean and organize shop	
		Rodeo Grounds:				
		<input type="checkbox"/> Road base containment	<input type="checkbox"/> Stabilized tracking pad	<input type="checkbox"/> Street sweeping	<input type="checkbox"/> Dust control	<input type="checkbox"/> Trash picked up
		Land Fill:				
		<input type="checkbox"/> Prevent runoff to wetlands	<input type="checkbox"/> Trash tracking pad	<input type="checkbox"/> Containment of stock pile materials		
		Corrective Actions:				
Check the box if a deficiency is observed, describe the corrective actions taken.						
Name:	Date:	Shop:				
		<input type="checkbox"/> Garbage can lid closed	<input type="checkbox"/> Parking areas clean	<input type="checkbox"/> Salt pile containment	<input type="checkbox"/> Chemicals, solvents and oils labeled and stored	
		<input type="checkbox"/> Trash picked up	<input type="checkbox"/> Spill clean up	<input type="checkbox"/> Sweep hard surfaces	<input type="checkbox"/> Clean and organize shop	
		Rodeo Grounds:				
		<input type="checkbox"/> Road base containment	<input type="checkbox"/> Stabilized tracking pad	<input type="checkbox"/> Street sweeping	<input type="checkbox"/> Dust control	<input type="checkbox"/> Trash picked up
		Land Fill:				
		<input type="checkbox"/> Prevent runoff to wetlands	<input type="checkbox"/> Trash tracking pad	<input type="checkbox"/> Containment of stock pile materials		
		Corrective Actions:				

Appendix G
Quarterly Comprehensive Inspections



Springville

High Priority Facility SWPPP Compliance Report

Site Name: _____ Inspected By: _____

Date of Evaluation: _____ Start/End Time: _____ Existing Weather Conditions: _____

Date of last rain event > .1" of precipitation: _____ Approximate rainfall: _____

Areas of Industrial activities and materials exposed to stormwater

Area/Activity	Was area Inspected?		Are controls operating effectively		Describe Corrective Action Needed
	yes	no	yes	no	
1. Outdoors and indoor material storage areas					
2. Equipment and vehicle parking areas					
3. Dumpsters					
4. Paved areas					
5. Storm drain inlets and gutters					
6. Indoors working and storage areas					
7. Spill Kits					

Additional Notes:

I certify that this document and all attachments were prepared under my direction. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Inspector Name

Inspector Signature

Date