

# Pleasant Grove



Utah's City of Trees

## **Storm Water Management Plan**

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Updated (Nov 2021):

TABLE OF CONTENTS

# Pleasant Grove



## Utah's City of Trees

.....	1
1.0 Permit Coverage.....	4
2.0 Notice of Intent .....	5
3.0 Special Conditions .....	5
3.1 Discharges to water quality Impaired Waters .....	5
3.2 Nitrogen and Phosphorus Reduction.....	5
3.3 Co-Permittees .....	6
4.0 Storm Water Management Program .....	6
4.1 Requirements.....	6
4.1.1 SWMP .....	6
4.1.2 Documentation and Financial Resources .....	6
4.1.3 BMP's.....	6
4.2 Minimum Control Measures .....	7
4.2.1 Public Education and Outreach on Storm Water Impacts .....	7
4.2.2 Public Involvement/Participation .....	11
4.2.3 Illicit Discharge Detection and Elimination (IDDE).....	13
4.2.4 Construction Site Storm Water Runoff Control .....	17

4.2.5 Long-Term Storm Water Management in New Development and Redevelopment ....	21
4.2.6 Pollution Prevention and Good Housekeeping for Municipal Operations .....	27
4.3 Sharing Responsibility .....	31
4.4 Reviewing and Updating Storm Water Management Programs .....	32
4.4.1 Storm Water Management Program Review .....	32
4.4.2 Storm Water Management Program Update .....	32
5.0 Narrative Standard, Monitoring, Recordkeeping and Reporting .....	32
5.1 Narrative Standard.....	32
5.2 Analytical Monitoring .....	32
5.2.1 Compliance with TDML’s.....	32
5.2.2 Illicit Discharge Detection.....	32
5.2.3 Elective analytical monitoring.....	32
5.3 Non-analytical Monitoring.....	33
5.4 Record Keeping.....	33
5.5 Reporting.....	33

APPENDIX A – Location Map

APPENDIX B – Storm Water System Maps and Inventories

APPENDIX C – Ordinances

APPENDIX D - Standard Operating Procedures (SOP)

APPENDIX E - Standard Forms and Checklists

APPENDIX F – Storm Water Technical Manual and Best Management Practices

APPENDIX G – Sample Maintenance Agreement

APPENDIX H – Preferred Design Specifications

APPENDIX I – Sample Spill Response Plan

APPENDIX J – Spill/Dumping Notification Information

## **INTRODUCTION**

Pleasant Grove City is a community of approximately 39,989 people in northern Utah County (see Appendix A), State of Utah. The City owns and operates a storm drain system to provide a level of protection to its citizens from storm water flows. In 2002 the City prepared a Storm Water Management Plan (SWMP) as required by State and Federal Law in order to obtain permission to discharge storm water to waters of the State. In August 1, 2010 The Utah State Division of Water Quality issued an updated permit which requires the City to update its SWMP in order to maintain permission to discharge to Waters of the State. The City subsequently updated its SWMP in November of 2010. In January 2016 the Utah State Division of Water Quality again issued an updated permit. The City subsequently updated its SWMP in 2016 and 2020. This SWMP represents the latest update and outlines the City's commitments to protect water quality. The SWMP is meant to be a living document and will be reviewed, at a minimum, on a yearly basis and updated as necessary.

### **1.0 PERMIT COVERAGE**

Pleasant Grove City has prepared this SWMP to comply with the Small MS4 General UPDES Permit No. UTR090000 (hereafter Permit) and obtain authority to discharge to waters of the State. The City understands permitted discharge includes storm water and the non-storm water discharges listed below unless they are identified as significant sources of pollutants to waters of the state of as causing or contributing to a violation of water quality standards.

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensate
- Irrigation water
- Springs
- Water from crawl space pumps

- Footing drains
- Lawn watering runoff
- Individual residential car washing
- Flows from riparian habitats and wetlands
- De-chlorinated swimming pool discharges
- Residual street wash water
- De-chlorinated water reservoir discharges
- Discharges of flows from Emergency firefighting activity

## **2.0 NOTICE OF INTENT**

A Notice of Intent (NOI) has been filed with the Division of Water Quality with the submission of the 2010 SWMP. This SWMP update will fall under the 2010 NOI.

## **3.0 SPECIAL CONDITIONS**

### **3.1 DISCHARGES TO WATER QUALITY IMPAIRED WATERS**

Pleasant Grove City discharges storm water to tributaries of Utah Lake which is listed as an impaired water body with respect to Harmful Algal Blooms, Eutrophication, PCB in Fish Tissue, Total Dissolved Solids, and Total Phosphorus as P. No Total Maximum Daily Load (TDML) has been developed by the Division and approved by EPA for Utah Lake. TDML development priority is listed as “low”. Once a TDML is established for Utah Lake, the City’s SWMP will be updated to reflect the listing per permit requirements.

### **3.2 NITROGEN AND PHOSPHORUS REDUCTION**

Pleasant Grove City recognizes the need to address nitrogen and phosphorus in its storm water discharge. In addition to its ongoing public education and outreach efforts to address phosphorus the City will support the Utah County Storm Water Coalition in evaluation, identification, and targeting sources of nitrogen and phosphorus and providing outreach.

The Coalition will determine and target source that are contributing to or have the potential to contribute, nitrogen and phosphorus to the receiving waters of the City. The Coalition will prioritize the targeted sources that are most likely to obtain a reduction in nitrogen and phosphorus through public education. The Coalition will distribute educational materials or equivalent outreach to the prioritized targeted sources. Educational materials or equivalent outreach will describe storm water quality impacts associated with nitrogen and phosphorus in

storm water runoff and illicit discharges, the behaviors of concern, and actions that the target source can take to reduce nitrogen and phosphorus. This effort will be incorporated in the education and outreach strategies provided in accordance with Permit Part 4.2.1.

### **3.3 CO-PERMITTEES**

Utah County Storm Water Coalition was a co-permittee with Pleasant Grove City on some Public Education and Outreach efforts. The Coalition's efforts will continue but they are not considered a co-permittee in this plan update. Their efforts are identified in Section 4.2.1.

## **4.0 STORM WATER MANAGEMENT PROGRAM**

### **4.1 REQUIREMENTS**

#### **4.1.1 SWMP**

This SWMP includes the six minimum control measures described in Section 4.2 of the Permit. This update of the SWMP represents additions, clarifications, etc. that are more specifically identified in the new permit.

#### **4.1.2 Documentation and Financial Resources**

The City has an ongoing documentation process for gathering, maintaining and using information as required by the permit. This process is outlined more fully in the six minimum control measures. A summary of the process is given in the SOP Appendix: *SOP SWMP Implementation and evaluation and SOP Record Keeping*.

The City tracks the number of inspections performed, official enforcement actions taken, and types of public education activities implemented as required. This information is available for review by the Division to measure permit compliance.

The City will secure the resources necessary to meet all requirements of this permit. The City will conduct an annual analysis of the capital and operation and maintenance expenditures necessary and allocate funding to meet the requirements of this permit including the development, implementation and enforcement activities required. A summary of its fiscal analysis shall be submitted with each annual report.

#### **4.1.3 BMP's**

The SWMP contains BMP's that the City will implement for each of the storm water minimum control measures.

The measureable goals for each of the BMP's include the dates the City will undertake the desired action including interim milestones and the frequency of the actions.

The City has designated their Storm Water Coordinator as the person responsible for implementing the BMP's contained within the SWMP. The Storm Water Coordinator is currently Mark Atwood. The person in this position is changed from time to time and will be identified by name in each annual report.

## **4.2 MINIMUM CONTROL MEASURES**

The Pleasant Grove City SWMP covers the six minimum control measures required by the Permit. Each minimum control measure is covered in the following sections.

### **4.2.1 Public Education and Outreach on Storm Water Impacts**

Outreach and educational efforts will include a multimedia approach including direct mail, internet, and notice boards. These efforts will target specific audiences including: residents, institutions, industrial, and commercial facilities, developers and contractors, and MS4-owned or operated facilities. The following sections detail these efforts.

#### ***4.2.1.1 Target Specific Pollutants and Pollutant Sources***

Pleasant Grove will target the following pollutants and pollutant sources in their education and outreach efforts.

- Total Phosphorus
- Total Dissolved Solids
- Nitrogen
- Sediment
- Trash

Utah Lake is on the States 303C list of impaired waters with respect to Total Phosphorus and Total Dissolved Solids and therefore the City will focus on these items. Nitrogen is added to the program based on the updated permit requirements. Sediment and trash are of interest to the City because of potential impairment of receiving bodies of water and the maintenance effort required to clean these items from local storm drain facilities.

#### ***4.2.1.2 General Public Education***

Pleasant Grove will provide educational material to the general public through the following methods: Monthly newsletter and utility billings, City web site, and existing Utah County storm water coalition advertisements. These efforts will cover the following topics at a minimum:

- Maintenance of Septic Systems
- Lawn Care

- On-site infiltration
- Automotive work and car washing
- Swimming Pool water disposal
- Pet waste

The information presented to the general public on these items will include a focus on the specific pollution and pollution sources identified in Section 4.2.1.1. It will also include information specific to nutrients in storm water according to section 3.2 of the permit.

#### ***4.2.1.3 Institutional, Industrial, and Commercial Education***

Pleasant Grove will provide educational material to institutional, industrial, and commercial facilities through the following methods: Monthly newsletter and utility billings, City web site, business license renewal, and existing Utah County storm water coalition advertisements. These efforts will cover the following topics at a minimum.

- Proper Lawn Maintenance (use of Pesticides, herbicides, and fertilizer)
- On-site infiltration
- Building and Equipment maintenance (proper management of waste water)
- Use of salt and other de-icing materials (cover/prevent runoff to storm system and contamination to ground water)
- Proper storage of materials (emphasize pollution prevention)
- Proper management of water materials and dumpsters (cover and pollution prevention)
- Proper management of parking lot surfaces (sweeping)

The information presented to business and institutional facilities on these items will include a focus on the specific pollution and pollution sources identified in Section 4.2.1.1. It will also include information specific to nutrients in storm water according to section 3.2 of the permit.

#### ***4.2.1.4 Development Community Education***

The City will provide and document information given to engineers, construction contractors, developers, development review staff, and land use planners concerning the development of storm water pollution prevention plans (SWPPPs). This portion of the SWMP will be addressed in Minimum Control Measure #4 - Construction Site Storm Water Runoff.



#### ***4.2.1.5 MS4-owned or Operated Facilities***

Pleasant Grove City will continue a yearly employee training program concerning the prohibition against and the water quality impacts associated with illicit discharges and improper disposal of waste. At a minimum the City will cover the following topics.

- Equipment inspection to ensure timely maintenance
- Proper storage of industrial materials (emphasize pollution prevention)
- Proper management and disposal of wastes
- Proper management of dumpsters
- Minimization of use of salt and other de-icing materials (cover/prevent runoff to MS4 and ground water contamination)
- Benefits of appropriate on-site infiltration (areas with low exposure to industrial materials such as roofs or employee parking)
- Proper maintenance of parking lot surfaces (sweeping)

#### ***4.2.1.6 City Planners Education***

Pleasant Grove City will encourage their MS4 engineers, development and plan review staff, land use planners, and others as applicable to attend training courses in Low Impact Development (LID) practices, green infrastructure practices, and communicate the specific requirements for post-construction control and the associated Best Management Practices (BMPs) chosen within the SWMP. These training courses will be documented by the City's Storm Water Coordinator.

#### ***4.2.1.7 Program Effectiveness***

The effectiveness of the City's public education and outreach efforts will be measured through surveys, questionnaire, and quizzes with training. The City will send surveys with the monthly water bill and request the public to fill out and return every five years. A survey/questionnaire will be posted on the City's web site for electronic submittal every five years. All City sponsored training will include quizzes. The City also will track and compare violations from year to year to measure program effectiveness.

#### ***4.2.1.8 BMP Selection Process***

The above mentioned BMP's were selected because they would reach all of the residents and businesses within the City because all receive monthly utility billings and many have access to the internet.

#### 4.2.1.9 Control Measure 1 Summary

The following Table 1 shows a summary of Best Management Practices (BMP's) for Control Measure #1

**Table 1 - Control Measure #1 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>A. Develop Web Based Educational Program</b>	Include Educational Material Monthly on City Web Site	Monthly	Included 2021
<b>B. Distribute Flyers for Institutional, Industrial and Commercial</b>	Include Flyers With Business License Renewal	Annually	Distributed 2021
<b>C. Distribute Flyers in Utility Bills</b>	Distribute Flyers to all Utility Bill Recipients	Annually	Distributed 2021
<b>D. Include Material in City Newsletter</b>	Include Educational Material in City Newsletter	Annually	Included 2021
<b>E. Support Utah County Coalition</b>	Pay Dues and Document School Programs Conducted by Coalition	Annually	Paid and Documented 2021
<b>F. Employee Training</b>	Conduct Training for City Employees	Annually	Conducted 2021
<b>G. Measure Program Effectiveness</b>	Web site and water bill survey	Every Five Years	planned 2022

#### 4.2.1.10 Modifications to Previous Plan

- Changed wording of sections to match updated topic details.
- Updated table.

#### **4.2.2 Public Involvement/Participation**

The BMPs within this control measure were developed to provide ongoing opportunities for public involvement and participation. City will provide ongoing opportunities for public involvement and participation through one or more of the following:

- Advisory Panels
- Public Hearings
- Watershed Committees
- Stewardship Programs
- Environmental Activities
- Volunteer Opportunities
- Other Similar Activities

These opportunities shall be provided at a minimum of two times annually.

City will have a public hearing when submitting annual report.

City has annual spring and fall cleanup activities and will add focus on Storm Water.

##### ***4.2.2.1 Policy Directive***

Pleasant Grove has developed a policy directive which will create opportunities for the public to provide input during the decision making processes involved in the development, implementation and update of the SWMP. The policy directive is as follows:

“Pleasant Grove City is developing, updating, and implementing a Storm Water Management Plan (SWMP) for the City according to the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended and the Federal Water Pollution Control Act (33 U.S.C. 1251 et. seq., as amended to date), and the rules and regulations made pursuant to those statutes. Pleasant Grove City encourages the public to become involved in the development, updating and implementation of the SWMP including development and adoption of all required ordinances and regulatory mechanisms. The City shall follow the program outlined in the Public Involvement/Participation control measure section of its SWMP to encouraging public input.”

##### ***4.2.2.2 Initial Public Review***

Pleasant Grove made the SWMP available to the public for review and comment. The plan was posted on the City’s web site with a request for public comment. The plan was available for review at City Hall, Community Development, and Public Works. Comments forms were available for the public to provide written comments. One public hearing was held to allow the public to comment on the plan.

In addition the SWMP was given to the Chamber of Commerce to review and provide input.

#### **4.2.2.3 Ongoing Public Review**

Pleasant Grove City maintains a current version of the SWMP on the City Website. The website requests and allows public to provide input and comment on the plan.

Annually a report will be submitted to the City Council in a regularly scheduled public meeting to discuss the City’s storm water system including the SWMP. The City will request input from the Chamber of Commerce prior to this presentation.

As scheduled and as needed the City’s SWMP will be updated and modified. The City will follow the same procedure of soliciting public input as outlined in Section 4.2.2.2 when modifying or updating the SWMP.

#### **4.2.2.4 Public Notice**

Pleasant Grove City currently follows the State standard public notice requirements for all public hearings. The City will follow the same requirements related to public hearings on its storm water management program. Public hearing advertisements will be noticed on the City’s Website, City library, and other prominent City offices as well as the States notification web site.

#### **4.2.2.5 Control Measure #2 Summary**

The following Table 2 shows a summary of Best Management Practices (BMP’s) for Control Measure #2

**Table 2 - Control Measure #2 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>A. Ongoing Public Involvement/Participation</b>	Request Input From Chamber of Commerce	Annually Beginning 2010	Obtained 2015
	Storm Water Emphasis in City-Wide Fall and Spring Cleanup	Annually Beginning 2022	
<b>B. Make Storm Water Pollution Prevention Documents and Information Available to the Public</b>	Post Documents and Information on Web Site	Annually Beginning 2010 and within 120 days of effective date of new permit	Available 2021

<b>C. Allow Public Review of Annual Reports</b>	Post Annual Reports on Web Site	Annually Beginning 2010	Posted 2021
<b>D. Conduct Public Hearings</b>	Hold annual public hearing	Annually Beginning 2010	Held 2021

#### ***4.2.2.6 Modifications to Previous Plan***

- Added clarification on public involvement opportunities per new permit requirements.
- Remove Neighborhood Committees from plan as they have been disbanded.
- Updated table.

#### **4.2.3 Illicit Discharge Detection and Elimination (IDDE)**

The following chapter covers the Illicit Discharge Detention and Elimination minimum control measure of the City’s SWMP.

##### ***4.2.3.1 Current Storm Sewer System Map***

The City maintains and will update on a yearly basis maps of its municipal storm water system including the names and locations of all state waters that receive storm water discharge and the outfalls where storm water is discharged. Figure 1 in Appendix B shows the current storm water system of the City. Figure 2 shows the outfalls of the City storm water system into waters of the State.

##### ***4.2.3.2 Prohibition of Non-storm Water Discharges***

The City prohibits non-storm water discharges to the MS4, including spills, illicit connections, illegal dumping and sanitary sewer overflows. The City’s storm water ordinance is included in Appendix C. The ordinance gives adequate legal authority to detect, investigate, eliminate, and enforce against non-storm water discharges, including illegal dumping, into the MS4.

##### ***4.2.3.3 Detect and Address Non-storm Water Discharges***

The City has developed and implemented procedures to detect and address non-storm water discharges that cover the requirements in Section 4.2.3.3 of the Permit. The standard operating procedures for detecting and addressing non-storm water discharges is located in the Appendix D.

Appendix B-3 shows the priority areas for IDDE. Appendix B-4 shows the priority list of areas shown in B-3.

Field assessment of storm water outfalls will occur as per Section 4.2.3.3 of the Permit. The Outfall Reconnaissance Inventory form in the Appendix E will be utilized to document inspection activities.

Pleasant Grove City will notify the Division if it discovers or suspects that a discharger may need a separate UPDES permit (e.g., Industrial Storm Water Permit, Dewatering Permit).

#### ***4.2.3.4 Procedures for Tracing an Illicit Discharge***

The City has developed and implemented procedures for tracing an illicit discharge that covers the requirements in Section 4.2.3.4 of the Permit. The standard operating procedure for tracing an illicit discharge is located in the Appendix D.

#### ***4.2.3.5 Procedures for Characterizing an Illicit Discharge***

The City has developed and implemented procedures for characterizing the nature of, and the potential public or environmental threat posed by an illicit discharge that covers the requirements in Section 4.2.3.5 of the Permit. The standard operating procedure for evaluating an illicit discharge is located in the Appendix D.

#### ***4.2.3.6 Procedures for Ceasing Illicit Discharge***

The City has developed and implemented procedures for ceasing illicit discharge that cover the requirements in Section 4.2.3.6 of the Permit. The standard operating procedure for ceasing illicit discharge is located in the Appendix D.

#### ***4.2.3.7 Public Education***

The City will inform public employees, businesses, and the general public of hazards associated with illicit discharge and improper disposal of waste through existing educational efforts outlined in Section 4.2.1 Public Education and Outreach and Section 4.2.3.11 – 12.

#### ***4.2.3.8 Household Hazardous Waste Program***

The City encourages proper disposal of household hazardous waste by supporting the Utah County hazardous waste program. The City also has a drug drop off box at the dispatch office for citizens to dispose of prescription or other drugs.

#### ***4.2.3.9 Reporting Hotline***

The City will utilize the public works department phone number (801-785-2941) and (801-420-0554) after hours as a hotline for the public to report spills and other illicit discharges. This number will be publicized in the City's website, newsletter and other public education efforts. A written record shall be kept of all calls received, all follow-up actions taken, and any feedback received from public education efforts. Appendix E includes an Illicit Detection Hotline Reporting form that will be utilized in this effort.

Appendix D includes a flow chart in Spill/Dumping Response Flowchart SOP that shows the procedures for responding to public referrals of illicit discharges.

**4.2.3.10 Program Evaluation and Assessment**

The City will evaluate and assess their IDDE program on an annual basis in conjunction with their annual report. This evaluation and assessment will follow the IDDE Evaluation and Assessment SOP as shown in Appendix D. The City has developed and maintains a data base for mapping, tracking of the number and type of spills or illicit discharges identified and inspections conducted. Figure B-5 in Appendix C shows the locations of spills and illicit discharges.

**4.2.3.11 Training of Storm Water Employees**

The City will include IDDE training in its mandatory annual training for City employees as part of Control Measure #1. This training will include field staff whose responsibilities might bring them into contact with or otherwise observe an illicit discharge or illicit connections to the City’s storm drain system. It will also include office personnel who might receive initial reports of an illicit discharge. The training will cover how to identify a spill, an improper disposal, or an illicit connection to the storm drain system and proper procedures for reporting the activity. The training will also include identification, investigation, termination, cleanup, and reporting of illicit discharges including spills, improper disposal, and illicit connections.

**4.2.3.12 Rights of Division**

The City recognizes the Division’s right to request documentation or further study according to Section 4.2.3.13 of the Permit.

**4.2.3.13 Control Measure #3 Summary**

The following Table 3 shows a summary of Best Management Practices (BMP’s) for Control Measure #3

**Table 3 - Control Measure #3 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measureable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>System Mapping</b>	Update Maps	Annually	Updated 2021
<b>Storm Water Ordinance</b>	Review Ordinance	Annually	Reviewed 2021

	Update Ordinance	As-needed	2021
<b>Procedures to Detect and Address Non-storm Water Discharges</b>	Update SOP	Annually	Reviewed 2021
	Inspect High Priority Areas	Annually	Inspected 2021
	Inspect 20 % of outfalls	Annually	Inspected 2021
	Notify Division of Water Quality if separate discharge permit is required	As-needed	Date
<b>Procedures to Trace Source of Illicit Discharge</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As-needed	Updated 2010
<b>Procedures to Characterize Illicit Discharge</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As-needed	Updated 2010
<b>Procedures to Cease Illicit Discharge</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As-needed	Updated 2010
<b>IDDE Education (Public)</b>	Provide Educational Material	Annually	Provided 2021
<b>Household Hazardous Waste Program</b>	Provide Program	Annually	Provided 2021
<b>Hotline</b>	Advertise Number	Annually	Advertised 2021



<b>Spill/Dumping Response</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As-needed	Updated 2010
<b>Training</b>	Storm Drain Employees	Annually	Completed 2021
	Field Staff and office Personnel	Annually	Completed 2021
<b>Program Evaluation and Assessment</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As-needed	Updated 2010

**4.2.3.14 Modifications to Previous Plan**

- Clarified that City has legal authority to implement and cites ordinance.
- Updated table
- Storm water ordinance updated

**4.2.4 Construction Site Storm Water Runoff Control**

The following chapter covers the Construction Site Storm Water Runoff Control minimum control measure of the City’s SWMP.

**4.2.4.1 Develop and Adopt Ordinance**

The City updates its Storm Water Ordinance and regulatory procedures as needed to reflect the requirements of the Permit. The ordinance will apply to all development sites and redevelopment sites greater than or equal to one acre, or those sites less than one acre but part of a larger common plan of development or sale. The ordinance and regulatory procedures are equivalent to the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTRC090000. The ordinance and regulatory procedures include such local requirements as are beneficial to the City overall discharge goals. The ordinance and regulatory procedures require construction operators to prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs as necessary to protect water quality, reduce the discharge of pollutants, and control waste. The ordinance and regulatory procedures will include a provision for access by qualified personnel to inspect BMPs on private property. The City currently requires a SWPPP with all construction.

The City's current storm water ordinance is included in this program as Appendix C.

The City's standard plans and specifications and storm water technical manual as adopted and updated from time to time provide specific authority to require construction sites to control storm water runoff, develop SWPPP plans, and allow inspections. The manual requires construction operators obtain coverage under the current UPDES storm water general permit.

#### ***4.2.4.2 Develop Enforcement Strategy and Implement Ordinance***

The City has developed an enforcement strategy and implemented the enforcement provisions of the ordinance. The main enforcement strategy is to include escalating enforcement procedures and actions. These escalating enforcement procedures and actions are included in the City's storm water ordinance and this program.

The City has developed an SOP to implement Control Measure #4 and it includes specific processes and sanctions to minimize the occurrence of, and obtain compliance from violators which shall include appropriate, escalating enforcement procedures and actions. The SOP includes documentation and tracking procedures. A copy of the SOP can be seen in Appendix D.

#### ***4.2.4.3 SWPPP Review***

The City has developed an SOP for site plan review prior to construction. The City reviews all Storm Water Pollution Prevention Plans (SWPPPs) as part of the normal development review process to ensure that plans include long-term storm water management measures that meet the requirements of this minimum control measure. The City has created a site plan review checklist with respect to storm water management and document reviews in the Planning Department project folders. A copy of the SOP and checklist is included in Appendix D.

A SWPPP is required for all commercial sites within the City and all other construction projects that disturb greater than or equal to one acre including those that disturb less than one acre that are part of a larger common plan or sale. A record will be kept of all material associated with each SWPPP for a period of five years or until construction is completed, whichever is longer. All projects that require a SWPPP are required to obtain a permit from the State of Utah Division of Water Quality according to the UPDES Storm Water General Permit for Construction Activities, UTRC00000. They are also required to utilize the SWPPP template provided by the Division.

Each project has a pre-construction meeting where the City discusses various construction items. During this meeting the City will review the SWPPP including the construction BMPs and post construction BMPs. Also discussed will be any potential water quality impacts and procedures for a pre-construction review including the use of a checklist.

The review of each project shall include evaluation of opportunities for the use of low impact design (LID), and green infrastructure and when opportunities exist, encourage that such BMP's to be incorporated into the site design.

The review checklist will include identifying priority construction sites per Section 4.2.4.3 of the permit. These sites will be subject to additional inspections.

#### ***4.2.4.4 Construction Site Inspection***

The City has developed an SOP for construction site inspection and enforcement. The SOP clearly defines who is responsible for site inspections as well as who has authority to implement enforcement procedures. The ordinance provides the authority to impose sanctions and ensure compliance. These procedures and regulatory authority will be written and documented in the SWMP as part of the SOP. The SOP can be found in Appendix D.

The City's standard plans and specifications and storm water technical manual as adopted and updated from time to time provide specific authority to inspect construction sites as required.

Construction site inspections shall be performed by qualified personnel at least monthly using the Construction Storm Water Inspection Form provided by the Division. Inspection of priority construction sites shall be performed at least bi-weekly utilizing the same form. A copy of the inspection form can be found in Appendix E.

All phases of construction shall be inspected including prior to land disturbance, during active construction, and following active construction. A copy of the Notice of Termination (NOT) shall be required to be submitted to the Storm Water Coordinator so they can review and inspect before the City will sign off on any completed project.

The City will take any necessary follow-up actions to ensure compliance in accordance with the enforcement SOP. These follow-up and enforcement actions will be tracked and documented.

The City will ensure that all its inspectors are certified and require the same from contractors in according with the UPDES Storm Water General Permit for Construction Activities, UTRC00000.

City has published a hotline phone number for the public to report construction storm water violations as part of section 4.3.2.9. Included is the requirement to document violations, enforcement actions, and corrective actions.

#### ***4.2.4.5 Training***

The City will include construction site storm water runoff control training in its mandatory annual training for City employees as part of Control Measure #1. This training will include staff whose responsibilities include permitting, plan review, construction site inspections, and enforcement. It will also include third-party inspectors and plan reviewers as well. Records will

be kept of the dates, activities or course descriptions, and names and positions of staff in attendance.

**4.2.4.6 Record Keeping**

The City currently maintains records of inspections and enforcement actions in a file cabinet along with the SWMP Program. The City has developed, adopted and implemented a written SOP to maintain these and other records as required. These records will be maintained for a period of five years or until construction is completed, whichever is longer. A copy of this SOP can be seen in Appendix D.

**4.2.4.7 Control Measure #4 Summary**

The following Table 4 shows a summary of Best Management Practices (BMP’s) for Control Measure #4

**Table 4 - Control Measure #4 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>Ordinance to Require the Use of Erosion and Sediment Control Practices at Construction Sites</b>	Review Ordinance	Annually	Reviewed 2021
	Update Ordinance	As needed	2021
<b>Enforcement Strategy</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As needed	Updated 2012
<b>SWPPP Review</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As needed	Updated 2015
<b>Construction Site Inspection</b>	Review SOP	Annually	Reviewed 2021

	Update SOP	As needed	Updated 2021
<b>Training</b>	Employees	Annually	Provided 2021
	Third-party Reviewers and Inspectors	Annually	Provided 2021
<b>Record Keeping</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As needed	Updated 2012

**4.2.4.8 Modifications to Previous Plan**

- Updated table
- Storm water ordinance updated

**4.2.5 Long-Term Storm Water Management in New Development and Redevelopment**

The following chapter covers the Long-Term Storm Water Management in New Development and Redevelopment (post-construction storm water management) control measure of the City’s SWMP.

**4.2.5.1 Post-construction Controls**

It is the intent of this program to implement standards that will prevent or minimize impacts to water quality. This program will include non-structural BMP’s.

The City will annually review and update its Sensitive Lands Ordinance as appropriate with respect to the following areas.

- Minimize development in areas susceptible to erosion and sediment loss;
- Minimize the disturbance of native soils and vegetation;
- Preserve areas in the municipality that provide important water quality benefits;
- Implement measures for flood control;
- Protect the integrity of natural resources and sensitive areas.

The City's storm water management program shall be updated to include the specifics of the sensitive lands ordinance as it is updated. A copy of the current sensitive lands ordinance is included in Appendix C.

The City has developed a process to implement a Low Impact Development (LID) approach. The City requires new development and re-development projects disturbing greater than or equal to one acre including projects less than one acre that are part of a larger common plan of development or sale to manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 80<sup>th</sup> percentile rainfall event. Only redevelopment projects that increase impervious surfaces by greater than 10% shall be included in this requirement and they shall only be required to manage the net increase in storm water runoff as a result of redevelopment. The LID approach includes, where feasible, infiltration, evapotranspiration, or harvest and use of storm water to protect water quality. Structural controls may include green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales. When such LID approaches are proposed by the developers, they will be evaluated and accepted or rejected by City staff based on their effect on groundwater and slope stability, the ability to effectively maintain the control, clogging or obstruction issues, freeze-thaw problems and or other issues. If LID practices are not feasible, they will be documented on a case-by-case basis. The LID approach, evaluation procedure, BMP's, and 80<sup>th</sup> percentile storm data is outlined in Appendix F – Storm Water Technical Manual and Appendix L LID handbook

The City will develop a LID "Bank" for use on City projects and potentially for private development projects. This Bank will may include infiltration of storm water and or stream water into the aquifer to offset direct storm water runoff in other areas of the City. It may also include rainwater harvesting and reuse through the City's pressurized irrigation system.

The City has developed a plan to retrofit existing developed sites that are impacting water quality. The City will identify sites that are adversely impacting water quality through their illicit detection and elimination program. All sites that are adversely affecting water quality will be required to develop a long term storm water management plan, enter into a maintenance agreement, and install controls, processes and procedures to protect water quality. The retrofit plan emphasizes controls that infiltrate, evapotranspire or harvest and use storm water discharges as appropriate. The plan includes a ranking of potential control measures as outlined in Section 4.2.5.3.3 of the Permit. The City will also require those businesses that are adversely impacting water quality to obtain a separate industrial storm water permit with the State if applicable.

The City has developed and defined a specific hydrological method to calculating runoff volumes and flow rates to ensure consistent sizing of structural BMP's in their jurisdiction and to facilitate plan review. This method is outlined in the City's Storm Water Technical Manual included as Appendix F.

#### ***4.2.5.2 Regulatory***

The City has a Storm Water Ordinance and regulatory processes that reflects the requirements of the Small MS4 General UPDES Permit. The ordinance and regulatory processes applies to all development sites and redevelopment sites greater than or equal to one acre, or those sites less than one acre but part of a larger common plan of development or sale. The objective of this control measure is for the hydrology associated with the new development to mirror the pre-development hydrology as much as possible. Hydrology controls shall not replace required water quality controls. The ordinance and regulatory processes include such local requirements as are beneficial to the City's overall discharge goals. The ordinance and regulatory processes require BMP selection, design, installation, operation and maintenance standards necessary to protect water quality and reduce the discharge of pollutants to the MS4. The ordinance and regulatory processes apply to private as well as public development sites including roads. The ordinance and regulatory processes are equivalent to the technical requirements set forth in the Permit.

The City's current storm water ordinance is included in this program as Appendix C.

The City has developed an enforcement strategy and implemented the enforcement provisions of the ordinance. The main enforcement strategy is to include escalating enforcement procedures and actions. These escalating enforcement procedures and actions have been developed as part of the City's storm water ordinance and this plan and are included in Appendix D as Post-Construction Ordinance Enforcement SOP.

Development of the City's storm water ordinance and regulatory processes included documentation of how it will protect water quality and reduce the discharge of pollutants to the MS4. Documentation will include:

- How long-term storm water BMP's were selected;
- The pollutant removal expected from the selected BMP's; and
- The technical basis which supports the performance claims for the selected BMP's.

The City has developed an SOP for site inspection and enforcement of post-construction storm water control measures. This SOP can be found in Appendix D. The City's storm water ordinance and regulatory processes developed as part of Section 4.2.5.1 covers inspection and enforcement requirements from Section 4.2.5.2 of the Permit. The City inspects the installation of all long term storm water controls at least once during construction by qualified personnel and that construction is verify upon completion to ensure the BMPs were constructed as designed.

The City requires all new and redevelopment to enter into a maintenance agreement that will allow the City to have access to inspect and maintain long term controls as required. The maintenance agreement requires the owner of the development or redevelopment to maintain and inspect all long term storm water controls. All maintenance agreements and inspection reports shall be maintained by the City as part of its inventory of all post-construction structural storm water control measures. A copy of the maintenance agreement can be found in Appendix G.

#### ***4.2.5.3 Plan Review***

The City has developed and implemented procedures for site plan review prior to construction. The City reviews all Storm Water Pollution Prevention Plans (SWPPPs) as part of the normal development review process to ensure that plans include long-term storm water management measures that meet the requirements of this minimum control measure. The City has created a site plan review checklist with respect to storm water management and document reviews in the Planning Department project folders. A copy of the checklist is included in Appendix D.

The City provides developers and contractors with preferred design specification to more effectively treat storm water for different development types. These are included in Appendix H. This information is given to contractors and developers when they commence the development process in the City. The City regularly holds informational meetings with developers and contractors to provide them with the latest development standards. The City will document when these materials are given to developers and contractors.

#### ***4.2.5.4 Inventory***

The City maintains an inventory of all post-construction structural storm water control measures installed at new development and re-development sites. This inventory includes project name, owner's name and contact information, location, start/end date, etc. It shall also include the following for each project:

- Short description of each storm water control measure (type, number, design or performance specifications);
- Short description of maintenance requirements (frequency of required maintenance and inspections); and
- Inspection information (date, findings, follow up activities, prioritization of follow-up activities, compliance status).
- Storm water calculations
- Maintenance agreement



The inventory will be updated as appropriate to reflect changes in specific control measures implemented at the site or property ownership. The inventory shall be kept in a file cabinet along with the SWMP in the Public Works Building. The current inventory can be seen in Table B-4 in appendix B.

**4.2.5.5 Staff Training**

As part of its mandatory annual training and educational process, the City trains its staff involved with post-construction storm water management, planning and review, and inspections and enforcement. Training shall be provided or made available for staff in the fundamentals of long-term storm water management through the use of structural and non-structural control methods. Records of training shall be kept including dates, activities or course descriptions, and names and positions of staff in attendance. Training shall occur within 60 days of hire and annually thereafter at a minimum.

**4.2.5.6 Control Measure #5 Summary**

The following Table 5 shows a summary of Best Management Practices (BMP’s) for Control Measure #5

**Table 5 - Control Measure #5 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measureable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>Ordinance to Mandate Controls of Quality and Quantity of Post Construction Storm Water Runoff</b>	Review Ordinance	Annually	Reviewed 2021
	Update Ordinance	As needed	2021
<b>Develop Enforcement Strategy</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As needed	Updated 2012

<b>Review and Update Development Code With Respect to Section 4.2.5.3</b>	Review and update Development Code	As needed	Reviewed 2012
<b>Retrofit Program</b>	Review Program	Annually	Reviewed 2021
	Update Program	As needed	Updated 2013
<b>Hydrologic Method</b>	Review Method	Annually	Reviewed 2021
	Update Method	As needed	Updated 2020
<b>Site Plan Review Procedures</b>	Review	Annually	Reviewed 2021
	Update Site Plan Review Procedures	As needed	Updated 2020
<b>Storm Water Technical Manual</b>	Review Manual	Annually	Reviewed 2021
	Update Manual	As needed	updated 2020
<b>Inspection and Enforcement</b>	Review SOP	Annually	Reviewed 2021
	Update SOP	As needed	Updated 2021
	Document Inspection and Enforcement	Ongoing	Ongoing
<b>City Staff Education</b>	Yearly Training	Annually	Provided 2021
<b>Maintain Inventory</b>	Update Inventory	Annually	Updated 2021

#### ***4.2.5.9 Modifications to Previous Plan***

- Storm water ordinance has been updated.
- Re-order sections to match permit.
- Added 80<sup>th</sup> percentile storm water management evaluation, review, and implementation requirements.
- Table Updated

#### **4.2.6 Pollution Prevention and Good Housekeeping for Municipal Operations**

The following chapter covers the pollution prevention and good housekeeping for municipal operations minimum control measure of the City's SWMP.

##### ***4.2.6.1 Inventory of Permittee-Owned or Operated Facilities***

The City has prepared an inventory of all their owned or operated facilities. The inventory is included in the Appendix B to this report as Table B-6. This list will be reviewed and updated annually with the full Storm Water Management Plan.

##### ***4.2.6.2 Assessment of Permittee-Owned or Operated Facilities***

The inventory of permittee-owned or operated facilities has been assessed for their potential to discharge to storm water the following typical urban pollutants: sediment, nutrients, metals, hydrocarbons, pesticides, chlorides, and trash. Other pollutants such as bacteria, chlorine, organic matter, etc. are included. In addition TDS is included because of Utah Lake which is listed as an impaired water body with respect to Total Phosphate and Total Dissolved Solids. The inventory shown in Table B-6 of the appendix includes the assessment. The assessment was performed and a numerical ranking was assigned based on the following criteria:

1. No contaminants available for discharge
2. Small amounts of contaminants available for discharge with good structural controls
3. Significant amounts of contaminants available for discharge with good structural controls or small amount of contaminants available for discharge with poor structural controls
4. Significant amounts of contaminants available for discharge with poor structural controls
5. Large amount of contaminants available for discharge that are uncontrolled, have a history of past problems or with known discharges

##### ***4.2.6.3 High Priority Ranking***

The inventory and assessment of permittee-owned or operated facilities has been reviewed and a "High Priority" ranking has been assigned to those facilities or operations that have a high potential to generate storm water pollutants. The inventory shown in Table B-6 of the Appendix B includes the high priority ranking. The following factors were considered when assigning a high priority ranking:

- A. Amount of urban pollutants stored at the site (small versus large)

- B. Improperly stored materials (proper versus improper storage)
- C. Activities that must be performed outside (inside versus outside)
- D. Proximity to water bodies (adjacent versus distant)
- E. Poor housekeeping practices (good versus poor practices)
- F. Discharge of pollutants of concern to impaired waters (TDS and nutrients for Utah Lake)

The following method was used to assign a high priority to a site:

- 1. All sites with a numerical ranking of 5 on any of the pollutants.
- 2. Sites with a numerical ranking of 4 if factors B, C, D, E, & or F applies
- 3. Sites with a numerical ranking of 3 if factor F applies

#### ***4.2.6.4 Facility Specific SOP***

The inventory and assessment performed in Sections 4.2.6.1 through 3 have identified four high priority sites for the City. These sites include the public works building and site, the Pipe Plant area, the rodeo grounds, and the cemetery. A facility specific SOP has been created for each site and are included in the SWMP in Appendix D.

#### ***4.2.6.5 Inspections***

Individual SOP's for permittee-owned or operated facilities will include the following inspections:

- 1. Weekly visual inspections for High Priority facilities
- 2. Semi-annual comprehensive inspections of High Priority facilities
- 3. Annual visual observation of storm water discharges for High Priority facilities.

The SOP's include specific instructions on inspections, documentation, and corrective action if necessary. SOP's can be found in Appendix D.

#### ***4.2.6.6 SOP's for Permittee Owned Sites***

General SOP's have been created for the facilities listed in Sections 4.2.6.4.1 through 4.2.6.4.7.

The City has developed an inventory of all floor drains inside City owned or operated facilities. The City will ensure they drain to the proper location and the inventory will be updated on a yearly basis. A copy of the inventory has been included in the updated SWMP in Appendix B.

The City has an inventory, including a map, of all storm drains on City owned or operated facilities. The inventory will be updated on a yearly basis. The map can be seen in Appendix B.

#### ***4.2.6.7 Third Party and Private Development Maintenance***

The City does not contract with a third-party to conduct municipal maintenance. If the City chooses to contract with a third-party in the future they will be held to the same standard as the City. Private developments are required to conduct their own maintenance according to Control Measure # 5. All new and redevelopment projects are required to enter into a maintenance agreement with the City. A sample copy of the maintenance agreement is given in Appendix G.

#### ***4.2.6.8 Flood Management Structural Controls***

The City has developed and implemented a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the City or discharge to the MS4. The process is included in the City's development *SWPPP Review and Approval SOP* in Appendix D. In addition to the normal review checklist the following procedures have been added:

- Does the site have a potential to discharge pollutants of concern as listed in Section 4.2.1.1 to the MS4?
  - If so, then do the proposed controls adequately limit or remove the pollutants of concern?
  - If not then determine and require the best available controls to limit or remove the pollutants.
- Do the controls have adequate access for City or other maintenance personnel and equipment?
  - If not then require adequate access in the design.
- Do the hydraulic controls adequately mimic pre-development storm water flows?
  - If not, then require modified hydraulic controls to more closely mimic pre-development storm water flows.

The City has an inventory of all flood management structural controls within its jurisdiction. All existing flood management control structures shall be assessed to determine whether changes or additions should be made to improve water quality. Approximately 20 percent of all existing flood management control structures will be assessed each year until 100 percent of them have been assessed. Changes and additions will be recommended as needed and documented in the SWMP. The review process will be the same as the review for new flood control structures.

#### ***4.2.6.9 Retrofit Program***

The City will review its list of owned and operated facilities every five years and Identify any that are negatively impacting water quality. If any are found to be negatively impacting water quality these sites will be ranked with respect to:

- Proximity to water body;

- Current assessment of waterbody with the goal to improve impaired waterbodies and protect unimpaired waterbodies;
- Hydrologic conditions of the receiving waterbody;
- Proximity to sensitive ecosystem or protected area; and
- Any sites that could be further enhanced by retrofitting storm water controls

Any City owned or operated site found to be negatively impacting water quality will be retrofitted to eliminate negative impacts. This retrofit will emphasize controls that infiltrate, have evapotranspiration, or harvest and use storm water discharges.

**4.2.6.10 Staff Training**

As part of its mandatory annual training and educational process, the City will train its staff involved with primary construction, operation, or maintenance job functions that are likely to impact storm water quality. Training shall meet the requirements of Section 4.2.6.9 of the Permit. Records of training shall be kept including dates, activities or course descriptions, and names and positions of staff in attendance.

**4.2.6.10 Control Measure #6 Summary**

The following Table 6 shows a summary of Best Management Practices (BMP’s) for Control Measure #6

**Table 6 - Control Measure #6 Summary**

<b>Best Management Practice (BMP)</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Latest Action (Updated Yearly)</b>
<b>Inventory</b>	Review and Update	Annually	Reviewed and updated 2021
<b>Assessment</b>	Review and Update	Annually	Reviewed and updated 2021
<b>High Priority Designation</b>	Review and Update	Annually	Reviewed and Updated 2021
<b>Develop Facility Specific SOP’s</b>	Review and Update SOP’s	Annually	Reviewed 2021

<b>Floor Drain Inventory</b>	Develop Inventory Update Inventory	Feb 2011 Annually	Reviewed 2021 Updated 2021
<b>Storm Drain Inventory and Map</b>	Develop Inventory Update Inventory	Feb 2011 Annually	Reviewed and updated 2021
<b>Inspections</b>	Perform and Document Required Inspections	Weekly and Quarterly	Performed 2021
<b>Flood Management Control Structures</b>	Review Process for New Facilities Evaluate Existing Facilities	Annual Update 20 % a year for five years, as needed after	Reviewed 2021 Evaluated 2021
<b>City Staff Education</b>	Yearly Training	Annually	Provided 2021

**4.2.6. Modifications to Previous Plan**

- Reordered section to match permit
- Updated table
- Reduced inspection schedule to match updated permit
- Updated retrofit program to match permit

**4.3 SHARING RESPONSIBILITY**

Utah County Storm Water Coalition is not considered a co-permittee with Pleasant Grove City but does provide some Public Education and Outreach efforts. The Coalitions efforts are identified in Section 4.2.1 of this plan.

The City will report and document the efforts of the Coalition. In the event the Coalition fails to implement the control measure it will become the City’s responsibility to do so or modify the control measure appropriately.

## **4.4 REVIEWING AND UPDATING STORM WATER MANAGEMENT PROGRAMS**

### **4.4.1 Storm Water Management Program Review**

The City will review its SWMP annually in conjunction with its yearly reporting.

### **4.4.2 Storm Water Management Program Update**

The City will update its SWMP as needed according to the requirements of part 4.4.2 of the Permit.

## **5.0 NARRATIVE STANDARD, MONITORING, RECORDKEEPING AND REPORTING**

### **5.1 NARRATIVE STANDARD**

The following narrative standard is utilized in the City's storm water ordinance. A copy of the ordinance is included in Appendix C.

“It shall be unlawful, and a violation of this Permit, for the Permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or conditions which produce undesirable aquatic life or which produces objectionable tastes in edible aquatic organisms; or concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures”

### **5.2 ANALYTICAL MONITORING**

Analytical monitoring is not required for the City except under the following circumstances.

#### **5.2.1 Compliance with TDML's**

The City discharges storm water to tributaries of Utah Lake which is listed as an impaired water body with respect to Total Phosphate and Total Dissolved Solids. No Total Maximum Daily Load (TDML) has been developed by the Division and approved by EPA for Utah Lake. TDML water quality studies are listed as “in-progress”. Once a TDML is established for Utah Lake, the City's SWMP will be updated to reflect the listing per permit requirements.

#### **5.2.2 Illicit Discharge Detection**

The City will utilize analytical monitoring as outlined in parts 4.2.3.4, 4.2.3.5, and 4.2.3.5.1 of this plan for illicit discharge detection.

#### **5.2.3 Elective analytical monitoring**

In the event the City elects or is required in the future to conduct analytical monitoring as part of this plan, the City will comply with part 6.18 of this plan.



### **5.3 NON-ANALYTICAL MONITORING**

Non-analytical monitoring is included in this SWMP as required in part 4.2.3.3.2 of the Permit.

### **5.4 RECORD KEEPING**

The City will keep all supplementary documents current and up to date according to part 5.4 of the Permit. Documentation will be maintained for a period of five years unless that period is changed by the Utah Division of Water Quality.

### **5.5 REPORTING**

The City will submit an annual report to the Division according to part 5.5 of the Permit.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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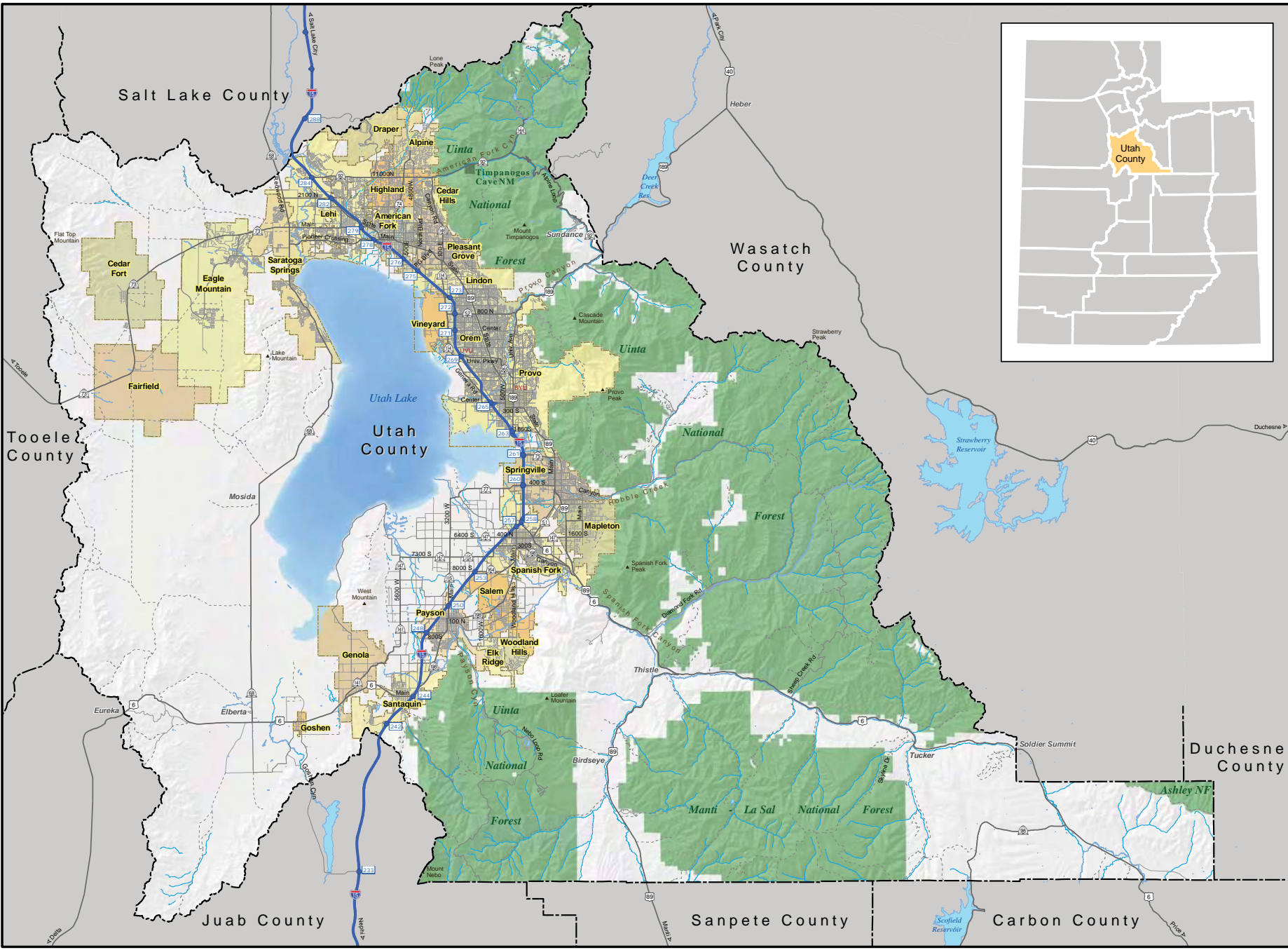
APPENDIX A – LOCATION MAP



# Utah County

State of Utah



- ~ County Boundary
- ~ I-15
- ~ US Highway/State Route
- ~ Major Road
- ~ Paved Road
- ~ Dirt Road
- ~ Gravel Road
- City Boundaries
- Waterbody
- Reservoir
- Major River
- River
- National Park Service
- National Forest



1:348,480  
 1 inch = 5.5 miles

Utah County Public Works  
 Mapping Division  
 2855 South State Street  
 Provo, UT 84606  
 (801) 851-8626

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 Map created by Curtis Wursten

# Pleasant Grove

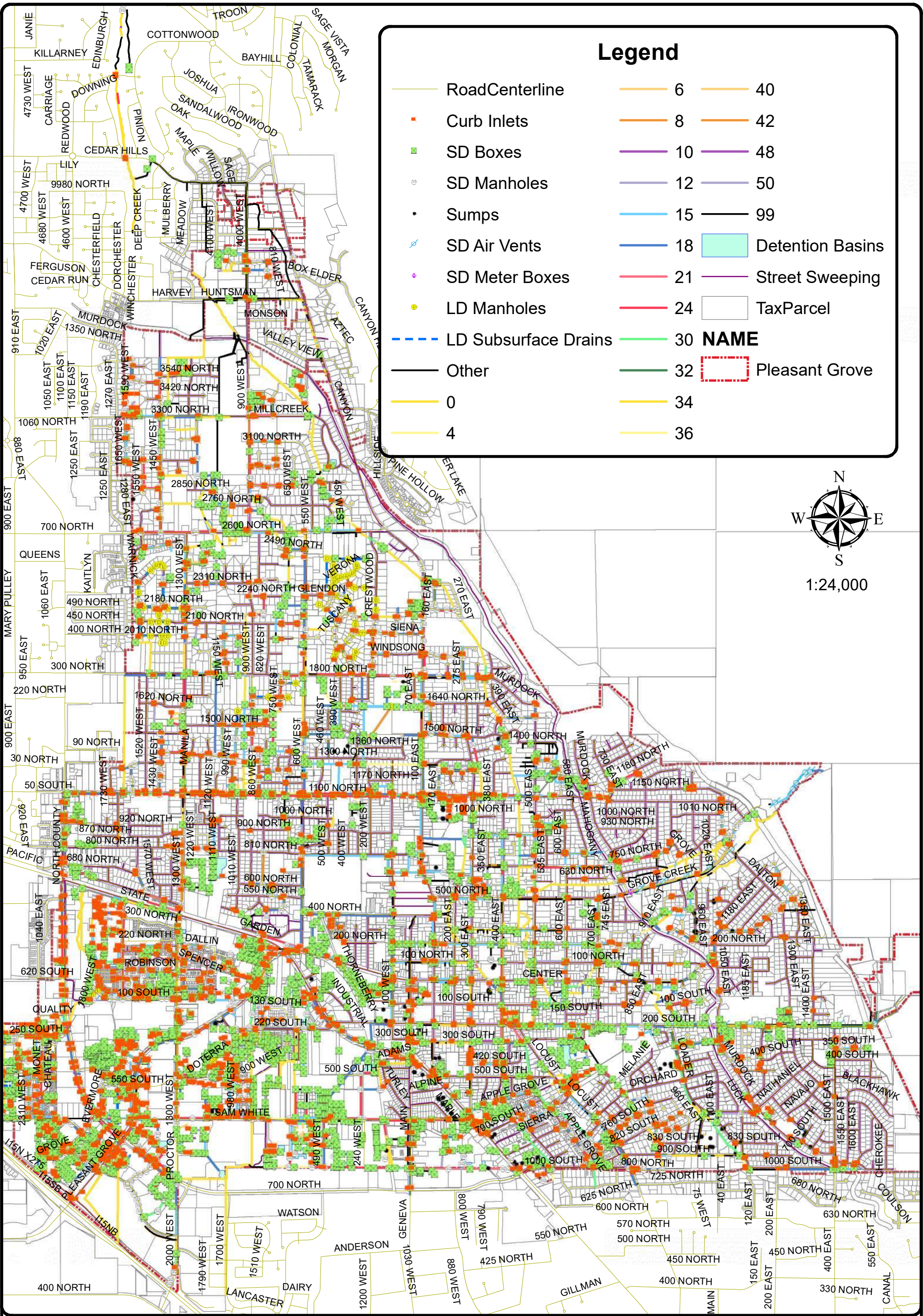


Utah's City of Trees

## Storm Water Management Plan

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**APPENDIX B – STORM WATER SYSTEM MAPS AND INVENTORIES**

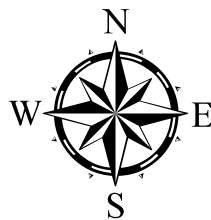


**HORROCKS**  
ENGINEERS

2162 West Grove Parkway  
Pleasant Grove, Utah 84062

# PLEASANT GROVE CITY

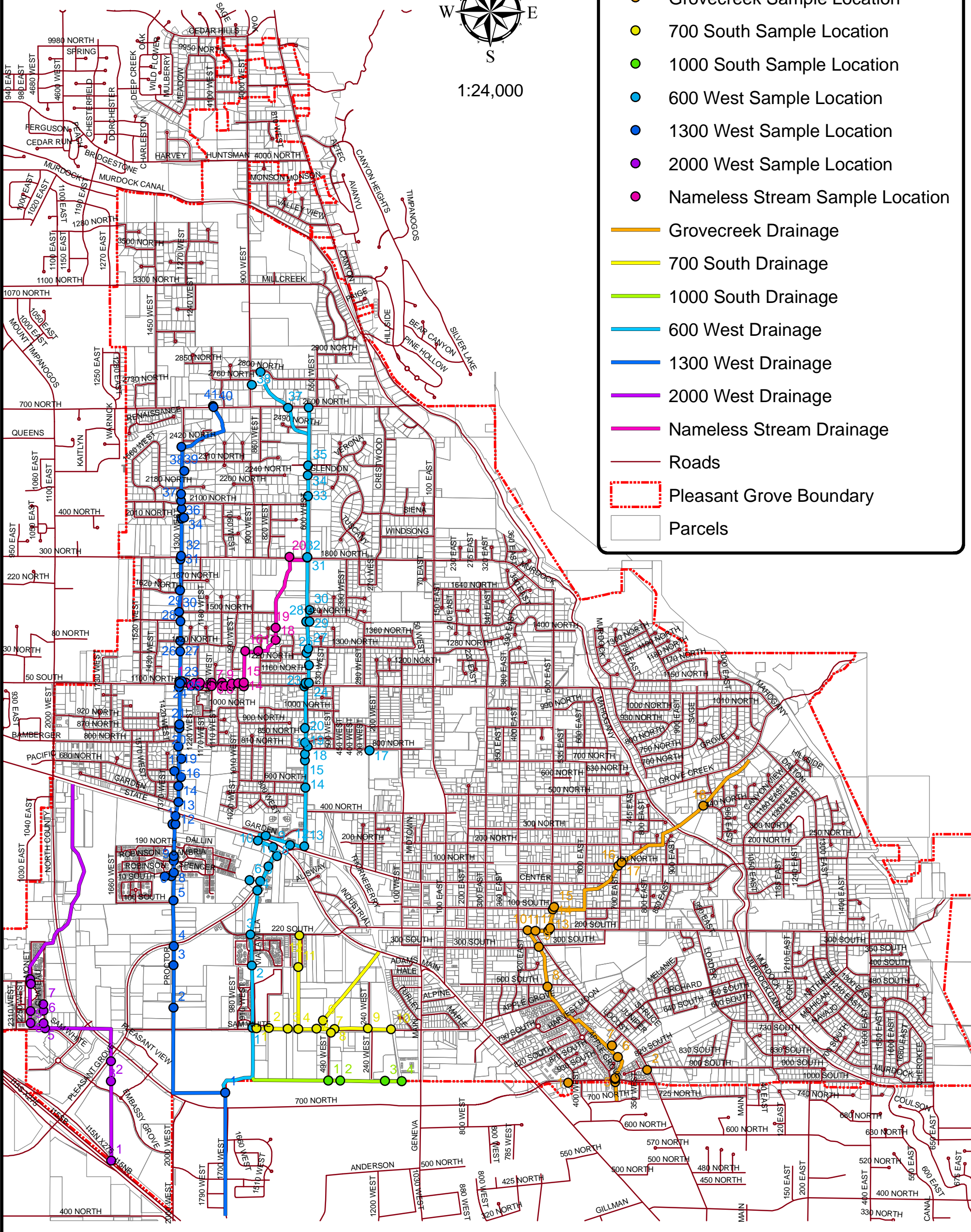
Figure B-1 Storm Water System Map



1:24,000

### Legend

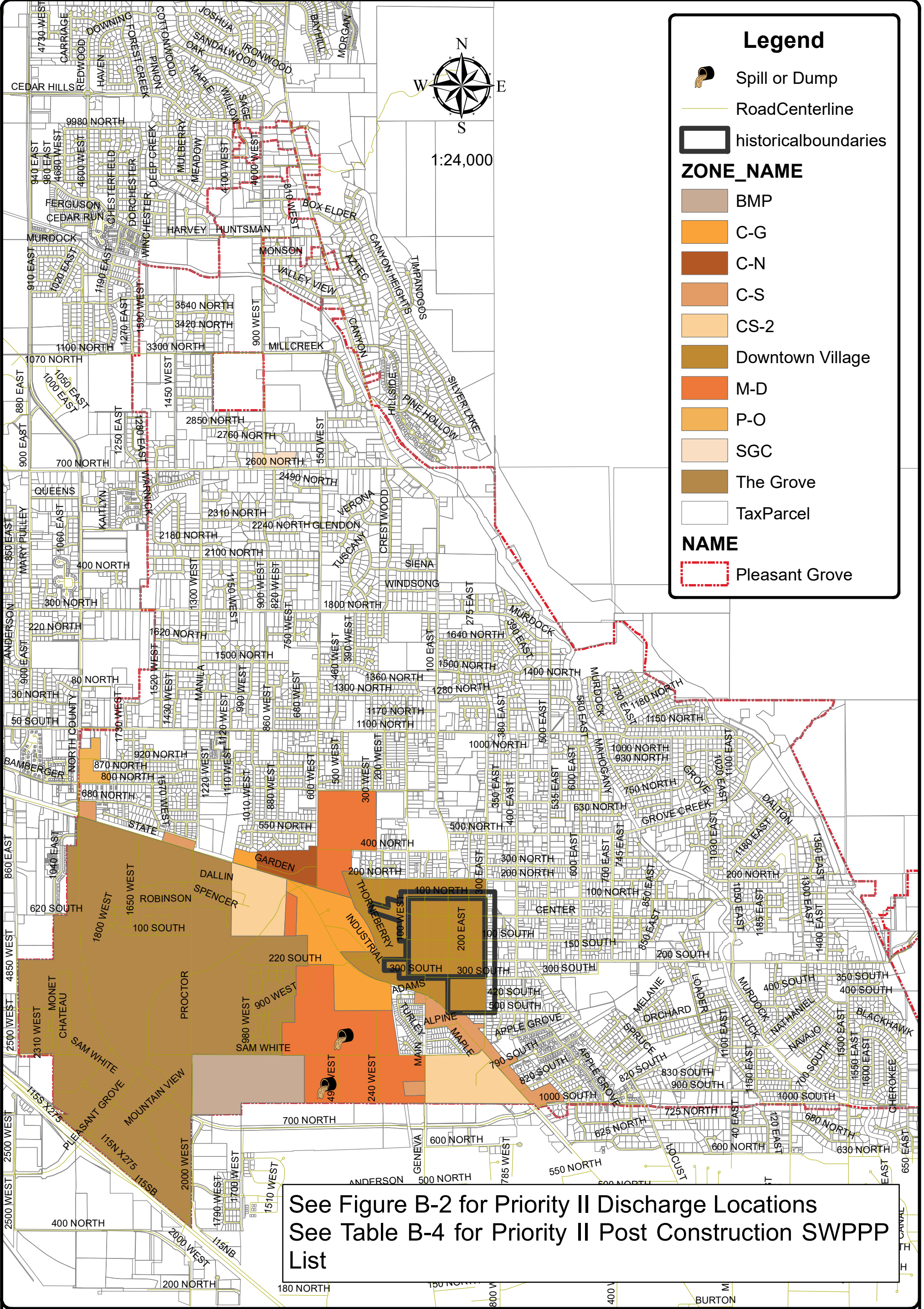
- Grovecreek Sample Location
- 700 South Sample Location
- 1000 South Sample Location
- 600 West Sample Location
- 1300 West Sample Location
- 2000 West Sample Location
- Nameless Stream Sample Location
- Grovecreek Drainage
- 700 South Drainage
- 1000 South Drainage
- 600 West Drainage
- 1300 West Drainage
- 2000 West Drainage
- Nameless Stream Drainage
- Roads
- Pleasant Grove Boundary
- Parcels



2162 West Grove Parkway  
Pleasant Grove, Utah 84062

## PLEASANT GROVE CITY

Figure B-2 IDDE Sample Location Plan



### Legend

- Spill or Dump
- Road Centerline
- historical boundaries

### ZONE\_NAME

- BMP
- C-G
- C-N
- C-S
- CS-2
- Downtown Village
- M-D
- P-O
- SGC
- The Grove
- TaxParcel

### NAME

- Pleasant Grove

**HORROCKS**  
 ENGINEERS

2162 West Grove Parkway  
 Pleasant Grove, Utah 84062

**PLEASANT GROVE CITY**

Figure B-3 Priority Areas Map

**Table B-4 IDDE Priority Areas List**

Priority I Areas			
ID	ADDRESS	DESCRIPTION	Year
1	700 South	Brundage Hydraulic Oil leakage	2014
2	700 South	Allied Waste Hydraulic Oil leakage	2014

Priority II Areas		
ID	ADDRESS	DESCRIPTION
1	Historical Overlay Area of Pleasant Grove	Older Infrastructure
2	Sanitary Sewer Overflows	None Presently
3	Commercial/Industrial/Mixed Use Areas	See Figure B-3
4	Long Term Storm Water Management Plan Holders	<b>See Below</b>

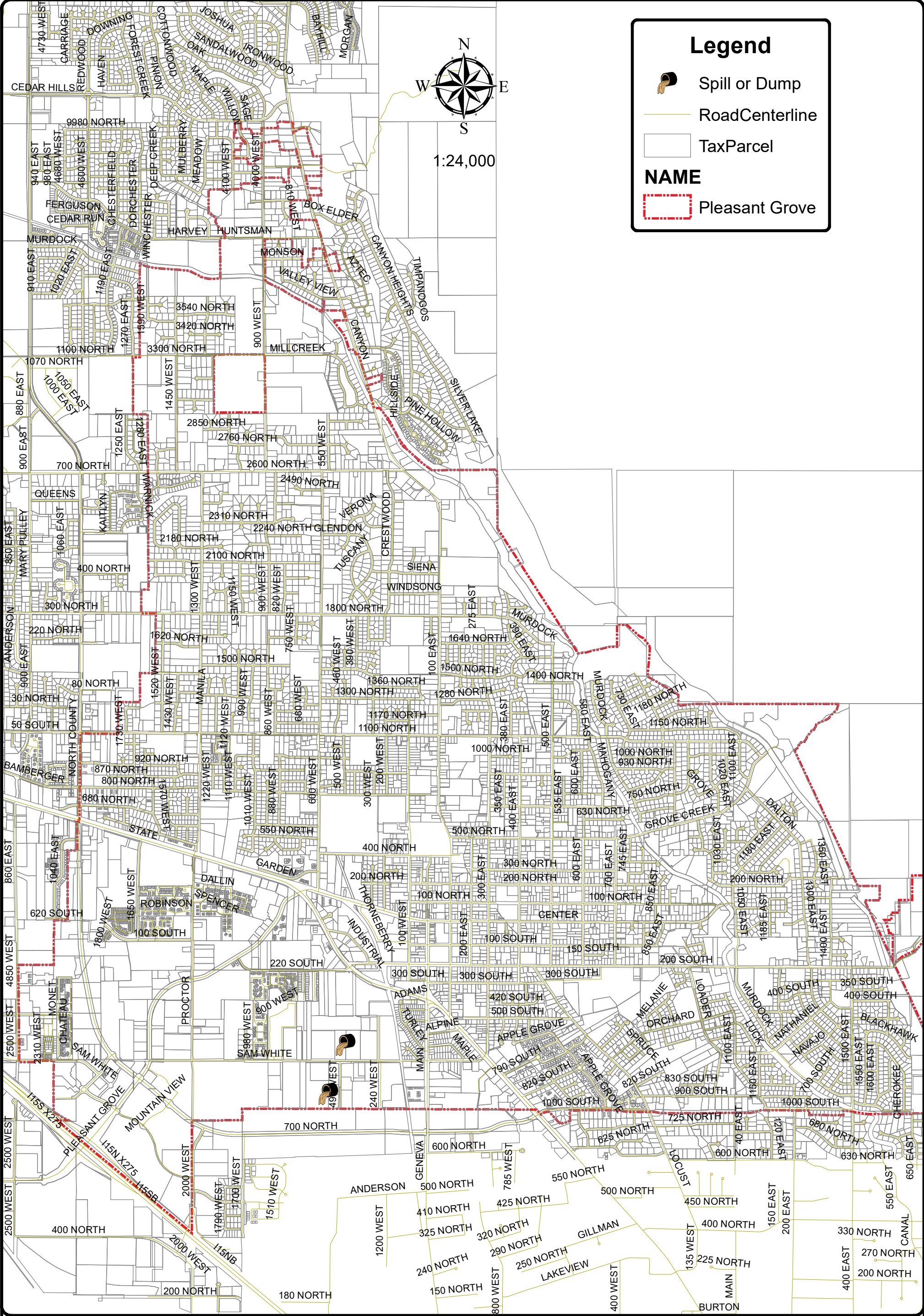
**Long Term Storm Water Management Inventory**

Perm	Development	Location	Operator (Name)	Contact #	Current SWPPP
6109	Thornberry	201 W. Center	Pentaland	301-2885	265-1155
6183	Centennial Square	238 W. St. #2		785-7190	
6216	McDonalds	700 S. State		303-779-0444	
6206	D&C Development	655 W. 220 S.	Office Warehouse	785-9866	
6241	City Side Office Park	457/459 E. 1000 S.	Condo	785-8025	
6257	Lindstrom	402 S. 100 E.	Business	785-3007	
6262	Dallin Aldridge	685 W. State	Comm.	785-1814	
6264	Village Square	376 E. State	Comm.	785-1814	
6286	Centennial Square	238 E. State		785-8025	
6297	Utaz Development	872/886 N. 2000 W.		377-6286	
6300	Sierra Cove Tri-Plex	526/518/514 E. Sierra Ln.		756-2682	
6306	Dr. Greg Kofferd (Alpine Ped.)	920 N. 2000 W.		377-6286	
6336	Village Square	376 E. State	Doug Nielson	376-6776	
6617	Jim Davis	732/734 W. 1000 N.	Tri-Plex	785-6265	
6809	P.G. Senior Center	242 W. 200 S.		361-1733	
6836	D&C Development	671 W. 220 S.		756-3802	
6855	Continerta Pipe	430 N. 600 W.		785-6922	
6911	U.S. Bureau of Reclamation	315 W. 1100 N.		372-9407	
6940	Dan Deans	454 W. State			
7011	Pebblecreek	462/464/456/458 E. 1000 S.		785-8025	
7173	Amsource	881 W./981 W. State		994-7000	
7319	PG Town Center Condo 2 plex	139 S. PG Blvd.	Green Grove Apt.	226-0080	
7325	Provo River Water Users	1100 N.		222-0710	
7365	Mountainland Head Start	350 W. State		375-7981	
7399	Car Wash	125 W. Center	Terry Stone	541-1031	
7548	Pleasant Springs	884 W. 700 S.		269-0700	
7630	Pemberley at Robinson Grove	1394 W. 110 N.	8 Plex (GCD)	434-8290	
7700	Garden Village 5 plex	1852 Thru 1832 Garden Drive	Wade Hanks		
7751	Gateway View Townhomes	149 N. Proctor Ln		566-1505	
7802	Dr. Edwards - Vet.	852 S. State		360-4202	
7833	Wieneischitzel	152 S. PG Blvd.		489-6408	
8000	Capelli Hair	200 E. State	No Permit		
8086	Gateway Village	655 S. 950 W.		492-0002	
8137	PG Town Center	985 W. State		994-7000	
8219	Allstar Auto	656 N. 2000 W.			
8304	Belle Monet	684 S. 2150 W.		465-8700	
8368	Dana Point	595 S. PG Blvd.		280-2184	
8428	Cambria	1286 W. 110 N.		227-0530	
	Cambria	1257 W. 50 N.			
8477	Country Cars Power Sports	25 W. State		360-2082	
8550	Business	140 S. Main	Ray Fox		
8604	PG Business Park	302 S. 710 W. 701 W. 220 S.		361-1733	
8734	PG Villas at Maplewood	264 S. 910 W.		836-1558	
8794	The Gables at PL. Grove	174 N. 1380 W., 152-158 N. 1380 W.		208-4000	
8925	Charter- One School	1582 W. 3300 N.		836-1558	
8931	Timp. Animal Hospital	815 S. Main		318-4933	
9050	Grove Business Park	822 S. 490 W., 513 W. 700 S.		568-9300	
9100	Rockwell - GCD	1462 W. 10 S.		434-8290	
9293	Maceys fuel Station	142 S. PG Blvd.		978-8242	
9325	PG Towncenter Car Wash	175 W. PG Blvd.		694-2697	
338	Mayfiel	260 S. 2500 W.		486-2530	
392	Grove Creek Center	2152 W. Grove Parkway		310-6552	
402	University of Phoenix	2174 W. Grove Parkway		480-822-1773	
514	Knesington	852 S. Main, 848 S. Main		420-5028	
519	Westgrove Plaza	2434 W. 700 S.		763-9901	
741	Discovery Grove	1955 W. Grove Parkway		836-8497	
748	Burbs	643 W. 700 S.		750-3848	
08-04	All American Development	200 S. State		787-7902	
09-17	Majestic Meadows	637 W. State		216-4660	
10-08	Northwest Pipe Co.	430 N. 600 W.		566-7906	
11-07	Grove Point	1975 W. State		361-7207	
	LDS Churches				
6349		455 E. 200 S.		255-7700	
6548		1028 W. 1000 N.			
6681		475 N. 700 E.		763-4543	
6712	J.H. Seminary	647 N. 300 E.		254-2000	
		942 N. 500 E.			
6885		828 S. Locust Ave.			
6919		105 W. 1800 N.		763-4520	
6963		825 S. Loader Ave.		763-4520	
7090		1320 W. 3540 N.			
7702		2195 N. 100 E.			
		800 N. 100 W.			
8182		303 S. Murdock			
8456		1136 W. 700 S.			
9135		56 S. 1300 W.		763-4543	
9144		332 E. 500 S.		763-4543	
9160		1548 N. 900 W.		509-0757	







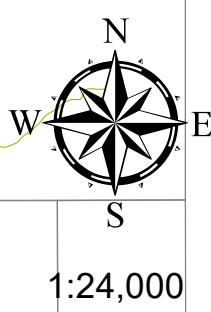
9221		3396 N. 900 W.		763-4520		
745		905 N. 500 W.		763-4520		
42		2433 W. 450 S.				
	Work Sheets					
		1998				
6046	Knight West					
6070	Village Square Comm. Addit.					
6094	Knight West Comm. Addit.					
6123	William Parker Med. Build					
6109	Thornberry Elderly house					
6152	Pentalo Const. Carports					
6183	Knight West Cent. Sq. #2					
6206	D&C Development Office Warehouse					
6216	McDonalds - 6379					
6232	Hal Ruston Computere Software					
6236	All American Elderly home					
6241	Knight West City Side Condo - 7133					
6257	JP Prop Jeff Lindstrom Comm					
6262	Dallan Aldridge Comm					
6264	General Nutrition Comm. Village Sq.					
6279	Village Sq./Blockbusters 6383 -6691					
6286	Knight West Comm. Finish					
6290	Lee's Café					
6297	Utaz Dev. Comm. 6415					
6300	Shane Morris Tri-Plex	2000				
6647	Phoenix Homes Comm. Remodel					
6681	LDS Church Remodel					
6712	HJH Seminary					
6716	LDS Church					
6731	John Pope Comm. Addit.					
6794	Nish Zundel (Proving Grounds) Int. Finish					
6802	Utaz Comm. Finish 5926					
6809	PG Senior Center					
6828	Warburton 6880					
6836	D&C Development					
6846	Magnum Mang Comm Remodel					
6853	UnCamp Credit Union					
6854	Smiths Gas Station					
6855	Continental Pipe					
6875	Knight West Unit 8-9 Comm					
6879	Steve Pterson Comm Remodel					
6885	LDS Church	2001				
6897	Joel Ivie Comm					
6911	US Bureau of Reclamation					
6913	Enrique Escobebo					
7382	Amsource Int finish 7401-02-03-04-05-06					
7399	Terry Stone Car Wash					
7417	Amsource Comm					
7504	The Marble Company Int. finish					
7542	Verl Bills Int. Finish - Quiznos					
7548	Western States Lodging Apartments	7549-7560				
		2003				
7618	Gary Devincent Glass Hospital Int finish					
7630	Mike Stewart 8 Plex GCD					
7631	Mike Steart 4 Plex 7632 - 33					
7652	LDS Church Remodel					
7656	Cobble Stone Int finish					
7700	Wade Hanks Multi family					
7702	LDS Church					
7751	Gateway View Townhomes					
7760	Alpine Pediatrics					
7772	Knight West Comm					
7802	Dr. Edwards - Vet.					
7817	Gateway View Townhomes Multi family	7817-7829				
7833	Wieneischtzel					
		2005				
8541	Green Groe Apartments	8541-8544-8560-68				
8550	Ray Fox Comm					
8584	Alison Chintz					
8594	Cambria Dev 3 plex					
8604	Dana Fairbanks Comm					
8631	Trophy Homes Multi Family	8631-8634				
8656	Sundance	8663-8665				
8704	Cambria Multi Fmily					
8734	Villas At Maplewood Multi Family	8734-8736			Distinctive Dev	
8749	PG Business Park					
8794	Castlewood Multi Family	89=794-8809				
8900	Brad Byland					
8925	Charter- One School					
8931	Timp. Animal Hospital	Darrel Barry				
		2006				
9050	Grove Business Park					
9062	Bellmonet Kriser Homes			9088		
9100	GCD rockwell			9108		
9135	LDS Church					
9137	City Side					
470	Spanky's Express comm Fongs					
495	Spinal Rehab comm					
514	New Century Kensington					
519	West Grove Plaza Comm	2008				
558	Verizon Wireless comm					
589	Precast Concrete comm					
688	DMB Grove Creek Center					
741	Discovery Office					

745	LDS Church					
748	Burbs					
		2009				
42	LDS Church					
48	All American Development					
114	Lincoln Acadamy					
171	Triple Focus Shell 170					



**Legend**

-  Spill or Dump
-  Road Centerline
-  Tax Parcel
- NAME**
-  Pleasant Grove



**HORROCKS**  
ENGINEERS

2162 West Grove Parkway  
Pleasant Grove, Utah 84062

**PLEASANT GROVE CITY**

**Figure B-5 IDDE Historical Spill and Dumping Locations**



## B-7 City Building Drain Inventory

Location	Address	#Drains	Notes
Pipe Plant Property	600 East, 400 North to 800 North	2 1 2	Old Home on 400 N and 600 W drain to sewer Changing Room Building drains to sewer RR drains to sewer
Veteran's Memorial Pool	Veteran's Memorial Park	2 1 11	Storage Room drain to sewer Pump Room drains to sewer Men's RR drains to sewer
Veteran's Memorial Pool	Vinking way and locust	13 5 1 2	Women's RR drains to sewer Concessions drains to sewer First Aid drains to sewer Life Guard Room drains to sewer
Home on 600 West 1775 North	600 West 1775 West	1	Drain to sewer
Public Safety Building	30 East 100 South	6 8 8	General floor drains to sewer Women's RR drains to sewer Women's RR drains to sewer
Fire Department	30 East 200 South	8 3 7 7	Bay drains to sewer General floor drains to sewer Women's RR drains to sewer Women's RR drains to sewer
downtown park restrooms	33 east 100 south	1 1	Men's RR women's RR
historic city hall	107 south 100 east	0	none in this old building
lions/sportsmen building	600 east center	1	In the basement of the building It drains into the sewer
pioneer museum building	73 south 100 east	0	none in this old building
City Hall	70 south 100 east	2 1 2 1	Up stairs RR @ the p.d.men and women's Holding area @ the p.d. Downstairs RR@ the p.d. drains to sewer Sally Port @ the p.d. drains to sewer
library building	70 south 100 east	1 2	downstairs in the kitchen downstairs in the RR
manila creek park R.R. building	3300 north 900 weat	1 1 1	Men's RR Women's RR Utility room
Manila park R.R. North	100 east 300 west	2	in the RR to the sewer
Manila Park R.R. South	100 east 300 west	2	in the RR to the sewer
Manila Park Scor Tower R.R.	100 east 300 west	1 1	Men's RR women's RR drains to the sewer
Mahogany ridge park R.R.	650 west	1 1	Men's RR women's RR drains to the sewer
Monson Well Buildings	900 east 200 north	2	One in each building,Drains into ditch.

Anderson Park well building	approx. 950 east	1	in building ,Drains into ditch.
Andersom Park R.R.	approx. 950 east	2	In the restrooms Men's and women's
Battle Creek park R.R.	850 east 200 south	2	In the restrooms Men's and women's
Battle Creek well house		1	Drain is in building,drains to the S.W
Battle Creek well house P.I.	1481 east 200 south	1	Drain is in building,drains to the S.W.
Manila tank park R.R.	350 south 1500 east	2	Men's and Women's RR
Gibson Well house building	337 south loader	1	Drain is in building, drains into the open ditch
Brimley Well house building	1062 east Nathaniel drive	1	Drains into ditch on the south side.
Grove Creek Well House building	P.I. filter station 500 North 1150 east	1	Drains into ditch on the south side.
Grove Creek Well House building	drinking water 500 North 1150	1	Drains into ditch on the south side.
Rodeo Grounds R.R	North and South	3	Drains to the sewer R.R. shower
Rodeo Grounds R.R	east building	1	Drains to the sewer R.R.
Shannon Fields R.R. sco. Tower	Just of 220 south	2 1	Men's and Women's RR drains to sewer Storage Room Drains to the sewer
Public Work building	323 West 700 South	2	Men's and women's R.R. drains to sewer
Cemetary building R.R.	550 north 100 west	1 3	Man's and Womem's R.R. drains to sewer Floor drains in shop drains into sump.
New Community center (rec)	547 north locust	14 2 2 1 2	Men's and women's R.R. drains to sewer Family R.R.s drains to sewer Preschool R.R.s men's and women's Kitchen on the north end drains to sewer Small bathroom by front desk to sewer Wash room drains to sewer
Veterans Memorial Park R.R.	399 South Locust	2	Men's and women's R.R. drains to sewer

B-8 Storm Drain Inventory on City Owned Property

Included in B-1

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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APPENDIX C – ORDINANCES



# Chapter 6

## STORM DRAINAGE

### Ordinance No. 2021-35

**AN ORDINANCE AMENDING CITY CODE TITLE 6 CHAPTER; “STORM DRAINAGE” ESTABLISHING OBLIGATIONS OF PRIVATE PROPERTY OWNERS TO MANAGE THE STORM WATER DRAINAGE ON THEIR PROPERTY; PROVIDING ENFORCEMENT POLICIES AND OTHER TECHNICAL ADDITIONS IN ORDER TO MEET STATE STORM WATER DISCHARGE REQUIREMENTS AND PROVIDING AN EFFECTIVE DATE. (CITY WIDE) (PLEASANT GROVE CITY APPLICANT)**

**WHEREAS**, The City is authorized by Utah Code § 10-8-84 to “pass all ordinances and rules, and make all regulations . . . as are necessary and proper to provide for the safety and preserve the health, and promote the prosperity, improve the morals, peace and good order, comfort, and convenience of the city and its inhabitants. . .”; and

**WHEREAS**, the purpose of this ordinance is to promote the public health, safety, and general welfare of the citizens of Pleasant Grove; and

**WHEREAS**, City has an existing storm drainage system that consists of a network of manmade and natural channels, structures, and conduits that collect and convey storm water runoff; and

**WHEREAS**, Land development alters the hydrologic response of watersheds by converting natural ground to impervious surfaces, resulting in increased storm water runoff rates and volumes, increased potential for flooding, increased stream and drainage channel erosion, and increased sediment transport and deposition; and

**WHEREAS**, Storm water runoff produced by land development activities places increased demands on the City’s storm drainage system; and

**WHEREAS**, The Environmental Protection Agency (EPA) and the Utah State Department of Environmental Quality (DEQ) have increased storm water regulations as part of the Phase II of the National Pollutant Discharge Elimination System (NPDES) and the Utah Pollutant Discharge Elimination System (UPDES); and

**WHEREAS**, City is mandated to be in compliance with these standards; and

**WHEREAS**, after consideration of all the relevant factors, the Pleasant Grove City Council finds and determines that it is in the best interest of the health, safety and general

welfare of its current and future residents to adopt this ordinance in order to provide adequate regulation of storm water flows within the City; and

**WHEREAS**, the City Council held a public meeting on December 7, 2021 to consider these ordinance changes; and

**WHEREAS**, at the conclusion of the meeting, the council adopted and approved the proposed ordinance amendments.

**NOW, THEREFORE, BE IT ORDAINED**, by the City Council of Pleasant Grove City, Utah County, Utah that Title 8 Chapter 6 of the Pleasant Grove Municipal Code be amended as follows:

**CHAPTER 6  
STORM DRAINAGE<sup>1</sup>**

**SECTION:**

**8-6-1: Findings; Storm Drainage Master Plan Adopted**

**8-6-2: Definitions**

**8-6-3: Obstructions**

**8-6-4: Dumping Or Pumping**

**8-6-5: Conveyance And Discharge Of Stormwater**

**8-6-6: Piping Of Existing Drainage/Irrigation Facilities**

**8-6-7: Penalty**

**Notes**

**1** 1. See also subsection 11-7-4D of this code for provisions regarding subdivision drainage plan.

**8-6-1: FINDINGS; STORM DRAINAGE MASTER PLAN ADOPTED:**

**The city council:**

**A.** Has found it necessary and determined that the public interest, convenience, health, welfare and safety requires that all water generated from, off and around individual construction, commercial, industrial, and public use developments and subdivisions be

confined and disposed of in a flood control storm drain system; and (Ord. 98-34, 12-15-1998)

**B. Has adopted as part of the city's general plan a storm drainage master plan as amended from time to time relating to the disposition of surface waters in a storm drainage system; and (Ord. 98-34, 12-15-1998; amd. Ord. 2004-16, 7-20-2004)**

**C. Has found that each area which is proposed to be subdivided, developed and/or built upon, does in fact generate additional runoff water which needs to be disposed of in a safe manner, avoiding damage and hazards to the inhabitants of the city; and**

**D. Has found it is necessary that certain improvements be constructed upon and/or in close proximity to subdivisions, commercial, industrial and public use developments, developments and individual construction in order to carry the surface runoff water to appropriate storage, disposition areas and other facilities identified in the storm drainage master plan; and**

**E. Has found that the costs of construction of the improvements must be borne by the subdivision and/or proposed developer and builder. (Ord. 98-34, 12-15-1998)**

#### **8-6-2: DEFINITIONS:**

**For the purpose of this chapter, the following terms, phrases, words and their derivations shall have the meanings given herein:**

**BEST MANAGEMENT PRACTICE (BMP):** is a schedule of activities, prohibition of practices, maintenance procedures, and other management practices to prevent or reduce storm water pollution. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

**CLEAN WATER ACT: IS THE** Clean Water Act of 1987, formerly referred to as the Federal Water Pollution Control Act.

**CATCH BASIN:** A basin that has a stormwater inlet to trap solids or debris.

**DEBRIS:** Any rock, dirt, sand, tree or other rubbish, litter, etc.

**DETENTION BASIN OR RETENTION BASIN:** A depression, or bermed area, designed with an inlet and outlet that regulates water flow and may allow debris to settle out of the water, and that is capable of detaining stormwater runoff until it can either percolate into the surrounding soil, or be discharged at an approved release rate into a channel, pipe, ditch, street or other conveyance, without causing damage downstream. The detention basin shall have a discharge into said facilities as set forth above, however, a retention basin must contain all generated volumes.

**DEVELOPED LAND:** shall be all property altered from a natural state by grading, paving, compaction, construction of structures, impervious surfaces, or drainage works so that storm water runoff from the property is changed in quantity, quality, or point of discharge from that which would occur in the natural condition, or so that provision of control and management of storm water runoff from other properties is necessary to prevent property damage and/or personal hazard during storm events.

**DISCHARGER:** is any person or entity who directly or indirectly discharges storm water from any property or who directly or indirectly discharges any substance into a storm drainage system.

**DRAIN INLET:** A point of entry into a sump, detention or retention basin, or stormwater system or conduit, or approved irrigation system.

**ILLICIT DISCHARGE:** is any discharge into a water body, drainage channel, or a public or private drainage system that is not composed entirely of storm water or discharges otherwise exempted.

**IMPERVIOUS SURFACE:** means any hard surface, other than an undisturbed natural surface, that prevents or retards the absorption of water into the soil, or that causes water to run off the surface at a rate or quantity greater than that of the natural surface. Common impervious surfaces include, but are not limited to, rooftops, sidewalks, walkways, patio areas, driveways, parking lots, and storage areas.

**LOW IMPACT DEVELOPMENT (LID):** Storm water control measures intended to capture, infiltrate, or treat initial runoff.

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES):** is a federal permitting program, as authorized by Section 402 of the Clean Water Act, to control water pollution by regulating point sources that discharge pollutants.

**POLLUTANT:** is any substance which has the potential to impair water quality including but not limited to the following: solid wastes, vehicle fluids, yard wastes, landscape materials, animal wastes, sediment, sewage, garbage, chemical wastes, biological wastes, soils, rocks, sand, or any other substance defined as a pollutant under the Clean Water Act.

**PRETREATMENT:** A structure, facility, or system that is designed to treat the flows in a stormwater conveyance system prior to discharge into downstream facilities, receiving waters, or into the soil. The facility reduces bulk pollutants by reducing sediment loads, removing trash, oils, grease and debris, and reducing Total Suspended Solids (TSS).

**PRIVATE DRAINAGE:** is all storm water that originates within the boundaries of private property, including, but not limited to, residential, commercial, industrial, or agricultural.

**It shall retain private classification up to the point where it is discharged to a public storm water facility.**

**STORM DRAIN:** A closed conduit for conducting stormwater that has been collected by inlets or other approved means.

**STORMWATER:** Precipitation such as rain, snow, hail or other naturally occurring waters, that are not present as groundwater. Once the water percolates into the soil, it is defined herein as groundwater. Stormwater runoff is water that is generated by stormwater over land. All other water is defined as being water that is naturally occurring, and is not stormwater.

**STORMWATER RUNOFF:** is the runoff and drainage of precipitation resulting from rainfall, snowfall, or snow/ice melt or other natural events or processes.

**SUMP:** A formalized structure underground, surrounded by drain rock, that acts as a detention basin to allow the slow release of water into the surrounding subsoil. Sumps usually receive stormwater runoff from paved areas such as streets, parking lots, building roofs, etc. (Ord. 98-34, 12-15-1998; amd. Ord. 2020-16, 7-21-2020; Ord. 2020-29, 12-15-2020)

**UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES):** is a State permitting program authorized by Section 402 of the Clean Water Act to control water pollution, and is comparable to the National Pollutant Discharge Elimination System (NPDES).

### **8-6-3: OBSTRUCTIONS:**

**A. It is unlawful for any person to obstruct or contribute to the obstruction of the flow of stormwater runoff or non-stormwater runoff into any sump, retention basin, stormwater channel or storm drain, curb and gutter, drain inlet, or other associated structural controls that convey stormwater and/or non-stormwater runoff.**

**B. It is unlawful for any person to cause any obstruction that inhibits the normal flow of stormwater and/or non-stormwater runoff in any curb and gutter, unless the obstruction is associated with a street and/or stormwater improvement project and is authorized by the city engineer or his appointee and granted with the issuance of a permit signed by the city engineer or his appointee.**

**C. It is unlawful for any person to cover over any drain inlet for any reason or purpose. (Ord. 98-34, 12-15-1998)**

### **8-6-4: DUMPING OR PUMPING:**

**A. It is unlawful for any person to dump or pump, or allow to be dumped or pumped, into any sump, detention or retention basin, storm drain, curb and gutter, drain inlet, or**

other storm or non-storm water structure that conveys stormwater and/or non-storm water, including, but not limited to: any type of debris, groundwater, petroleum product, chemical, paint, pesticide, herbicide, heavy metal, acid or base product, solid or liquid waste product, hazardous waste product, and/or human or animal waste.

B. The restrictions set forth in subsection A of this section shall not apply to the normal runoff of non-stormwater related to domestic home use, as long as the product in question is used in the manner prescribed by the manufacturer of the product; for example, lawn watering, washing cars, etc. (Ord. 2012-2, 1-17-2012)

#### **8-6-5: CONVEYANCE AND DISCHARGE OF STORMWATER:**

##### **A. Prohibited Discharges.**

1. **Illicit Discharges.** It is unlawful for any person to cause or allow the discharge into a water body or storm drainage system, either directly or indirectly, of any substance not comprised entirely of storm water or an exempted discharge as listed in Subsection (2) of this Section.
2. **Exempted Discharges.** The following non-storm water discharges shall be permissible; provided, that they do not result in a violation of water quality standards set forth by the State of Utah and/or Federal agencies:
  - (a) Discharges regulated under a valid Utah Pollutant Discharge Elimination System (UPDES) discharge permit; provided that the discharge complies with the terms of the permit.
  - (b) Discharges from water line flushing.
  - (c) Discharges from landscape or lawn watering.
  - (d) Uncontaminated ground water.
  - (e) Uncontaminated irrigation water.
  - (f) Discharges from natural riparian habitat or wetland flows.
  - (g) Discharges from air conditioning condensate.
  - (h) Discharges or flows from emergency management or firefighting activities.
  - (i) Discharges from foundation drains, footing drains or crawlspace or basement pumps; provided that the discharge is approved by the Public Works Director or their designee.
  - (j) Discharges resulting from municipal infrastructure management, including street wash water, storm drainage system jetting, hydrant flushing and/or testing, etc.
3. **Accidental Discharges.** Any person who accidentally discharges into a water body or storm drainage system shall immediately inform the Public Works Director or their designee of the discharge. If such information is given orally, a written report concerning the discharge is to be submitted by the discharger to the Public Works

**Director, or their designee, within ten (10) days of the discharge. The written report shall specify:**

- (a) The composition of the discharge and the cause thereof.**
- (b) The exact date, time and estimated volume of the discharge.**
- (c) All measures taken to clean up the accidental discharge.**
- (d) Proposed measures to be taken to prevent any recurrence.**
- (e) The name and contact information of the person making the report.**

**A properly reported accidental discharge shall be considered an affirmative defense to a civil infraction of this Title; however, it shall not be a defense to legal action brought to obtain an injunction, to recover costs, or to obtain other relief from any adversities resulting from the discharge. A discharge shall be considered properly reported only if the discharge complies with all requirements of this section.**

**B. Prohibited Storage and Littering.**

- 1. It is unlawful for any person to place garbage, refuse yard waste, pet waste, rocks, soil, mud, or any other tangible material/substance into any street, gutter, or component of the storm drainage system.**
- 2. Except as permitted by law and where adequate protection and containment is provided, it is unlawful for any person to store, stockpile, keep, or leave any pollutant or hazardous material, within a drainage-way, or in a manner that is likely to result in the discharge of material into the storm drainage system.**

**C. Inspection, Monitoring and Sampling.**

- 1. Under the direction of the Public Works Director or their designee, a properly identified City representative may inspect, monitor and/or obtain samples from storm water runoff facilities of any discharger to determine compliance with the requirements of this Title.**
- 2. Any discharger shall allow the City's representative to enter upon the premises of the discharger during regular business hours for the purpose of inspecting, monitoring and/or sampling storm water discharges.**
- 3. The discharger shall allow the City's representative to temporarily place on the discharger's property the equipment or devices necessary to perform proper inspections, monitoring and/or sampling of storm water discharges.**

**D. Reduction of Stormwater Flows:**

**1. Multi-Family, Commercial, and Industrial Development: The development for which the permit or approval is issued must design for and calculate the flows and volume, as provided in subsection [11-7-4D](#) of this code, that will be produced by a 10-year, 24-hour storm for detained flow, and a 25-year, 24-hour storm for retained flow. In addition, the**

maximum allowable discharge from the detention basin(s) for the entire project area or site shall not exceed 0.15 cfs per acre of gross area of development. The amount of storm water exiting the project cannot exceed the amount calculated above but may be further restricted by the capacity of existing storm drains or drainage facilities as determined by the City Engineer. Restrictions to the controlled rate of release will require that detention storage be provided. If no storm water collection system is available downstream with allowable capacity, retention of the 25-year storm must be provided. In any event that retention is the only available source of storm water management, in the determination of the city engineer, the soil must be capable of absorbing the entire volume of water within a three (3) day period of time, as determined by a percolation test that shall be performed on the site to be used for retention of the storm water. All other provisions of the sizing, improvement and use of retention or detention basins shall conform in all instances to the provisions of section [10-15-33](#) of this code. In addition, all provisions of the design of storm water systems or control for each development shall conform to the stormwater master plan. Such developments must also provide means of safely conveying the 100-year storm to available public roads and drainage facilities without undue flooding of buildings and adjacent property. If such facilities are not provided or feasible, as determined by the City Engineer, retention of the full 100-year event must be provided.

**2. Single-family residential:**

a. Single-family residential developments are not required to install onsite detention or retention facilities unless no storm water collection system with allowable capacity, or no regional detention basins are available downstream with sufficient unused capacity, or no such facilities are planned for in the storm drain master plan, as determined by the City Engineer. Detention or retention must be designed for the 10-year or 25-year storm volume as described in [8-6-5-A-1](#).

b. Developments must be designed to safely convey the 100-year event to public roads and drainage facilities without flooding buildings or creating additional undue flooding of neighboring properties, as determined by the City Engineer.

B. All developments for which the permit or approval is issued must provide means of conveying the 25-year storm from the site to public facilities. Any conveyance facilities connecting to city systems, or intended for dedication to the city, must be designed to convey the full 25-year storm event.

C. All facilities which are designed to infiltrate runoff into the soil must have means of pretreatment. The pretreatment must be designed to treat all flow up to the 2-year storm peak flow and volume and must retain the majority of trapped sediment and pollutants during bypass events. In a system that injects water directly into the soil, if special



circumstances exist on a development site, the City Engineer may specify a larger design event for pretreatment or require that other protective measures be installed.

**D. January 1, 2021, all submitted development applications for new or redeveloped developments with an area greater than 1 acre in size must address Low Impact Development storm drain design practices as outlined below. The Project Volume Retention Goal ( $V_{goal}$ ) must be calculated as described in the "Storm Water Technical Manual" in Appendix A of the "Public Works Standards Specifications and Drawings".**

**1. For developments in single family residential zones, the MS4 LID Residential Development Fee will be calculated based on the  $V_{goal}$  volume, in accordance with the current adopted fee schedule.**

**2. All other types of development must provide infiltration, evapotranspiration and bioretention facilities for the full  $V_{goal}$  volume in accordance with the requirements of the Storm Water Technical Manual. If conditions exist as outlined in the Storm Water Technical Manual that prevent such developments from infiltrating the full volume, a partial retention approach shall be utilized. Whatever volume of water cannot be infiltrated shall be treated using LID practices prior to discharging any storm water offsite.**

**3. The City Engineer may reject or require adjustments or modifications to any LID methods, standards, or guidelines proposed for use by the developer that are deemed by the City Engineer to not meet the requirements or intent of the city code or the city's Standard Specifications and Drawings, or that may be ineffective, or unproven, or create excessive or unaddressed maintenance concerns, or that may create a public nuisance.**

**E. In the instances where the plan describes major storm water conveyance channels that are intended to remain in an open, non-piped condition, conflicting provisions of this code, requiring that channels, ditches, and other storm or irrigation water conveyances be piped, shall be waived. (Ord. 98-34, 12-15-1998; amd. Ord. 2020-16, 7-21-2020; Ord. 2020-29, 12-15-2020)**

#### **8-6-6: PIPING OF EXISTING DRAINAGE/IRRIGATION FACILITIES:**

**Any open irrigation and/or drainage ditches which are located within or along the borders of any proposed development must be piped or otherwise covered as a condition of development approval, except as provided in section [8-6-5](#) of this chapter. The developer shall be responsible for the design and construction of the required improvements. In the event the ditch has been identified in the stormwater master plan as needing increased capacity, the city council may elect to have the city participate in the costs of piping such ditch. (Ord. 98-34, 12-15-1998; amd. Ord. 2020-29, 12-15-2020)**

#### **8-6-7: ENFORCEMENT, PENALTIES, AND ABATEMENT PENALTY:**

- 1. Enforcement Authority.** The Public Works Director, or their designee, shall have the authority to issue notices of violation, stop work orders and to impose civil penalties for any violation of this Title.
- 2. Notice of Violation.** Whenever the Public Works Director, or their designee finds that a person has violated any of the provisions of this Title, the Director or their designee may issue a written notice of violation. Such notice may include any or all of the following:
  - (a) Elimination of illicit connections or discharges;
  - (b) That the violating discharges, practices, or operations shall cease and desist;
  - (c) The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;
  - (d) Payment to cover remediation costs incurred by the City;
  - (e) The implementation of proper BMPs to prevent future occurrences.

Within ten (10) days of the date of the notice, the violator shall submit to the Public Works Director or their designee a plan for the satisfactory correction of the discharge or a request for an administrative hearing. The Public Works Director or their designee may skip the notice requirements set forth in this Section and immediately proceed with civil and/or criminal action against the violator if (1) the violator has committed the same violation in the past, or (2) the violation, in the opinion of the Director or their designee creates a serious risk to the public, the environment, or property, or (3) the Director or their designee deems the violation an emergency.

- 3. Stop Work Order.** Where there is work in progress that causes or constitutes a violation of any provision of this Title, the Public Works Director, or their designee is authorized to issue a stop work order to prevent further or continuing violations and/or adverse effect. All persons to whom the stop work order is directed, or who are involved, in any way, with the work described in the stop work order shall fully comply therewith. In situations which may be deemed a risk to the public health or safety, the Director or their designee may also undertake or cause to be undertaken any necessary or advisable protective measures to correct the violation and prevent further unauthorized discharge, the cost of which shall be the responsibility of the owner of the property upon which the work is being done and any person carrying out or participating in the work. Such costs shall be a lien upon the property, at the discretion of the City. In cases where the costs exceed available bond monies, the responsible party shall not be granted new permits by the City until the costs have been repaid to the City in full.

#### **8-6-8: PENALTY:**

**A. Civil Penalties: The violation of any of the provisions of this chapter shall be punished as follows:**

- 1. First day warning of violation without actual discharges to the City Storm Drain System is considered a Level I Violation or infraction and is subject to a zero (\$0) dollar fine and a Red Tag.**
- 2. Second day of violation after warning, without actual discharges to the City Storm Drain System is considered a Level I Violation or infraction and is subject to a \$100.00 fine.**
- 3. Third day of violation after warning, without actual discharges to the City Storm Drain System is considered a Level I Violation or infraction and is subject to a \$300.00 fine.**
- 4. If the violation is not corrected after the third day, it shall be elevated to a Level II Violation and follow the penalties as outline below for Level II Violations.**
- 5. First day of violation WITH illegal discharges to the City Storm Drain System is a Level II Violation or infraction subject to a \$500.00 fine.**
- 6. Second day of violation WITH illegal discharges to the City Storm Drain System is a Level II Violation or Class C misdemeanor and shall be punishable by a fine in a sum not to exceed seven hundred and fifty dollars (\$750.00), or by imprisonment for a period of not longer than ninety (90) days, or by both such fine and imprisonment.**
- 7. Each additional day is an additional Class C misdemeanor up to a maximum of seven (7) days.**
- 8. After seven (7) days it becomes a Level III Violation or a Class B misdemeanor and shall be punishable by a fine in a sum not to exceed one thousand dollars (\$1,000.00), or by imprisonment for a period not longer than six (6) months, or by both such fine and imprisonment.**
- 9. Each additional day is an additional Class B misdemeanor.**
- 10. Upon conviction of a violation of any provision of this Chapter, any license previously issued to the violator or for the subject property issued by the City may be revoked by the court or the governing body.**
- 11. If, as a result of the violation of any provision of this Chapter, the City or any other party suffers damages, fines, incurs investigative or clean-up costs, or is required to make repairs and/or replace any materials, the cost of investigations, fines, repair or replacement shall be borne by the party in violation, in addition to any criminal fines and/or penalties.**
- 12. Repeat offenders (3 or more Level I or greater violations within 24 months) or those with unpaid fines shall be ineligible for the issuance of any permit(s) for a period of one (1) year from the date of the last offense and all fines are paid.**
- 13. If there are three (3) violations at any level within 24 months, the next violation is automatically escalated by one level.**

**B. Administrative Hearing.**

A person or entity served a notice of violation of any of the provisions of this Title with civil penalties shall have the right to an administrative hearing. A request for such hearing shall be in writing and shall be filed, with the City Recorder or their designee within ten (10) days from the date of service of the Notice. Failure to request an administrative hearing shall constitute a waiver of the right to an administrative hearing and a waiver of the right to appeal. Administrative hearings shall adhere to the provisions of \_\_\_\_\_ of the Pleasant Grove Municipal Code.

**C. Violators of this Title may be subject to prosecution, fines, and penalties from the State of Utah and the United States EPA. Nothing in this Title shall be interpreted to relieve any person from an obligation to comply with applicable Federal, State, or local laws related to storm water discharge or drinking water protection.**

(Ord. 98-34, 12-15-1998; amd. 2003 Code; Ord. 2020-16, 7-21-2020; Ord. 2020-29, 12-15-2020)

**SECTION 2. SEVERABILITY.** The sections, paragraphs, sentences, clauses, and phrases of this Ordinance are severable. If any such section, paragraph, sentence, clause, or phrase shall be declared invalid or unconstitutional by the valid judgment or decree of a Court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any of the remaining sections, paragraphs, sentences, clauses or phrases of this Ordinance.

**SECTION 3. EFFECTIVE DATE.** This ordinance shall take effect immediately upon its passage and posting as provided by law.

**SECTION 4. APPROVED AND ADOPTED** by the City Council of Pleasant Grove City, Utah County, Utah, this \_\_\_\_ day of December 2021.

\_\_\_\_\_  
Guy L. Fugal, Mayor

**ATTEST:**

\_\_\_\_\_  
Kathy T. Kresser, MMC  
City Recorder

# **Chapter 8**

## **SENSITIVE LANDS**

### **11-8-1: LEGISLATIVE INTENT:**

A. With the enactment of this chapter, it is the intent of the city council:

1. To place the liability and expense of evaluating the condition of potentially unstable land, and determining restrictions which should be placed on its development, upon geologists or engineers employed by the landowner;
2. To restrict the development of land to those uses which do not present unreasonable risks to persons or property because of geologic hazards; and
3. To prevent fraud in land sales relating to the geologic condition of real property.

B. With the enactment of this chapter, it is the intent of the city council to authorize a governmental function of regulation within the meaning of Utah Code Annotated sections 63-30-3 and 63-30-10(1), (3) and (4). (Ord. 2000-23, 7-18-2000)

### **11-8-2: GENERAL PROVISIONS:**

The provisions of this chapter are intended to minimize floods, erosion and other environmental hazards; to protect the natural scenic character of foothill areas, and other areas not suitable for development, and to ensure the efficient expenditure of public funds. To ensure that the improvement of proposed sensitive lands areas shall reflect the best interests of the city, all grading or other improvement of any land, including, but not limited to, land in approved subdivisions or other development plans, shall conform to the development standards, guidelines and criteria of this chapter. The policies to be achieved by this chapter shall include, but not be limited to, the following: (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

- A. Minimize grading deviations from the natural contour of the land. Round off, in a natural looking manner, sharp angles at the tops and ends of cut and fill slopes. Avoid a "staircase" or "padding" effect.
- B. Require preservation of trees and other vegetation that stabilize steep hillsides, retain moisture, prevent erosion and enhance a natural scenic view. Where necessary, require additional landscaping to enhance the scenic and safety characteristics of the hillside.
- C. Require immediate planting of vegetation wherever appropriate to stabilize cut and fill slopes, to conceal the raw soil from view and to minimize erosion. (Ord. 2000-23, 7-18-2000)

- D. Preserve natural drainage channels. May require dedication of fifteen foot (15') wide drainage and access easement on both sides of channel for inspection and maintenance. (Ord. 2000-23, 7-18-2000; amd. 2003 Code; Ord. 2004-19, 8-17-2004)
- E. Encourage retention of natural landmarks, prominent natural features, wildlife habitation and open space.
- F. Preserve and enhance the visual and environmental quality by using natural vegetation and minimizing excavation and terracing.
- G. Protect the public from natural hazards of storm water runoff and erosion by requiring drainage facilities.
- H. Minimize the threat of fire damage by establishing fire protection measures. (Ord. 2000-23, 7-18-2000)
- I. Establish land use management that will encourage protection of natural elements while allowing a harmonious and satisfying residential environment. Establish multi-use trail system along drainage channels, watercourses and foothill areas. (Ord. 2000-23, 7-18-2000; amd. 2003 Code; Ord. 2004-19, 8-17-2004)
- J. Encourage a regard for the view of the foothills as well as view from the foothills. (Ord. 2000-23, 7-18-2000)

### **11-8-3: ACTIONS PROHIBITED:**

Notwithstanding any other provision of this title, it shall be unlawful to grade, fill or excavate any land in any manner which presents an unreasonable risk of erosion, flooding, landslide or any other unsafe condition. It also shall be unlawful to erect any structure which will not be reasonably safe for use as a human habitation because of:

- A. Shallow ground water (water close to the surface);
- B. Surface water;
- C. Expansive soils;
- D. Collapsible soils;
- E. Proximity to a potential landslide area;
- F. Proximity to a secondary fault;
- G. Proximity to an active landslide;
- H. Proximity to a primary Wasatch fault zone;

I. Steep slopes;

J. Any other unsafe condition. (Ord. 2000-23, 7-18-2000)

#### **11-8-4: PROCEDURE TO DEVELOP REAL PROPERTY:**

A. It shall be unlawful to construct any road to be dedicated to the public without doing the following:

1. Obtain the acknowledgment of the city engineer that a geotechnical report (a "geotechnical report" is described in section [11-8-7](#) of this chapter) required by this chapter, has been received and meets the requirements of section [11-8-7](#) of this chapter. (The giving of this acknowledgment by the city engineer shall not be an approval of or acquiescence to the content or conclusions of the geotechnical report. A geotechnical report shall be considered part of the public record and may be copied by any person.)
2. Except as provided in section [11-8-10](#) of this chapter, by grading, filling or excavating land or erecting structures only as described in the geotechnical report that has been acknowledged by the city engineer.
3. By executing and recording the restrictive covenant required by section [11-8-12](#) of this chapter. (This subsection does not apply if no geotechnical report is required.)

B. In addition to the provisions of this chapter, all grading, filling or excavation of land or erection of any structure shall comply with all other applicable provisions of these ordinances. (Ord. 2000-23, 7-18-2000)

C. Those parts of any proposal to construct improvements such as roads, sewer lines, water lines, trails or other improvements which are intended to be placed in public ownership, shall be subject to the approval of the city engineer. (Ord. 2000-23, 7-18-2000; amd. 2003 Code; Ord. 2004-19, 8-17-2004)

D. Those parts of any proposal to develop real property which jeopardize the public's health, safety or welfare, or significantly interferes with established long term development of the city, shall be subject to the approval of the city engineer after consultation with the appropriate city department. (Ord. 2000-23, 7-18-2000)

#### **11-8-5: PRELIMINARY DETERMINATION BY CITY ENGINEER:**

All proposals to grade, fill or excavate land, or to erect a structure for human habitation (sometimes referred to herein as the "proposal"), shall be referred to the city engineer who shall make a preliminary determination if any of the unsafe physical conditions described in section [11-8-3](#) of this chapter appear to exist in relation to the real property which is included in the proposal. (Ord. 2000-23, 7-18-2000)

## **11-8-6: REQUIREMENT TO SUBMIT A GEOTECHNICAL REPORT:**

- A. Except as otherwise provided in subsection C of this section, if the city engineer determines in the manner described in section [11-8-5](#) of this chapter that no unsafe physical condition described in section [11-8-3](#) of this chapter appears to exist in relation to the subject property, the proposal with respect to which the subject property is associated may proceed, as proposed, subject to the other requirements of this title.
- B. If the city engineer determines in the manner described in section [11-8-5](#) of this chapter that an unsafe physical condition described in section [11-8-3](#) of this chapter appears to exist in relation to the subject property, the applicant shall submit a geotechnical report and otherwise comply with the remainder of this chapter.
- C. With respect to any proposal not requiring a geotechnical report, the city engineer may require the applicant to submit other information to resolve issues with respect to the condition of the subject property. The city engineer may withhold the determination described in section [11-8-5](#) of this chapter until the required information has been received, and based on that information, the city engineer may require the submission of a geotechnical report. (Ord. 2000-23, 7-18-2000)

## **11-8-7: GEOTECHNICAL REPORT:**

- A. Information Required: A geotechnical report shall include maps and a report containing not less than the following information:
  - 1. Maps: The maps shall include:
    - a. The site location and regional setting of the subject property.
    - b. A geologic map which illustrates actual or potential landslides, fault zones, shallow water tables, expansive or collapsible soils, debris flows, flood areas, and any other pertinent natural or artificial features that might influence the stability of the subject property or adjacent property. Actual or probable surface and subsurface conditions shall be shown in relation to those that are conjectural, being clearly labeled as such. The proposed grading, filling, excavation or structure to be erected shall be shown in relation to the geologic features described above. Any corrective or remedial action necessary to avoid a violation of section [11-8-3](#) of this chapter shall be shown and shall be clearly identified as such.
    - c. Maps shall be a scale of one inch equals one hundred feet (1" = 100'), with contour lines at five foot (5') intervals. Existing contours shall be shown by dashed lines and proposed contours shall be shown as solid lines. Boring logs, cross sections, test trench logs, soil sample descriptions, and test results shall be included.
    - d. The city engineer may require additional maps or additional detail on existing maps as to evaluate actual or potential geologic hazards.



2. Report: The report shall include:

- a. A description of the proposed grading, filling, excavation or structure;
- b. An analysis of the effects of the proposed grading, filling, excavation or erection of a structure in relation to the geologic conditions shown on geologic maps;
- c. An analysis of how structures will be made reasonably safe for human habitation;
- d. Any corrective or remedial action necessary to avoid a violation of section [11-8-3](#) of this chapter, described and analyzed in detail;
- e. A list, including title, author and date, of all prior studies or reports which are relied upon to make this report;
- f. The city engineer may require additional information or analyses to evaluate actual or potential geologic hazards.

B. Sloped Lands: If the geotechnical report (maps and report) relates to land having an average slope that exceeds twenty five percent (25%), the development proposal described in the geotechnical report shall conform to the provisions of section [11-8-14](#) of this chapter. (Ord. 2000-23, 7-18-2000)

C. Waiver: In the case of a proposal to grade, fill or excavate, which is not directly or indirectly related to a proposal to erect a structure for human habitation, the city engineer may waive compliance with any requirement of this section relevant to the proposed grading, filling or excavating. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

### **11-8-8: ENGINEER QUALIFICATIONS:**

A. State License: A geotechnical report (described in section [11-8-7](#) of this chapter) shall be stamped and signed by a geotechnical engineer who shall be a licensed professional engineer registered in the state.

B. False Statements: In addition to any applicable private civil remedies, it shall be unlawful to knowingly make a false, untrue or incomplete statement in a geotechnical report or to sign the certificate described above knowing the same to be materially false or not true. (Ord. 2000-23, 7-18-2000)

### **11-8-9: POST CONSTRUCTION INSPECTION AND CERTIFICATION:**

For real property with respect to which development has proceeded on the basis of a geotechnical report which has been acknowledged by the city engineer, no final inspection shall be completed or certificate of occupancy issued or performance bond released until the engineer who signed and approved that geotechnical report shall further certify that the completed

improvements and structures conform to the descriptions and requirements contained in said report. Provided, however, the improvements and structures may, with the consent of the city engineer, deviate from the descriptions and requirements contained in the geotechnical report because of conditions which are discovered after acknowledgment by the city engineer of the report or geotechnical report. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

#### **11-8-10: APPEAL FROM DECISION OF CITY ENGINEER:**

Any person dissatisfied with a decision of the city engineer may appeal the same within thirty (30) days thereof to the Utah state board of appeals, created by the international building code. This board is authorized by this section to hear appeals from decisions of the city engineer, and shall affirm or reverse those decisions, either in whole or in part. Any person dissatisfied with a decision of the board of appeals may appeal that decision within thirty (30) days thereof to any court of competent jurisdiction for an administrative review. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

#### **11-8-11: SCOPE OF APPLICATION:**

No subdivision or other development plat or plan shall be approved without compliance with the provisions of this chapter. Every proposal to grade, fill or excavate land, and every proposal to erect a structure for human habitation shall be subject to this chapter, including proposals related to land in subdivisions or any other development plans which may have been approved prior to the adoption of the ordinance codified herein. (Ord. 2000-23, 7-18-2000)

#### **11-8-12: RESTRICTIVE COVENANT REQUIRED:**

If a geotechnical report, or other information required to resolve issues regarding the subject property, has been submitted to the city engineer, no subdivision plat or other development plan shall be approved and no building permit shall be issued for construction until the owners of the subject real property have signed and delivered a restrictive covenant to the city. The restrictive covenant shall be in a form suitable for recording and shall contain not less than the following:

- A. A complete description of the geotechnical condition of the subject real property, including references to relevant reports and studies;
- B. A description of grading, filling, excavating of land or erection of a structure for human habitation, as approved in the geotechnical report which was acknowledged by the city engineer, with the requirements and restrictions imposed thereon;
- C. A covenant and agreement enforceable by the city, adjoining landowners and any subsequent owner of the subject real property stating that only the grading, filling or excavating of land or erection of a structure in the acknowledged geotechnical report will be constructed or maintained on the property and no others. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

### **11-8-13: CIVIL AND CRIMINAL FRAUD:**

It shall be unlawful for any person, including the seller or his representative, directly or indirectly, in connection with the sale or offering for sale of real property located in the city, to make any untrue statement of a material fact related to the geotechnical condition of the subject property. This section shall be construed to create private and public civil causes of action in addition to creating criminal liability. (Ord. 2000-23, 7-18-2000)

### **11-8-14: HILLSIDE DEVELOPMENT STANDARDS:**

#### A. Grading:

1. No grading, filling or excavation of any kind shall be accomplished without first having obtained a grading permit from the city engineer based on the provisions of this subsection.
2. Land having an average slope of greater than twenty five percent (25%) shall be deemed to be land having a "steep slope" within the meaning of subsection [11-8-11B](#) of this chapter. Any person proposing to grade, excavate, fill or to erect any structure on such land shall submit a geotechnical report as though the same were required by the city engineer pursuant to subsection [11-8-6B](#) of this chapter. This subsection shall not apply if a geotechnical report (as required by this chapter) relating to the subject property has, at an earlier date, been acknowledged by the city engineer.
3. No grading, filling or excavation of land, or the erection of a structure, shall be permitted on land having an average slope in excess of twenty five percent (25%) except in compliance with the provisions of this section.
4. All rough street and site grading shall be completed prior to the installation of utilities.
5. Fills shall be compacted to at least ninety five percent (95%) of AASHTO (American association of state highway transportation officials) T180 density for those areas intended as structural foundations, including roadways.
6. Borrowing for fill shall be prohibited unless the material is obtained from a cut permitted under an approved grading plan, or imported from outside the hillside area of the city.
7. Cut slopes shall be constructed to eliminate sharp angles of intersection with the existing terrain and shall be rounded and contoured as necessary to blend with existing topography to the maximum extent possible. The city will not accept the dedication and maintenance of cut and fill slopes except those within the required street right of way. Where a cut or fill slope occurs between two (2) lots, the slope shall normally be made part of the downhill lot. (Ord. 2000-23, 7-18-2000)

8. The international building code shall be complied with, except that decisions described therein to be made by the "building official" may also be made by the city engineer. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)

#### B. Drainage:

1. Required storm water runoff collection facilities shall be designed so as to retain storm water runoff on development sites for a sufficient length of time so as to prevent flooding and erosion during storm water runoff flow periods.
2. Required storm water runoff collection facilities shall be so designed as to divert surface water away from cut faces or sloping surfaces of a fill. French drains are not acceptable.
3. Curb, gutter and pavement designs shall be such that water on roadways is prevented from flowing off the roadways.
4. Natural drainage shall be riprapped, or otherwise stabilized to the satisfaction of the city engineer, below drainage and culvert discharge points for a distance sufficient to convey the discharge without channel erosion.
5. Material from construction, including soil and other solid materials, shall not be deposited within a natural or manmade drainage course nor within irrigation channels.
6. Sediment catchment ponds shall be constructed downstream from each development, unless sediment retention facilities are otherwise provided.

#### C. Vegetation And Revegetation:

1. Every effort shall be made to conserve topsoil, which is removed during construction, for later use on areas requiring vegetation or landscaping, e.g., cut and fill slopes.
2. Areas not contained within lot boundaries shall be protected with adapted, fire-resistant species of perennial vegetal cover after all construction is completed. A list of acceptable species is available from the community development director.
3. New plantings shall be protected with organic cover.
4. All disturbed soil surfaces shall be stabilized before final acceptance of the subdivision by the city.
5. In all areas under the ownership and control of the subdivider, he shall be fully responsible for any destruction of native vegetation which is required to be retained, he shall carry the responsibility for such areas both for his own employees and for all subcontractors from the first

day of construction until final acceptance of the subdivision by the city. The subdivider shall be responsible for replacing such destroyed vegetation.

6. At the termination of the bonding period, any dead plant materials required and installed by the subdivider shall be replaced, and a new bond issued to assure establishment of the replaced materials.

#### D. Fire Protection:

1. Lot size and potential placement of buildings thereon shall be such that adequate clearance from hazardous, flammable vegetative cover may be accomplished.
2. All easements for firebreaks for safety of built up areas shall encompass access for firefighting personnel and equipment. Such easements shall be dedicated for this specific purpose by being recorded.
3. The inability to provide fire line water pressure consistent with the standards set by the insurance service organization shall be justification for denial of a subdivision request.

#### E. Streets:

1. Hillside streets should reflect a rural rather than urban character. Street alignments, where possible, should be parallel to contours, in valleys, or on ridges. If a location between a valley and a ridge is unavoidable, directional pavements shall be split, with the principal of grading being half cut and half fill versus all fill or all cut. Split streets may be provided by the subdivider according to the following schedule:
  - a. One lane in each direction; the split section width of the pavement shall be sixteen feet (16').
  - b. Two (2) lanes in each direction; the split section width of the pavement shall be twenty two feet (22'). The median between split streets shall not exceed the slope of two feet (2') horizontal for each one foot (1') vertical and such median shall be planted by the subdivider and maintained for one year, to the satisfaction of the city engineer. Where deemed appropriate by the city engineer, lots may be located between the split pavements and such lots may front on both lanes.
2. Collective driveways shall only be permitted where such utilization will result in better building access than would be possible if a public street were required. Said collective driveways shall not be used as required street frontage for the lots which they serve. Collective driveways permitted to serve a maximum of six (6) dwellings, shall be paved to a width not less than twelve feet (12') and shall not exceed one hundred fifty feet (150') in length. Collective driveways serving more than six (6) dwellings shall be paved to a width of not less than twenty feet (20') and shall not exceed three hundred fifty feet (350') in length. Turnarounds must be provided at the end of collective driveways. Signs indicating the driveways as private shall be erected in compliance with city standards. Collective driveways shall not be maintained in any way by the city.

3. Cul-de-sacs may serve no more than ten (10) dwelling units and shall be a maximum of four hundred feet (400') long. A suitable turnaround shall be provided at the end of stub streets.
4. Streets in hillside areas may intersect at the minimum angle of sixty degrees (60°), provided they meet all other legal requirements relating to the construction of streets.
5. The following minimum dimensions are to be utilized in the design of hillside streets:
  - a. All streets shall have suitable pavement edging, such as curbs and gutters. Concrete gutters must be provided where street drainage is accommodated.
  - b. The width of the graded section shall extend three feet (3') beyond the curb face or edge of sidewalk on the fill side and two feet (2') on the cut side of the street.
  - c. Sidewalks of not less than four feet (4') in width may be required on one side of minor streets and on both sides of a collector street, except that where adjacent to a curb, all sidewalks shall be five feet (5') in width.
  - d. Parking lanes, eight feet (8') in width, may be required on at least one side of all public streets except where existing topography renders development adjacent to the street impractical, or where the street serves solely as an access road, or where an adequate number of off street parking spaces are provided on each lot adjacent to the street. Streets without parking lanes shall be provided with emergency parking stalls adequate to contain at least two (2) vehicles per lot.
  - e. The following travel lane widths shall be required all hillside areas:
    - (1) The side of a travel lane not adjacent to another travel lane shall be increased by two feet (2').
    - (2) Minor hillside streets shall have a minimum travel lane of ten feet (10').
    - (3) Collector hillside streets shall have a minimum travel lane of twelve feet (12').
- F. Preservation Of Hillside Vistas: Development proposed at five thousand feet (5,000') ASL or above will be discouraged and will require compelling justification for approval by the planning commission. (Ord. 2000-23, 7-18-2000)

## **11-8-15: SHALLOW GROUND WATER AREA DEVELOPMENT STANDARDS:**

Development in shallow ground water areas shall be subject to the following standards:

- A. Wetlands will not be permitted to be included as part of any buildable subdivision or development lot. Exception: For developments within the R-R or A-1 zone, wetlands may be included as part of the development, providing there is sufficient buildable area to accommodate the proposed use. (Ord. 2000-23, 7-18-2000)

- B. Wetlands may not be included in area requirements for lots or for calculation of density unless all or a portion of the wetlands has been approved as a usable wetland area by the city council. (Ord. 2000-23, 7-18-2000; amd. 2003 Code)
- C. Where determined by the planning commission or designee, wetland areas may be required to be fenced if found to be detrimental to public health, safety or welfare.
- D. Prior to the acceptance by the city of petition for rezoning of property in the designated shallow ground water area, or before the submission of an application for preliminary subdivision in the designated shallow ground water area, it must be demonstrated to the satisfaction of the planning commission that the conditions and requirements contained herein can be met. A predevelopment conference with the plan coordinating committee and developer will be required to review any concept plans.
- E. Prior to acceptance by the city of an application for final subdivision plat in the specified area, it must be demonstrated to the satisfaction of the planning commission that all of the conditions specified in this policy have been fully met and accomplished.
- F. Surface or subsurface drainage from any development within the subject area shall be transported to Utah Lake, and shall not be deposited, collected or stored upon the property being developed or upon other properties within the subject area.
- G. Drainage water from the proposed new development will not be placed upon or pass through other properties, except:
  - 1. Where a preexisting drainage system of adequate capacity is already in use; or
  - 2. Where a permanent drainage easement of a size sufficient to carry projected flows has been obtained and a statement from the owners of both the host and guest properties recorded on proper deeds in the office of the county recorder specifying the following:
    - a. The city will be held harmless from all damages or injury resulting from water pollution and/or flooding from drainage crossing said property.
    - b. The property owner will allow the owner of the easement to enter onto said property to maintain the drainage facility on said easement.
    - c. The drainage channel can be placed in a pipe or culvert at such time as deemed appropriate by the owner of the easement.
- H. Drainage from the proposed new development will not be placed in an irrigation ditch or irrigation canal, originally constructed for irrigation purposes, except where permission, in written and recorded instruments (i.e., easements) running with the land, has been granted by the irrigation company specifying the following:

1. The city will be held harmless from all damage or injury resulting from flooding, water pollution, or high ground water from drainage in the ditch or canal.
2. The irrigation ditch or canal can be placed in a pipe or culvert at a time deemed necessary by the owner of the easement, except for the channels provided for in the master storm water management plan, wherein the channels are to remain in an open, nonpiped condition (section [8-6-5](#) of this code).
3. The owner of property which is the subject of a development plan will provide, and record with the county recorder, a statement holding the city harmless from all damage within the project resulting from flooding or shallow ground water.
4. A disclosure statement be placed upon all subdivision plats in the subject area, stating that the subdivision lot is in an area potentially subject to flooding and/or shallow ground water.
5. Drainage easements be granted to the city within the proposed development, as determined by the city engineer, and drainage facilities be installed as part of the development at developer's expense.
  - I. No building shall be allowed to be constructed in a shallow ground water area of the city where the building proposed to be built includes a basement, except in accordance with the following standards: prior to the issuance of the building permit, the owner shall produce a statement which has been recorded on proper deeds in the office of the county recorder, stating that the city will be held harmless from all damages or injury resulting from flooding or any other damage resulting from a shallow ground water area.
  - J. A comprehensive drainage and grading plan is to be submitted by the developer of any property within a shallow ground water area. The plan shall be approved by the city engineer before final residential subdivision approval, or approval is given for any commercial or industrial development or building.
1. Approval of, and signatures by, all irrigation and canal companies if their ditches or canals cross the development areas, or if surface or subsurface drainage is to outfall into the ditch or canal.
2. Quantities of runoff shall be determined for the complete development area by any engineering method acceptable to the city engineer.
3. At all outfall points from the development, quantities of runoff for a 10-year storm shall be determined and indicated on the plan in cubic feet per second.
4. The capacity of any irrigation ditch, storm drain or other channel shall be determined from the inlet point to the outfall point of said channel, if it is to be used for runoff. If there is an insufficient capacity to handle added flows, it will not be used.



5. A topographic map shall be prepared indicating sufficient slopes in all areas to take surface drainage water into the designated street or storm drain. Water will not be allowed to pond any place other than a designated detention basin.
6. A plan of all proposed curbs, gutters and cross gutters shall be submitted. Such plan shall indicate on each curb the proposed grade, direction of flow, and quantity of flow. If the gutter capacity is less than that required for a 10-year storm, storm drains will be required.
7. No french drains or sumps will be allowed in the developments as part of the drainage plans.
8. No building permit shall be issued in any development in the described area until the required subsurface and storm drainage system has been constructed and is in operable condition.
9. Accompanying the drainage and grading plan will be a soils test provided by a licensed professional engineer for all areas in which underground private and public utilities will be installed. The engineer's statement must indicate what remedial action is anticipated to be taken to stabilize utility lines to assure that they will not shift, buckle or lose alignment.
10. The said engineering plan shall include a cross section of all proposed utility trenches showing configuration and type of materials to be used in backfill and as a "bed" for utility lines; the same to be approved by the city engineer.
11. All water mains in shallow ground water areas must be poly wrapped. (Ord. 2000-23, 7-18-2000)

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### APPENDIX D - STANDARD OPERATING PROCEDURES (SOP)

#### CONTENTS

<i>APPENDIX D - Standard Operating Procedures (SOP)</i> .....	1
Standard Operating Procedure (SOP) – SWMP Implementation and Evaluation .....	3
Standard Operating Procedure (SOP) – SWMP Training.....	5
Standard Operating Procedure (SOP) – Locating and Listing Priority Areas.....	7
Standard Operating Procedure (SOP) – Spill/Dumping Response and Flow Chart .....	9
Standard Operating Procedure (SOP) – Tracing Illicit Discharge .....	11
Standard Operating Procedure (SOP) – Characterizing Illicit Discharge .....	13
Standard Operating Procedure (SOP) – Ceasing illicit Discharge.....	15
Standard Operating Procedure (SOP) – IDDE Program Evaluation and Assessment .....	17
Standard Operating Procedure (SOP) – Construction Site Ordinance Enforcement .....	18
Standard Operating Procedure (SOP) – SWPPP Review and Approval.....	21
Standard Operating Procedure (SOP) – Construction Site Inspection.....	24
Standard Operating Procedure (SOP) – Record Keeping .....	30
Standard Operating Procedure (SOP) – Post-Construction Ordinance Enforcement .....	33

Standard Operating Procedure (SOP) – Post-Construction Inspection.....	35
Standard Operating Procedure (SOP) – Fertilizer, Pesticide, and Herbicide Application.....	36
Standard Operating Procedure (SOP) – Spill Prevention and Reporting.....	39
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for City Buildings and Facilities .....	42
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for City Material Storage Areas .....	45
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for Heavy Equipment Storage Areas and Maintenance Areas .....	47
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for City Parks and Open Space.....	49
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for City Vehicles and Equipment.....	53
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for Street Sweeping, Sweeper Cleaning, and Waste Disposal .....	55
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for Parking Lot Maintenance .....	58
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for Street and Road Maintenance and Repair .....	60
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for City Storm Water Collection and Conveyance System .....	63
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for “High Priority” Smith Property Material Staging Area .....	65
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for “High Priority” Cemetery .....	67
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for “High Priority” Rodeo Grounds.....	70
Standard Operating Procedure (SOP) – Storm Water Pollutant Management for “High Priority” Public Works Yard.....	73

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

---

### STANDARD OPERATING PROCEDURE (SOP) – SWMP IMPLEMENTATION AND EVALUATION

The following is an ongoing documentation process for gathering, maintaining and using information to conduct planning, set priorities, track the development and implementation of the SWMP, evaluate Permit compliance/non-compliance, and evaluate the effectiveness of the SWMP implementation.

1. Review and update SWMP annually prior to yearly report submitted to the Division.
  - a. Review BMP's for each control measure and evaluate compliance on each.
  - b. Rate compliance on each BMP with: 1-implemented or completed, 3-in process of being implemented or completed, 5-not implemented or completed.
  - c. Note areas on non-compliance with Permit.
  - d. Non-compliance areas become high priority for the next year.
2. Review questionnaires submitted by residents. Compare to previous years to evaluate effectiveness of education program.
3. Review questionnaires completed by employees who have completed training. Compare to previous years to evaluate effectiveness of education program. Review list of employees who have taken training and compare with previous years and verify SOP: *SWMP Training* was followed.

4. Review and compare yearly comments from Public from the public hearings, committees, and web site comments. Compare to previous years to evaluate effectiveness of education program.
5. Track and compare the participation in the household hazardous waste collection program.
6. Review number and type of illicit discharges reported for the year. Compare results from previous years to evaluate effectiveness of program.
7. Review IDDE inspections and reports. Compare results from previous years to evaluate effectiveness of program.
8. Review enforcement actions for control measures 3, 4, & 5. Compare results from previous years to evaluate effectiveness of program.
9. Review construction and post construction inspection reports. Compare results from previous years to evaluate effectiveness of program.
10. Review City Facility inventory, assessment, and inspections. Compare to previous years to track improvements.
11. Review flood control inspection reports. Compare results from previous years to evaluate effectiveness of program.

# Pleasant Grove



Utah's City of Trees

12.

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – SWMP TRAINING

The following list gives the yearly training required for each control measure and the people involved.

1. Control Measure 1
  - a. Employees of City owned or operated facilities – Prohabition against and the water quality impacts associated with illicit discharges and improper disposal of waste.
  - b. MS4 engineers, development and plan review staff, land use planners – LID practices, green infrastructure, post-construction control requirements, and associated BMP's.
2. Control Measure 3
  - a. Field staff – identification, investigation, termination, cleanup, and reporting of illicit discharges.
  - b. Office staff – illicit discharge reporting.
3. Control Measure 4
  - a. Field and other staff – implementation of the construction strom water program, including permitting, plan review, construction site inspections, and enforcement.
4. Control Measure 5

- a. Field and other staff – involved in post-construction storm water management, including, planning, and review, and inspections, and enforcement.
5. Control Measure 6
- a. All employees who have primary construction, operation, maintenance job functions that are likely to impact storm water quality – O&M program including SOP's.
6. Documentation
- a. Record and document dates, activities or course descriptions, and names and positions of staff in attendance.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – LOCATING AND LISTING PRIORITY AREAS

The following are written systematic procedures to locate and list the priority areas listed in 4.2.3.3.1 of the Small MS4 General UPDES Permit likely to have illicit discharges as applicable to Pleasant Grove City.

1. Obtain and review current City land use and zoning maps from City's GIS system.
2. Obtain and review current storm drain system map from City's GIS system.
3. Obtain and review current storm drain outfall map from City's GIS system.
4. Create and or update on the City GIS system a priority areas map which include the following items:
  - a. illicit connection locations including non storm water discharges that do not need to be addressed as part of the City's SWMP. Discharges not addressed include the following.
    - i. waterline flushing, landscape irrigation, diverted stream flows, rising ground water, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioner condensate, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering runoff, Individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, residual street wash water, dechlorinated water reservoir discharges, discharges or flows from emergency fire fighting activity, other similar discharges.



- b. Illegal dumping locations.
  - c. Areas with older infrastructure that are more likely to have illicit connections. Older areas are defined as historical overlay zone.
  - d. Industrial, commercial, and mixed use areas.
  - e. Areas with onsite sewage disposal systems.
  - f. Areas with older sewer lines or with a history of sewer overflows or crossconnections.
  - g. Commercial or high density residential areas that are required to have a post construction storm water management plan.
  - h. Areas upstream of sensitive waterbodies.
  - i. Storm sewer outfalls.
5. Create and or update a list of priority areas based on the map created above. The list shall include the reasons why an area is included in the priority list.
6. The City will be divided into three priority areas as follows:
  - a. Priority I areas include: areas with past history of history of illicit connections (not listed in 4.a.i), illegal dumping, or sewer overflows and crossconnections, all commercial, industrial, or mixed use land use areas, areas with onsite sewage disposal systems, storm system areas greater than 30 years old, and areas upstream of sensitive water bodies.
  - b. Priority II areas include: Storm sewer outfalls.
  - c. Priority III areas include the balance of the City.
7. Inspect all priority I areas on a yearly basis.
8. Inspect 20 percent of priority II areas annually.
9. Priority III areas will only be inspected during regular maintenance of the storm drain system or if illicit connections and or dumping is reported.
10. Update list and map on a yearly basis.

# Pleasant Grove



Utah's City of Trees

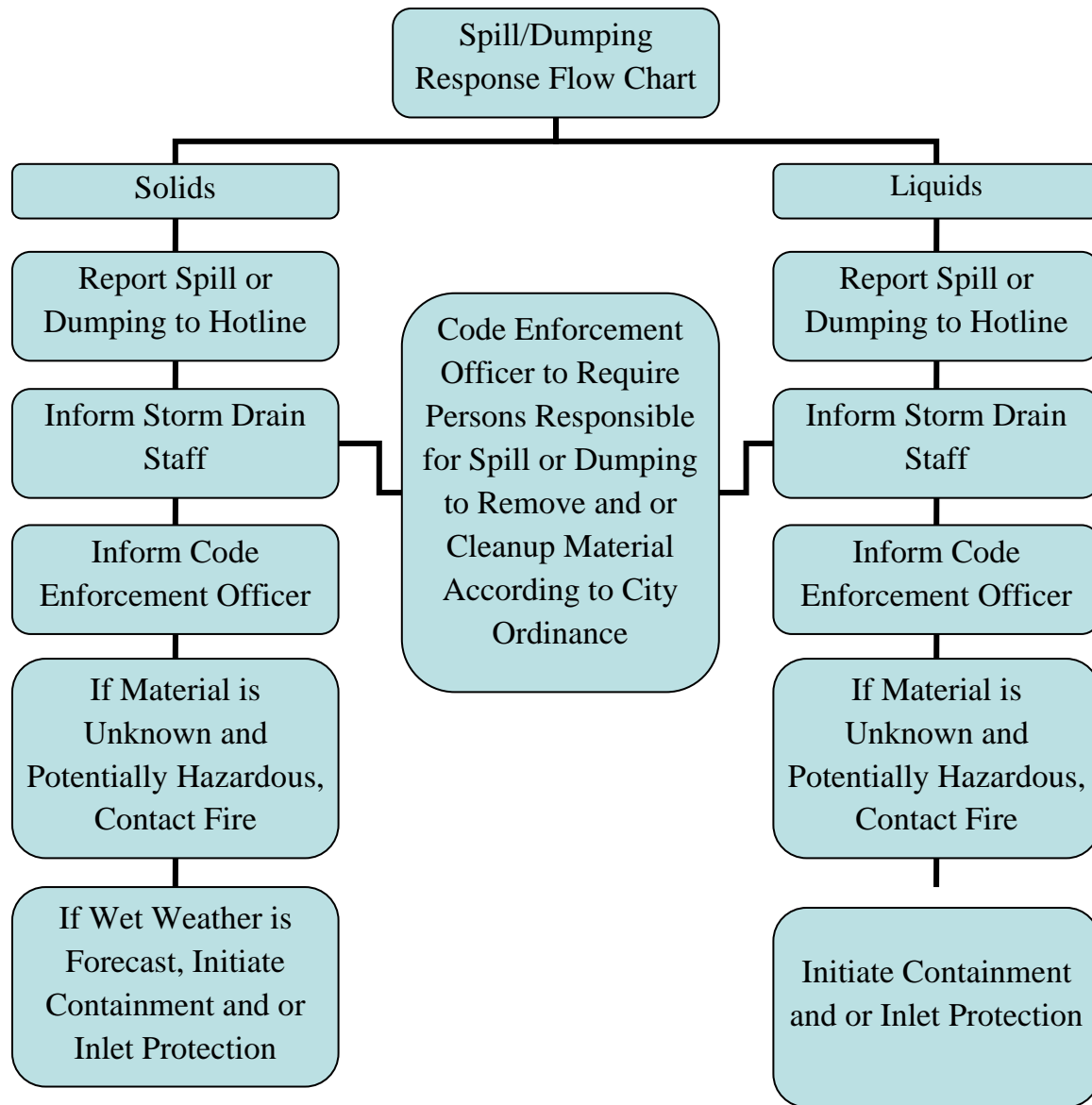
## Storm Water Management Plan

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### **STANDARD OPERATING PROCEDURE (SOP) – SPILL/DUMPING RESPONSE AND FLOW CHART**

In the event of a spill or dumping material that has the potential to impact the City's storm drain system the City will follow the attached flow chart and standard operating procedures.

1. When City staff becomes aware of a spill or dumping they will call the Hotline to report spill or dump for record keeping purposes. When a spill or dumping has been reported to the City from outside sources the City will proceed with step number 2.
2. Follow flow chart on following page.
3. Follow SOP Characterizing Illicit Discharge.
4. Follow SOP Ceasing Illicit Discharge.



# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – TRACING ILLICIT DISCHARGE

Once an illicit discharge has been identified through dry weather screening, other inspections, public reporting, potential analytical testing, ect., City Staff will attempt to trace the discharge to its source through the following steps:

1. Consult storm sewer maps
2. Check the next “upstream” manhole with a junction to see if there is evidence of the illicit discharge.
3. Repeat these steps until a junction is found with no evidence of discharge; the discharge source is likely to be located between the junction with no evidence of discharge and the next downstream junction.
4. Be aware of the surrounding areas and look for the illicit discharge or spills in gutters and streets.
5. If source is not apparent video inspect storm drain to attempt to locate connection where illicit discharge is occurring.
6. Utilize additional techniques as appropriate to pinpoint the source of the discharge. These techniques may include: dye tracing, smoke testing, analytical monitoring.
  - a. Analytical monitoring will be utilized as appropriate to trace an illicit discharge but will generally be utilized as a last resort.
  - b. When appropriate, Table X in the appendix will serve as a guide to analytical monitoring efforts.

7. Document tracing efforts.
8. Continue IDDE program through SOP Characterization Illicit Discharge and SOP Ceasing Illicit Discharge.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – CHARACTERIZING ILLICIT DISCHARGE

Once an Illicit discharge has been reported, identified, and or traced the following SOP will be followed to characterize the nature of and the potential public or environmental threat posed by the illicit discharge.

1. Initiate an investigation immediately.
2. Create an inspection report covering the following items:
  - a. Date City became aware of the non-storm water discharge,
  - b. Date the City initiated an investigation of the discharge,
  - c. Date the discharge was observed,
  - d. Location of the discharge,
  - e. Description of the discharge,
  - f. Method of discovery,
  - g. Date of removal,
  - h. Repair,
  - i. Enforcement actions,
  - j. Date and method of removal verification,

- k. Fully document any analytical monitoring utilized including decision process to utilize analytical monitoring.
3. Determine if illicit discharge is among those that do not require addressing as part of the City's SWMP. If an illicit discharge does not need to be addressed, file documentation including its location for future addition to City's maps. Discharges not addressed include the following.
  - a. waterline flushing, landscape irrigation, diverted stream flows, rising ground water, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioner condensate, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering runoff, Individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, residual street wash water, dechlorinated water reservoir discharges, discharges or flows from fire fighting activity, other similar discharges.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – CEASING ILLICIT DISCHARGE

Once an Illicit Discharge has been confirmed, the following SOP will be followed to ensure the illicit discharge will cease.

1. Confirm SOP-Characterizing Illicit Discharge has been followed.
2. Notify the appropriate authorities.
  - a. Storm Water Forman for all discharges.
  - b. Any hazardous materials follow Appendix J.
3. Notify the property owner to cease the illicit discharge and clean up as appropriate.
  - a. Verbal notification to tenant or on site owner's representative.
  - b. Leave written notice and citation on premises.
  - c. Certified letter to owner of record.
4. Provide technical assistance for removing the source of the discharge or otherwise eliminating the discharge.
  - a. Provide a list of engineers that can design BMP's to eliminate the discharge.
  - b. Provide a list of local contractors that can assist with non hazardous material cleanup.
  - c. Provide a list of disaster cleanup contractors for hazardous discharges.



- d. Provide State of Utah Department of Environmental Quality contact information.
5. Provide follow up inspections.
  - a. Follow up inspections will be undertaken as determined until discharge is eliminated and cleaned up.
6. Legal action consists of the following escalating penalties.
  - a. First day with illegal discharges to the City Storm Drain System is at least a Level I Violation or infraction subject to a \$500 Fine.
  - b. Second day with illegal discharges to the City Storm Drain System is at least a Level II Violation or Class C misdemeanor and shall be punishable by a fine in a sum not to exceed seven hundred fifty dollars (\$750.00), or by imprisonment for a period not longer than ninety (90) days, or by both such fine and imprisonment.
  - c. Each additional day is an additional Class C misdemeanor until 7 days.
  - d. After 7 days it becomes a Level III Violation or Class B Misdemeanor and shall be punishable by a fine in a sum not to exceed one thousand dollars (\$1,000.00), or by imprisonment for a period not longer than six (6) Months, or by both such fine and imprisonment.
  - e. Each day additional day is an additional Class B misdemeanor.
  - f. When a person is convicted of a violation, any license previously issued to him by the City may be revoked by the court or by the governing body.
  - g. If, as the result of the violation of any provision of this chapter, the city or any other party suffers damages, fines, incurs investigative or clean up costs, or is required to make repairs and/or replace any materials, the cost of investigations, fines, repair or replacement shall be borne by the party in violation, in addition to any criminal fines and/or penalties.
  - h. If there are three violations at any level within 24 months the next violation is automatically escalated by one level.
7. Document all inspection and enforcement actions.
8. Review and or update SOP on an annual basis in conjunction with yearly reporting.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### **STANDARD OPERATING PROCEDURE (SOP) – IDDE PROGRAM EVALUATION AND ASSESSMENT**

Annually in conjunction with its SWMP report the City will evaluate and assess its IDDE program according to the following procedures.

1. Review illicit discharges that have occurred in the past five years.
2. Track number and types of illicit discharges reported.
3. Compare illicit discharge information from year to year in order to evaluate effectiveness of the program.
4. Follow SOP-Locating and Listing Priority Areas and determine if maps need to be updated.
5. Update maps as necessary.
6. Review and or update SOP on an annual basis in conjunction with yearly reporting.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – CONSTRUCTION SITE ORDINANCE

#### ENFORCEMENT

1. Review Construction SWPPP according to SOP SWPPP Review and Approval.
  - a. Require completed and approved SWPPP prior to allowing construction to commence.
2. Conduct Pre-Construction Meeting.
  - a. Fill out Pre-construction checklist and provide copy to property owner.
  - b. Inform property owner of enforcement provisions.
  - c. Require submission of NOI to the State with a copy to the City.
  - d. Review SWPPP and make modifications as appropriate.
3. Conduct initial inspection utilizing Construction Storm Water Inspection Form.
  - a. If deficiencies are noted verbally request compliance with SWPPP.
  - b. If actions are not initiated to correct deficiencies issue stop work order (Red Tag).
  - c. No inspections or permits are issued until SWPPP is in place and functioning.
  - d. If inaction results in discharges to the City Storm drain system, initiate legal actions against property owner.
  - e. Document all actions.
4. Conduct inspections every two weeks utilizing Construction Storm Water Inspection Form.
  - a. If deficiencies are noted verbally request compliance with SWPPP.
  - b. If actions are not initiated to correct deficiencies issue stop work order (Red Tag).
  - c. If inaction results in discharges to the City Storm drain system, initiate legal actions against property owner.
  - d. Document all actions.
5. Conduct final inspection utilizing Construction Storm Water Inspection Form.

- a. Require submission of NOT to the City and State (as appropriate).
  - b. Require contract information for those in charge of Long Term Storm Water Management on the site.
  - c. Final approval or occupancy Permit not issued until final items are complete, NOT is received and Maintenance Agreement is signed and recorded.
  - d. If inaction results in discharges to the City Storm drain system, initiate legal actions against property owner.
  - e. Document all actions.
6. Legal action consists of the following escalating penalties.
- a. First day warning of violation, without actual discharges to the City Storm Drain System, is considered Level I Violation or infraction subject to a \$0 Fine.
  - b. Red Tag.
  - c. Second day of violation after warning, without actual discharges to the City Storm Drain System, is considered Level I Violation or infraction subject to a \$100 Fine.
  - d. Third day of violation after warning, without actual discharges to the City Storm Drain System, is considered Level I Violation or infraction subject to a \$300 Fine.
  - e. If the situation is not corrected after the third day it shall be elevated to a Level II Violation and follow the procedures listed below.
  - f. First day with illegal discharges to the City Storm Drain System is Level I Violation or infraction subject to a \$500 Fine.
  - g. Second day with illegal discharges to the City Storm Drain System is a Level II Violation or Class C misdemeanor and shall be punishable by a fine in a sum not to exceed seven hundred fifty dollars (\$750.00), or by imprisonment for a period not longer than ninety (90) days, or by both such fine and imprisonment.
  - h. Each additional day is an additional Class C misdemeanor until 7 days.
  - i. After 7 days it becomes a Level III Violation or Class B Misdemeanor and shall be punishable by a fine in a sum not to exceed one thousand dollars (\$1,000.00), or by imprisonment for a period not longer than six (6) Months, or by both such fine and imprisonment.
  - j. Each day additional day is an additional Class B misdemeanor.
  - k. When a person is convicted of a violation, any license previously issued to him by the City may be revoked by the court or by the governing body.
  - l. If, as the result of the violation of any provision of this chapter, the city or any other party suffers damages, fines, incurs investigative or clean up costs, or is required to make repairs and/or replace any materials, the cost of investigations, fines, repair or replacement shall be borne by the party in violation, in addition to any criminal fines and/or penalties.

- m. Repeat offenders (3 or more level I or greater violations within 24 months) or those with unpaid fines shall be ineligible to pull a permit for a period of one year of last offence and all fines are paid.
- n. If there three violations at any level within 24 months the next violation is automatically escalated by one level.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – SWPPP REVIEW AND APPROVAL

All proposed private development projects in the City will undergo a SWPPP review and approval process. This process includes both construction and post-construction SWPPP's. The City Engineer or his representative reviews the plans according to the requirements in the City's storm water technical manual and the attached check list. Development plans are not approved until applicable construction and post-construction SWPPP's have been developed and approved. Review comment documentation is maintained in the project folders at the community development office.

All projects that require a SWPPP are required to obtain a permit from the State of Utah Division of Water Quality according to the UPDES Storm Water General Permit for Construction Activities, UTRC00000. They are also required to utilize the SWPPP template provided by the Division.

### STORM WATER MANAGEMENT PLAN

- Storm drainage calculations which include:
  - The signature and stamp of a professional engineer.
  - Use of area-specific storm intensities found on the following website:  
[http://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html?bkmrk=ut](http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ut)
  - A map showing drainage sub-basins, the location and drainage area of any storm water that flows into the proposed development, and the piping system.
  - Cumulative peak flow calculations for the site (submit all input data, calculations, and results). (11-7-7:F.2.a)

- Capacity calculations for each segment of the pipe system. Verify that the 25-year storm can be carried by the pipe system. (11-7-7:F.2.b)
- Calculations showing that flow rates in streets do not exceed maximum allowable values before reaching storm drain inlets.
- Calculations showing that inlets are sufficiently designed to capture peak design flows.
- Identify the flow rate of the 100-year storm that is not carried by the pipe system.
- Detention calculations which include the following items are required for all developments other than single-family residential housing:
  - Detention volume requirement—an analysis that identifies the storm whose duration creates the greatest detention volume requirement, given the storm duration and stage storage curve and outlet discharge curve. (11-7-7:F.2.c)
  - Stage storage curve. (11-7-7:F.2.c)
  - Outlet discharge curve. (11-7-7:F.2.c)
  - Orifice calculations showing the allowable discharge rate is not exceeded. (11-7-7:F.2.c)

Obtain site specific storm data from the following website:

[http://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html?bkmrk=ut](http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ut)

- A construction storm water pollution prevention plan which includes: (draft prepared by design engineer and finalized by construction contractor)
  - 11"x17" Site plan with Location and type of BMP's to be implemented. (finalized by contractor)
  - 8.5"x11" BMP's to be implemented. (finalized by contractor)
  - SWPPP template updated for specific site. (by contractor)
  
- A Long-term Storm Water Management Plan which shows BMP locations, design, installation, operation and maintenance. (Pleasant Grove City Storm Water Management Plan 4.2.5.1)
  - Site Plan showing all storm drainage improvements and contours.
  - Required language.
  - Name and contact information of person responsible to implement.
  - Final storm drain calculations.
  - BMP's to be implemented.
  - Maintenance agreement.

- Review potential water quality impacts – See section 4.2.4.3. ie is the site immediately adjacent to impaired waters or live water that empties into Utah Lake? If so it requires more frequent inspections. (currently there are no waters listed as impaired with respect to sediment that the City discharges into.)
- Review flood management control structures
  - Does the site have a potential to discharge pollutants of concern as listed in Section 4.2.1.1 to the MS4?
  - If so, then do the proposed controls adequately limit or remove the pollutants of concern?
  - If not then determine and require the best available controls to limit or remove the pollutants.
  - Do the controls have adequate access for City or other maintenance personnel and equipment?
  - If not then require adequate access in the design.
  - Do the hydraulic controls adequately mimic pre-development storm water flows?
  - If not, then require modified hydraulic controls to more closely mimic pre-development storm water flows.
- Require management of 90<sup>th</sup> percentile storm onsite
  - Utilize LID Handbook to determine what is feasible and not feasible
- Hillside areas shall show existing vegetation and re-vegetation proposal
- Sensitive Lands Ordinance (Hillside, Shallow Groundwater, Fault Zones, Surface Water)
- Storm water discharge permit as required by the Utah Division of Water Quality (801-538-6146).
- Construction Storm Water Management Plan containing all requirements of the Pleasant Grove City Storm Water Management Program ([http://www.pgcity.org/publicworks/storm\\_water\\_management.htm](http://www.pgcity.org/publicworks/storm_water_management.htm)).
- Post Construction Storm Water Management plan containing all requirements of the Pleasant Grove City Storm Water Management Program. ([http://www.pgcity.org/publicworks/storm\\_water\\_management.htm](http://www.pgcity.org/publicworks/storm_water_management.htm)).
- Signed and recorded maintenance agreement.



# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – CONSTRUCTION SITE INSPECTION

#### **AUTHORITY TO INSPECT.**

Whenever necessary to make an inspection to enforce any provision of the City ordinance or whenever the City has cause to believe that there exists, or potentially exists, a condition, which constitutes a violation of the city ordinance. The City may enter the premises at all reasonable times to inspect and to inspect and copy records related to storm water compliance. In the event the owner or occupant refuses entry after a request to enter and inspect has been made, the City is hereby empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

#### **SITE INSPECTION**

##### *What Items are required for Inspection?*

The following is a list of some of the most common health and safety gear that may be used:

- Mud Boots
- Rain Coat
- Digital Camera
- GPS Unit
- Site Folder (Permit, Plans, etc.)
- Pen
- I.D. Badge
- Job Site Inspection Report (UPDES) Form (checklist)
- Hard Hat
- Safety Vest

### ***Monitoring Equipment***

The following is a list of some equipment that may be helpful to document facts and verify compliance:

- Digital Camera
- Measuring tape or wheel
- Hand level

### ***First Inspection:***

1. The Storm Water Project Manager /inspector shall familiarize himself/herself with the Erosion and Sediment Control Plans /SWPPP and identify all BMPs prior to the initial site inspection.
2. At the time of inspection, the inspector shall introduce himself/herself to the site superintendent and review the plans on site. Items to “look for” in the initial meeting with superintendent include:
  - If required, the SWPPP template is displayed on site.
  - Approved SWPPP Template.
  - Site Maps, 3 total (Full size)
    - One map showing the BMP’s that are going to be used with details.
    - One map showing the area of disturbance with contour lines.
    - One map showing permanent post construction BMP’s.
  - State of Utah UPDES NOI is posted on site
  - UPDES General Construction Permit.
  - Copy of approved, stamped SWPPP /Erosion and Sediment Control Plans is maintained on site.
  - Inspection logs and or logbooks
  - Is project causing water quality standard violations.
  - Does required Stormwater Pollution Prevention Plan (SWPPP) includes appropriate erosion and sediment controls and, to some extent, post construction controls.
  - Is owner/operator complying with the SWPPP;
  - Are self-inspections being properly performed; and
  - Is the owner/operator responds appropriately to the self-inspector’s reports.
3. During the site inspection, it is the Storm Water Project Manager /inspector responsibility to insure that all structural site erosion controls (BMPs) have been installed according to the approved SWPPP plans.

4. All aspects of the inspection shall be documented in the UPDES. Photos shall be taken of current site conditions.

#### **ROUTINE INSPECTION/TIMING AND FREQUENCY OF INSPECTIONS:**

1. Site inspections shall be conducted at minimum of once a month or more if needed throughout the duration of the Land Disturbance Permit activity. Inspections shall be scheduled based on project phase (i.e.: during heavy grading activity more frequent inspections are required, once interior building activity has begun less frequent inspections are required). Wet-event inspections of construction sites shall be completed within 24-hours of appreciable rainfall event.
2. The inspector shall prepare a written report summarizing inspection results. The inspection report is then provided to the Permittee, or the Permittees duly authorized representative, and to the contractor responsible for implementing stormwater controls on-site in order to correct deficiencies noted in the inspection report. Finally, the inspection report must be added to the site log book that is required to be maintained on-site, and be available to regulatory oversight authorities for review.
3. All information associated with site inspections shall be documented. Each (over one-acre) inspection shall be recorded using a UDPEs form. Items associated with the inspection shall be noted on the form, signed by the contractor on site and by the Stormwater project manager /inspector. Copies of the UPDES Form shall be left with the contractor or site attendant and the original report sheet remains with the inspector. Additional copy will be mailed to the Department of Environmental Quality (DEQ). Photos of the site shall be taken during the inspection. If there is nobody on site, the UPDES Form should be sent by fax or email.(if no fax no. available, then by mail) to the contractor/developer office.

#### **On-site Inspection Process:**

1. **Professionalism**, Don't Pretend to Possess Knowledge.  
Unless the inspector has experience with a particular management practice, do not pretend to possess knowledge. Inspectors cannot be expert in all areas; their job is to collect information, not to demonstrate superior wisdom. Site operators are often willing to talk to someone who is inquisitive and interested. Within reason, asking questions to obtain new information about a management practice, construction technique or piece of equipment is one of the inspector's main roles in an inspection.

Don't Recommend Solutions.

The inspector should not recommend solutions or endorse products. The solution to a compliance problem may appear obvious based on the inspector's experience. However, the responsibility should be placed on the site owner/responsible person to implement a workable solution to a compliance problem that meets UPDES

standards. The inspector should refer the site operator to the UPDES Standards and Specifications for Erosion and Sediment Control. Key advice must be offered carefully. One experienced stormwater inspector suggests saying: “I can’t direct you or make recommendations, but what we’ve seen work in other situations is ...” The way inspectors present themselves is important to the effectiveness of the inspection. An inspector cannot be overly familiar, but will be more effective if able to establish a minimum level of communication.

**2. *Walk the Site.***

During wet weather conditions, it may be advantageous to observe the receiving waters prior to walking the rest of the site. At some point during the inspection, the receiving water conditions must be observed and noted. It is critical to note if there is a substantial visible contrast to natural conditions, or evidence of deposition, stream bank erosion, construction debris or waste materials (e.g. concrete washouts) in the receiving stream. Each inspector should evaluate actual implementation and maintenance of practices on-site compared to how implementation and maintenance is detailed in the SWPPP. At a minimum, the inspector should observe all areas of active construction. Observing equipment or materials storage, recently stabilized areas, or stockpile areas is also appropriate to evaluate the effectiveness of management practices.

**3. *Taking Photographs***

Evidence of poor receiving water conditions and poor or ineffective practices should be documented with digital photographs. Those photographs should be logged date stamped and stored on media that cannot be edited (e.g. write only CDs). Photos should also be appended to the site inspector’s report.

It is also beneficial to take photographs of good practices for educational and technology transfer reasons.

**4. *Exit Interview***

Clearly communicate expectations and consequences. If it is clear from the inspection that the owner/operator must modify the SWPPP, or modify Best management practices within an assigned period (e.g. 24 hours, 48 hours, one week, two weeks), then that finding should be communicated at the time of the exit interview. The inspector should assign the period based on factors such as how long it would reasonably take to complete such modifications and the level of risk to water quality associated with failure to make such modifications.

The inspector should make clear that UPDES reserves rights to future enforcement actions. If the inspector's supervisor or enforcement coordinator determines additional enforcement actions are necessary, the Inspector *should not* reassure the owner/operator that the current situation is acceptable.

***Post Construction Inspection:***

1. The Stormwater Project Manager/inspector shall conduct final inspection to confirm that the site, including the detention pond, is stable.
2. Final inspection should include site stabilization with final landscaping or temp re-vegetation.
3. Detention pond should be measured to insure compliance with the approved plans (ie: size, shape, design). Emergency spillway should be installed per approved plan.
4. Geotextile material should be properly installed in drainage swales or emergency spillway per manufacturer's specifications.
5. Stormwater infrastructure should be inspected to insure that pipes are the size specified by the approved plans, all pipes and structures should be sealed and clear of sediment deposition.
6. Verify that site conditions (especially structures) match approved plans; revisions required either as-built or revised plans. All revisions shall be approved by the Plan Reviewer staff.

***Method of Documentation***

1. Upon returning to the office, site inspections shall be recorded in appropriate computer database.
2. Photos shall be imported into the appropriate database.
3. Original copies of the UPDES Form shall be deposited into the appropriate box (In the Storm water project manager's office) for scanning into the appropriate computer database.
4. The Storm Water Project Manager/inspector shall maintain all documentation.

**COMPLIANCE & ENFORCEMENT (REPORTING OF VIOLATIONS)**

1. See Enforcement SOP
2. Documentation is critical to effective enforcement. Advanced enforcement shall be documented for tracking purposes in an electronic database managed in the Storm waster pollution prevention management program.
3. It is the responsibility of the inspector to maintain time limits, specified by enforcement levels, and re-inspect on appropriate dates. Timely follow-up inspection is critical.

## **NOTICE OF TERMINATION**

Once final site inspection is completed, site matches approved plans or as-built have been approved, the Land Disturbance Permit may be terminated by the owner and or the responsible personal. The closure process involves a post construction inspection. Once the inspection passes, the Stormwater projects manage/inspector will sign the N.O.T portion of the UPDSE form, giving a copy to the owner and or responsible personal. It will be left up to them to mail their copy of the N.O.T to the DEQ for SWPPP termination.

## **PERMIT RENEWAL**

Each Operator is responsible for keeping up with his/her sites permit status. The Land Disturbing Permit may be renewed (except for Fill type) when the permittee realizes that he/she is not be able to complete work (stabilize the site) by the completion date listed in the Land Disturbing Permit application.

## **INSPECTOR CERTIFICATION**

Each City inspector to be certified.

Each contractor inspector to be certified.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – RECORD KEEPING

1. All hard copy records shall be kept in filing cabinets in the storm water manager's office unless otherwise noted.
2. All electronic records shall be kept on the storm water manager's computer unless otherwise noted.
3. All records will be kept for a period of five years unless otherwise noted or required in the Small MS4 General UPDES Permit.
4. All storm water management program updates will be noted in the appropriate section of the plan with hard copies of old management plans kept for a period of five years after updating.
5. Each file will be clearly marked as to what is included
6. **Minimum Control Measure 1 – Public Education and Outreach**
  - a. Save electronically the monthly educational material located on the City Web Site.
  - b. Save a hard copy of the flyers distributed with business license renewals.
  - c. Save a hard copy of the flyers distributed in utility bills.
  - d. Save a hard copy of the City newsletters that include information on storm water.

- e. Document attendance and financial support of Utah County Storm Water Coalition.
- f. Save a hard copy of Public education done by Utah County Coalition.
- g. Document all training activities for City employees.

**7. Minimum Control Measure 2 – Public Involvement/Participation**

- a. Save hard copy of all requests for input and all input from the Neighborhood Committees and Business Advisory Committee
- b. Save an electronic copy of all public hearing minutes.
- c. Document all training activities for City employees.

**8. Minimum Control Measure 3 – Illicit Discharge Detection and Elimination**

- a. A current map of the City storm Drain system will be maintained on the City's GIS system.
- b. The City's current storm drain ordinance will be kept by the City recorder and is available for review on the City web site.
- c. Save an electronic and hard copy of all illicit discharge reports from hotline or otherwise.
- d. Save an electronic and hard copy of all documentation on efforts to detect, trace, characterize, and cease illicit discharge.
- e. Save an electronic database of documented illicit discharges.
- f. Save an electronic and hard copy of field assessment of storm water outfalls.
- g. All public education efforts will be documented as part of minimum control measure 1.
- h. Save records on the amount and type of materials disposed of properly in the City's Household hazardous waste program.
- i. Document all training activities for City employees.

**9. Minimum Control Measure 4 – Construction Site Storm Water Runoff Control**

- a. Save separate electronic and hard copies files of all construction projects (both under and over one acre).



- i. These records will be maintained for a period of five years or until construction is completed, whichever is longer.
  - ii. Include all citations and or documentation of legal actions in each respective project file.
  - iii. Record will include construction SWPPP, NOI, Pre construction minutes, correspondence, inspection reports, final inspection notes, NOT, etc.
  - iv. Record will also include SWPPP review checklist.
- b. Document all training activities for City employees.

**10. Minimum Control Measure 5 – Long Term Storm Water Management**

- a. Save a hard copy of all Long Term Storm Water Management Plans. Transition to electronic copies as they become available.
- b. Maintain an electronic database of all long term storm water management plan holders.
- c. Maintain a database and hard copy of all executed maintenance agreements.
- d. Save an electronic and hard copy of all self-inspection reports for a period of five years.
- e. Save an electronic and hard copy of all City inspection reports for a period of five years.
- f. Save an electronic and hard copy of all enforcement actions.

**11. Minimum Control Measure 6 – Pollution Prevention and Good Housekeeping for Municipal Operations**

- a. All inspections of basins inlets, outfalls, weekly and quarterly high priority sites will be done electronically

12. Each file will be clearly marked as to what goes in each file and training will be given on recorded

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – LONG-TERM STORM WATER MANAGEMENT**

### **ORDINANCE ENFORCEMENT**

1. Review Post Construction SWPPP at final inspection of Construction Project.
  - a. Require completed and approved SWPPP prior to finalizing project.
  - b. Require signed and recorded maintenance agreement prior to finalizing project.
  - c. Verify updated contact person and information for long term monitoring.
  - d. Provide contact person with inspection report that they will submit each year.
  - e. Verify this information is documented.
  - f. Input information in long term inspection schedule.
2. Conduct yearly inspections and verification.
  - a. Within two months of annual report deadline, contact long term SWPP Plan holders reminding them of the requirement to inspect their facilities and submit an inspection report.
  - b. Annually contact long term SWPP Plan holders to schedule a site inspection by City Staff. (City to inspect every facilities at least once every five years for those who have executed a maintenance agreement and at least once every year for those who have not.)
  - c. Document deficiencies and direct facility to correct those deficiencies.
    - i. Deficiencies not resulting in illegal discharges to City storm drain shall be given a reasonable time to correct.
    - ii. Deficiencies resulting in illegal discharges to City storm drain shall be considered a level one violation and legal action will be initiated according to the attached escalating penalties.
  - d. Conduct follow up inspection to assess and document corrective actions.

- e. If actions are not initiated to correct deficiencies noted in yearly inspections, initiate legal actions.
  - f. Document all actions.
3. Legal action consists of the following escalating penalties.
- a. Deficiencies noted during inspections without actual illegal discharges to the City Storm Drain System, are considered Level I Violations or infractions subject to a \$0 Fine.
  - b. Inaction to correct deficiencies by the reasonable time determined, without actual illegal discharges to the City Storm Drain System, are considered Level I Violations or infractions subject to a \$100 Fine.
  - c. Each day after with no corrective action, without actual illegal discharges to the City Storm Drain System, is considered Level I Violation or infraction subject to a \$300 Fine.
  - d. If the situation is not corrected after a week it shall be elevated to a Level II Violation and follow the procedures listed below.
  - e. First day with illegal discharges to the City Storm Drain System is Level I Violation or infraction subject to a \$500 Fine.
  - f. Second day with illegal discharges to the City Storm Drain System is a Level II Violation or Class C misdemeanor and shall be punishable by a fine in a sum not to exceed seven hundred fifty dollars (\$750.00), or by imprisonment for a period not longer than ninety (90) days, or by both such fine and imprisonment.
  - g. Each additional day is an additional Class C misdemeanor until 7 days.
  - h. After 7 days it becomes a Level III Violation or Class B Misdemeanor and shall be punishable by a fine in a sum not to exceed one thousand dollars (\$1,000.00), or by imprisonment for a period not longer than six (6) Months, or by both such fine and imprisonment.
  - i. Each day additional day is an additional Class B misdemeanor.
  - j. When a person is convicted of a violation, any license previously issued to him by the City may be revoked by the court or by the governing body.
  - k. If, as the result of the violation of any provision of this chapter, the city or any other party suffers damages, fines, incurs investigative or clean up costs, or is required to make repairs and/or replace any materials, the cost of investigations, fines, repair or replacement shall be borne by the party in violation, in addition to any criminal fines and/or penalties.
  - l. No new licenses or permits shall be issued for a property with unresolved violations or penalties.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – LONG TERM STORM WATER MANAGEMENT

#### INSPECTION

1. Annually obtain self-inspection reports from entities that have entered into a maintenance agreement.
  - a. Review reports for deficiencies and follow up.
2. Inspect long term storm water management plan holders. Annually, unless they have entered into a maintenance agreement and then every 5 years if they have.
  - a. Contact plan holders and set inspection date.
  - b. Encourage plan holders to enter into a maintenance agreement and self-inspect.
  - c. Inspect site utilizing inspection form in Appendix E
3. Inspect 20 percent of commercial areas for illicit discharges as per control measure #3.
  - a. Note those commercial areas that are adversely affecting water quality.
  - b. Require these areas to develop a long term storm water management plan and enter into a maintenance agreement.
  - c. Add facility to inventory of long term storm water management plan holders.
4. Upon completion the permittee must verify that long-term BMP's were constructed as designed.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – FERTILIZER, PESTICIDE, AND HERBICIDE**

### **APPLICATION**

#### **1. General**

- Always follow the manufacturer's recommendations for mixing, application and disposal.
- Use manual and/or mechanical methods for weed/pest control and vegetation removal wherever possible rather than chemical methods. When chemicals are required, use the least toxic method to control animal and plant pests. Pheromone-based traps and sticky paper are often more effective than chemicals and are protective of water quality. Beneficial organisms should be promoted and protected whenever/wherever possible.
- When chemicals are used, use the most biodegradable product that will accomplish the desired goal.

#### **2. Mixing**

- Follow all manufacturers' recommendations for mixing, applying and handling of fertilizers, herbicides and pesticides.
- Mix fertilizers, herbicides or pesticides inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
- Label all containers.
- Always mix only the minimum amount of fertilizers, herbicides or pesticides that will be needed for the immediate job.
- If possible, use rinse water from cleaning of containers and application equipment as a dilution for the next batch.

#### **3. Application**

- Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and training of pesticide applicators ("Read the Label").

- Time the application of fertilizers, herbicides or pesticides to coincide with the manufacturer's recommendation for best results. (ex: Do not apply during a heavy rainfall or if a heavy rainfall is expected and do not apply immediately before an irrigation cycle.)
- If possible, avoid broadcast spraying of pesticides. Choose an appropriate method of application such that application does not exceed the problem area. (Fertilizer may be broadcast sprayed.)
- If possible, spot spray pesticides on infested areas whenever possible rather than treating a larger area. Do not use pesticides on a regular (preventive) basis. Apply only when there is an actual pest problem.
- Only use State recommended and approved chemicals around water features (ponds, lakes or streams).
- If possible, avoid applying fertilizers, herbicides or pesticides within 25 feet of any surface water or storm drainage structure.
- If possible use granular fertilizers, herbicides or pesticides whenever possible since they result in lower application losses.
- Avoid applying fertilizers, herbicides or pesticides in or near any drainage ditch, creek, pond or seasonal streambed.

#### **4. Clean-Up**

- Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and training of pesticide applicators ("Read the Label").
- Always follow all manufacturers' recommendations for cleaning-up and handling of fertilizers, herbicides or pesticides.
- Sweep pavements or sidewalks where fertilizers or other solid chemicals have fallen, sweep them back onto grassy areas.
- Clean up any spills or leaks of fertilizers, herbicides or pesticides promptly. Refer to the *Spill Clean-Up* BMP for more details.
- Make sure all containers are clearly labeled.
- Dispose of excess or leftover chemicals and empty expired fertilizers, herbicides or pesticides containers according to instructions on the label – preferably on the target pest or vegetated area.
- If possible use the triple rinsate from empty containers and/or rinsate from sprayer cleaning as dilution for the next batch.
- Never pour triple rinsate from empty containers and/or rinsate from sprayer cleaning onto ground or into any drainage system.
- Dispose of excess, expired or waste fertilizers, herbicides or pesticides properly. Try to use up the entire product on target areas. If not, dispose of the remaining product as hazardous waste.

#### **5. Storage**

- Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and training of pesticide applicators (“Read the Label”).
- Store fertilizers, herbicides or pesticides inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils.
- Chemicals and pesticides are stored at the Public Works Building. (This area should be indoors or have secondary containment so that spills or leaks will not contact soils.)
- All containers must be clearly and correctly labeled.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.
- Pesticide application must be done only under the supervision of a “certified pesticide applicator” or qualified supervisor.
- All employees who handle or apply pesticides or herbicides should be trained on the most recent Material Safety Data Sheet(s).
- Train employees on the proper methods for cleaning up spills or leaks of pesticides, herbicides and fertilizers. (Refer to the *Spill Clean-Up* BMP for more details.)

### **Record Keeping and Documentation**

1. Keep a list of all employees trained in the facility’s Stormwater Pollution Prevention Binder.
2. Records of pesticide application activities are kept at the Public Works Building.
3. An inventory of fertilizers, herbicides and pesticides including expiration dates are kept at the Public Works Building.
4. Copies of MSD sheets for all pesticides, fertilizers and other hazardous products are kept at the Public Works Building.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – SPILL PREVENTION AND REPORTING

#### 1. Spill Prevention - Materials and Waste Handling and Storage

- If possible, liquid or hazardous materials should be handled, used, stored, re-package and transferred indoors or under cover.
- Deliveries of bulk liquids should be supervised. Down gradient storm drain inlets should be covered during deliveries.
- Cover and contain containers, materials and wastes.
- Keep all containers closed unless adding or removing materials.

#### 2. Spill Kit Maintenance

- Spill kits are located at the following locations:  
\_\_\_\_\_
- (Name) \_\_\_\_\_ is responsible for spill kit(s) inventory and re-ordering supplies.
- Inspection of spill kit and re-supplying is done \_\_\_\_\_ x's/ \_\_\_\_\_ (month/year).

#### 3. Spill Clean Up and Storm Drain Protection

- Clean up minor spills immediately.
- Block any down gradient storm drains with berms, covers, absorbent socks or “pigs”.
- Never hose down spills or leaks.
- Always use “Dry Clean up Methods” for clean up of fuel spills (gas, diesel, motor oil or kerosene).
  - Spread absorbents (“kitty litter” or loose absorbents, sheets, pillows, pigs, or socks) on the spill.
  - Sweep up or pick up the absorbed materials.
  - Dispose of wastes properly.



- If fluids are leaking or have spilled on an impermeable surface, such as a roadway, locate nearest down gradient storm drain and dike or berm the drain to prevent fluids from entering it.
- Put down absorbent on the spill area.
- After clean up, be sure to sweep up the contaminated absorbent and remove the berm or dike at storm drain.
- If fluids are leaking or have spilled on a permeable surface, such as gravel, soil or grass, mark the area and report the spill to 801-785-2941.

#### 4. Reporting Spills

- Any spill or discharge of any pollutant (ex: oil, paints, fuels, hazardous liquids, sediment, or super-chlorinated water) that reaches storm drains or enters *Waters of the State*\* must be reported to the Division of Water Quality Emergency Spill Reporting line at 1-801-538-6146 or 1-801-536-4132 (off hours).
- If a spill or leak is of a hazardous substance that exceeds 1 pint or is of an unknown substance of any amount, call 911 and notify the Division of Water Quality's 24-hour emergency spill notification hotline at 1-801-536-4132, immediately.
- If the spill is more than 25 gallons of a petroleum product from a regulated storage tank or delivery truck or any amount that causes a sheen on nearby surface water, it must be reported to the Division of Water Quality at 1-801-536-4132
- For non-emergency spills, call 1-801-538-6146.
- Report spills to the facility supervisor (Name): \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_
- Report spills that reach storm drains or waterways to your city's Stormwater Coordinator (Name): Mark Atwood Phone (801)319-1331.

#### Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution and know whom to contact in case of spill.

#### Employee Training

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

#### Record Keeping and Documentation

1. Keep a Spill Response Plan on site. The plan is located at: \_\_\_\_\_ (Facility SWPPP or separate document).
2. Post signs as to whom to report spills to (Facility Supervisor, Stormwater Coordinator, Fire Department, PG Dispatch, etc.)
3. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location.

Keep copies of any correspondence with Division of Water Quality if the spill reaches “waters of the state”.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR CITY BUILDINGS AND FACILITIES

#### 1. Building and Landscape Maintenance

- Maintain the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines) on your property. Clean at least twice a year, late in the fall and in the spring. Inspect twice yearly clean As-needed
- Do not pressure wash or hose off surfaces with soap or chemicals unless wastewater is collected. Do not let wastewater enter storm drains.
- If only cleaning surfaces of ambient dust (with water only), the wastewater can be drained to nearby landscaped/vegetated areas or allowed to pool on-site and evaporate.
- Maintain sprinkler systems as to not over-irrigate. Avoid watering at rates that exceed the infiltration rate of the soil.
- Overflow drains from fountains or decorative ponds should be discharged to the sanitary sewer, drained to a vegetated area, or re-used for irrigation.
- If paving or sealing a roof, sidewalk or parking lot, prevent the sealant from reaching the gutters or drains. Use absorbent booms or pigs to protect storm drains.
- Stencil storm drains on your property with a caution message. *Example “No Dumping, Drains to waterways”*
- Always follow *Fertilizer, Herbicide, and Pesticide Application SOP*.

#### 2. Heat Transfer Equipment and HVAC Equipment Cleaning

- Do not allow cooling towers to discharge, leak, or mist-out into roof drains (if those drains empty onto pavement, streets or storm drains). Cooling towers should discharge to the sanitary sewer, if permitted by your local wastewater facility.
- Blow-down from utility boilers may not be discharged outside to pavement or to storm drains. Wastewater should be sent to the sanitary sewer.

### **3. Fire Suppression (Sprinkler) Systems**

- If possible, discharge water suppression systems (sprinklers) to sanitary sewer. New sprinkler system testing water must be de-chlorinated or sent to sanitary sewer.
- If water systems cannot be discharged to sanitary sewer, divert the wastewater to landscaped areas and minimize erosion.

### **4. Floor Drains and Elevator shaft Pumps**

- Ensure that elevator sump pumps, interior floor drains, and parking garage floor drains are plumbed to the sanitary sewer (not to storm drains).
- If there are any hydraulic fluid leaks from elevators, assure proper cleanup.

### **5. Janitorial Practices**

- Never dump mop water or cleaning wastewater outside, into parking lot or storm drains. Dispose of wastewater in mop sink or other sanitary sewer drain. (This also includes wastewater from automated floor or carpet cleaning equipment.)
- Do not pour, transfer or dispose of any material outdoors or near a storm drain.
- Store all chemicals indoors on an impervious floor.

### **6. Painting, Staining and Sandblasting**

- Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes.
- Enclose spray-painting operations with tarps or other means, as possible, to minimize wind drift and to contain overspray.
- Clean paintbrushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains. Never clean tools over a storm drain or outside.
- Brushes and tools used for oil-based paints, finishes, thinners, solvents or other materials must be cleaned over a tub or container and the cleaning wastes disposed or recycled at an approved hazardous waste facility. Never clean tools over a storm drain or outside.
- Promptly cleanup any spills of paints, cleaners or other maintenance chemicals or supplies. See *BMP: Spill Cleanup* for details.

### **7. Waste Management**

- All waste receptacles must be close-fitting lids or covers. This includes dumpsters and compactors.
- Keep all container lids closed at all times unless adding or removing material.
- If possible, Store waste receptacles (dumpsters) indoors, under a roof or roof overhang or inside a shed or covered structure.
- Sweep up around outdoor waste containers regularly.
- Do not hose-out dumpsters outdoors. Return dumpsters to the disposal company for cleaning at their facility. If dumpsters must be washed, do so in a wash bay or in an area where wastewater will drain to the sanitary sewer.
- Maintain and follow spill prevention plans.

## **8. Parking Lot Maintenance**

- Sweep Parking lots a minimum of twice a year. Once in the spring and fall with additional as needed.
- Always follow *Storm Water Pollutant Management for City Roads, Highways, and Parking Lots SOP*.

## **Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution and know whom to contact in case of spill.

## **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.
- Train all employees on the proper handling and disposal of chemicals and implementation of spill prevention plans.

## **Record Keeping and Documentation**

1. Keep a current inventory of all floor drains inside all permittee-owned or operated buildings.
2. Keep a current map of all storm drains located on the property of all permittee-owned or operated buildings and facilities.
3. Keep a current copy of spill prevention plans.
4. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention Binder.
5. Keep copies of all contracts for building services or other maintenance.
6. The Lead Storm Water Tech/Inspector is responsible for cleaning of storm drains, ditches or culverts.
7. Keep records of any routine cleaning of parking lots, storm drains or culverts.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR CITY MATERIAL STORAGE AREAS

#### 1. Outdoor Storage Areas

- If possible, store all containers indoors whenever possible. If they must be stored outdoors, place them in a shed or under a roof.
- All containers and dry materials should be covered or have secondary containment.
- Place all containers on a plastic pallet or other device that elevates them off the ground or pavement and provides containment. This avoids contact with storm water run-on/run-off
- If possible, place containers on paved, impervious surfaces and as far from (or at a lower elevation than) storm drain inlets and drainage ditches as possible.
- Provide a spill kit near storage areas. Clean up any spills, leaks or discharges promptly.
- Inspect all containers stored outdoors regularly
- If a container is found to be leaking either empty the contents into a leak-tight container or place entire leaking container inside of a larger leak-tight container. Clean up any spills or leaks promptly.
- Do not drain accumulated water from secondary containment structures unless approved by a supervisor.
- Inspect all containers stored outdoors regularly. Any containers that are leaking must be moved indoors immediately or placed in a leak-tight, “over-pack” container.

#### 2. Sand, Salt, Dirt or Gravel Stockpiles

- Cover sand/salt piles with a tarp or store inside a building or under a roof.
- Contain stormwater run-off from dirt and gravel stockpiles by using barriers or berms.

#### 3. Liquid Bulk Material Storage

- Provide impervious secondary containment for all Above Ground Storage Tanks (ASTs), except double-walled tanks, that is sufficient to contain the entire contents of the largest single tank plus an additional 4” of rainfall.
- Keep drain valves in secondary containment at ASTs locked in the closed position at all times. Open for draining only under supervision.
- Make sure an adequate spill kit with sufficient equipment and supplies is located near storage areas where spills are possible. Clean up any spills, leaks or discharges immediately.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

### **Record Keeping and Documentation**

1. Keep a list of all employees trained in the facility’s Stormwater Pollution Prevention binder.
2. Provide and document weekly visual inspections and quarterly comprehensive inspections.
3. Keep a map of the facility, including storm drain inlets, in the Stormwater Pollution Prevention Binder.
4. Keep copies of current MSDS’s for all materials stored outdoors.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
HEAVY EQUIPMENT STORAGE AREAS AND MAINTENANCE AREAS**

### **1. Vehicle and Equipment Maintenance**

- Move leaking vehicles or equipment indoors or under cover.
- Use drip pans for leaking vehicles that need to be stored outside.
- Contain leaking fluids and tag the vehicle to alert drivers that vehicle is non-operational.
- Perform all maintenance activities involving fluids indoors only (except in emergency cases).
- Dispose of wastewater from tire leak check appropriately (to sanitary sewer or interior drain).
- Clean all parts indoors using the appropriate parts washer.
- Wash vehicles in dedicated wash bays that drain to sanitary sewer.

### **2. Emergency Maintenance Operations**

- Use drip pans underneath vehicles to catch leaks and drips.
- Have spill kits on all response vehicles.
- Move vehicle to an impervious surface if possible (for better spill clean up).
- Notify your supervisor of spills. (See *SOP: Spill Prevention, Clean up and Reporting*)

### **3. Good Housekeeping and Waste Disposal**

- Clean up all spills promptly.
- Transfer fluids from drip pans to the appropriate waste containers immediately.
- Routinely check any equipment stored outside for leaks.
- Maintain oil/water separators according to municipal ordinance.
- Keep lids on dumpsters closed when not in use.
- Develop and maintain a maintenance schedule to check outdoor parking and storage areas for spills and or debris accumulation.



- Inspect parking and fueling areas daily. Designate employee(s) to perform these inspections.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in stormwater pollution prevention including how to recognize and report illegal connections or discharges.

### **Record Keeping and Documentation**

1. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location: \_\_\_\_\_.
2. Maintain a current copy of Spill Response Plan in SWPPP.
3. Maintain a map of storm drain locations on the property.
4. Keep a map, including location of storm drain inlets, in the facility's Stormwater Pollution Prevention Binder.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR CITY PARKS AND OPEN SPACE

#### 1. General

- Never dump any liquids or other materials outside. Dispose of all liquids and materials appropriately.
- Ensure the storm drain system (ditches, inlets, catch basins, drainage channels, or underground lines) on the property is properly maintained.
- Catch basins, inlets and culverts are scheduled to be cleaned once / year.) If additional cleaning or maintenance is needed notify: Public Works at: 801-785-1276
- Keep all outdoor work areas neat and tidy. Sweep around work areas after each shift and properly dispose of all wastes.
- If possible, do not hose down outdoor work areas or trash/waste container storage areas. If these areas must be washed, ensure that wash water will enter the sanitary sewer or a landscaped area. Do not use soap.

#### 2. Irrigation Systems

- Set sprinklers to water at rates less than the infiltration rate of the soil, to water evenly over the vegetated area, and to minimize the amount of water falling on impervious surfaces.
- Automatic timers should be used on all irrigation equipment to minimize run-off and over irrigation. Monitor soil moisture content and adjust timer settings appropriately.
- Always replace or repair broken or leaking sprinkler heads as soon as possible.
- To report an irrigation problem or concern contact: Parks Department at 801-785-7275.

#### 3. Landscaping, Lawn & Vegetation Maintenance

- Whenever possible, mulch-mow grasses.
- Sweep grass clippings and other vegetation debris from sidewalks or streets back on to grassy areas.

- Dispose of lawn clippings, leaves, tree trimmings, or other landscape waste appropriately. Grass clippings are taken to TSSD for disposal.
- If possible, dispose of organic wastes by composting. If composting is not possible, dispose of organic wastes at an approved disposal facility. Organic waste is composted at TSSD.
- If possible, control soil erosion by seeding, sod, mats, mulching, terracing or other effective methods. Use mulch or other erosion control methods to prevent erosion of exposed soils and flowerbeds.
- Do not apply bark or mulch on top of plastic sheeting unless the area is enclosed by a barrier-like lawn edging or it is far away from a storm drain inlet. Bark on plastic is easily washed off by heavy rainfall.
- If possible, design new or re-landscaped areas using xeriscape and Low Impact Development (LID) techniques to the maximum extent possible. Use hardy plant materials appropriate to the climate.
- Always follow the *Fertilizer, Herbicide and Pesticide Application SOP*.

#### **4. Buildings and Structures**

- Never discharge waste and/or wastewater from cleaning and repair of exterior surfaces into the Municipal Separate Storm Sewer System (MS4).
- Always follow the *Pressure Washing and Exterior Cleaning SOP* when power washing buildings or structures.
- Use inlet protection devices, such as rock wattles or drain covers, when constructing or repairing paved pathways or other structures to protect any storm drain inlets or ditches that are within 25 feet or are at the same or lower elevation than the work area.
- If possible, use rub-on techniques for graffiti removal or re-paint over the affected areas.
- Capture any wastewater, debris, solvent wastes or solid wastes from graffiti removal with tarps or wet vacs.

#### **5. Vehicle & Equipment Washing and Storage**

- Wash vehicles, equipment and mowers at: Public Works Shop, which drains to the sanitary sewer or an approved holding tank.
- Vehicles and mowers may also be washed at a commercial or other designated car washing facility.
- If possible, perform all maintenance and repair work inside shop. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.)
- Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
- Notify parks supervisor at Parks Office when leaving a leaking vehicle at Fleet Services or at your shop.

#### **6. Painting and Staining**

- Do not clean tools over a storm drain.
- Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes. Avoid performing activities near storm drains.

- Enclose spray-painting operations with tarps or other means to minimize wind drift and to contain overspray.
- Clean paintbrushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains.
- Clean brushes and tools used for oil-based paints, finishes, thinners, solvents or other materials over a tub or container and dispose of the cleaning wastes at an approved hazardous waste facility.
- Immediately clean up any spills of paints, cleaners or other maintenance chemicals or supplies.
- Store paints, stains and solvents inside, or under cover and with secondary containment (as per manufacturer's Recommendations).

### **7. Swimming Pool Maintenance**

- Do not discharge pool water to a street or storm drain when draining pools or hot tubs. Discharge water to vegetated landscape or the sanitary sewer.
- Never clean pool filters in the parking lot or near a storm drain.
- Do not hose down pool decks or sidewalks if the wash water will flow to pavement or the storm sewer system. Direct wash water to landscaped or grassy areas or to sanitary sewer.
- Store all pool chemicals indoors and under cover.
- Records to Recreation Manager and Parks Supervisor.

### **8. Waste Management**

- All waste receptacles must be close-fitting lids or covers. This includes dumpsters and compactors.
- Keep all container lids closed at all times unless adding or removing material.
- If possible, Store waste receptacles (dumpsters) indoors, under a roof or roof overhang or inside a shed or covered structure.
- Sweep up around outdoor waste containers regularly.
- Do not hose-out dumpsters outdoors. Return dumpsters to the disposal company for cleaning at their facility. If dumpsters must be washed, do so in a wash bay or in an area where wastewater will drain to the sanitary sewer.
- Post signs informing the public about the proper disposal of pet waste.
- Review yearly the adequacy of trash receptacles and adjust the amount and location accordingly.
- Remove trash on a weekly basis or more often as required.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

**Record Keeping and Documentation**

1. Keep a list of all employees trained in the department's Stormwater Pollution Prevention Binder.
2. Records of all maintenance activities are kept at: Parks Office.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
CITY VEHICLES AND EQUIPMENT

### 1. Vehicle and Equipment Maintenance

- Move leaking vehicles or equipment indoors or under cover.
- Use drip pans for leaking vehicles that need to be stored outside.
- Contain leaking fluids and tag the vehicle to alert drivers that vehicle is non-operational.
- Perform all maintenance activities involving fluids indoors only (except in emergency cases).
- Dispose of wastewater from tire leak check appropriately (to sanitary sewer or interior drain).
- Clean all parts indoors using the appropriate parts washer.
- Wash vehicles in dedicated wash bays that drain to sanitary sewer.

### 2. Emergency Maintenance Operations

- Use drip pans underneath vehicles to catch leaks and drips.
- Have spill kits on all response vehicles.
- Move vehicle to an impervious surface if possible (for better spill clean up).
- Notify your supervisor of spills. (See *SOP: Spill Prevention, Clean up and Reporting*)

### 3. Good Housekeeping and Waste Disposal

- Clean up all spills promptly.
- Transfer fluids from drip pans to the appropriate waste containers immediately.
- Routinely check any equipment stored outside for leaks.
- Maintain oil/water separators according to municipal ordinance.
- Keep lids on dumpsters closed when not in use.
- Develop and maintain a maintenance schedule to check outdoor parking and storage areas for spills and or debris accumulation.

- Inspect parking and fueling areas daily. Designate employee(s) to perform these inspections.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in stormwater pollution prevention including how to recognize and report illegal connections or discharges.

### **Record Keeping and Documentation**

1. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or other location: \_\_\_\_\_.
2. Maintain a current copy of Spill Response Plan in SWPPP. Maintain a map of storm drain locations on the property. This is located at: \_\_\_\_\_
3. Keep a map, including location of storm drain inlets, in the facility's Stormwater Pollution Prevention Binder.
4. Keep copies of any correspondence with CDPHE if the spill reaches "waters of the state".

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR STREET SWEEPING, SWEEPER CLEANING, AND WASTE DISPOSAL

#### 1. Operation of the Street Sweeper

- Operate all sweepers according to the manufacturer's recommended procedures.
- While sweeping, drive between \_\_\_\_\_ and \_\_\_\_\_ mph.
- Make sure brushes and water spray hoses are functional before leaving the shop.
- Fill the water tank daily or as needed.
- Replace brushes when bristle length is less than \_\_\_\_\_ inches.

#### 2. Sweeping Frequency (need to develop schedule)

<input type="checkbox"/> Streets should be swept according to an established schedule. The schedule is located at: _____	(Please fill out the Table, below, or place a copy of your schedule here.)	<b>Area</b>
<b>Actual Frequency</b>	<b>Main Arterials</b>	
<b>Commercial areas</b>		
<b>Industrial areas</b>		
<b>Downtown area</b>		
<b>Municipal Parking Lots</b>		
<b>Residential areas</b>		
<b>Hot Spots</b>		
<b>Seasonal Sweeping</b>		
<b>Winter Sand Removal</b>		
<b>Outdoor Special Events</b>		



- Have any “hotspot” areas been identified for extra sweeping? Where are they?  
 \_\_\_\_\_ How often are they swept? \_\_\_\_\_ x’s/  
 \_\_\_\_\_
- Sweep after outdoor special events (fairs, festivals and parades). Which events are identified?  
 \_\_\_\_\_

**3. Disposal of Sweeper Wastewater and Debris**

- Always decant sweeper wastewater into the sanitary sewer. Decant areas are located at: Pleasant Grove Public Works yard
- Dispose of debris at the designated, temporary, storage area. The debris storage areas should be on an impervious surface and enclosed area.
- The temporary storage area is located at: Pipe Plant Property
- Inspect and maintain the temporary storage area. Check area daily for run-on or run-off or debris scattering.
- Debris should be disposed of regularly or as needed.
- How often is debris disposed of? \_\_\_\_\_ x’s/ week \_\_\_\_\_ x’s/month other  
 \_\_\_\_\_
- The permanent disposal site is located at:  
 \_\_\_\_\_

**4. Cleaning the Sweeper**

- Scrape out left over debris from the hopper after the last dump of the day.
- Always wash sweepers in an area that drains to sanitary sewer.
- The wash area is located at:  
 \_\_\_\_\_.

**5. Other SOPs**

- Do not wash down any streets or curbs for routine cleaning.
- If spills or illegal discharges are seen report them immediately to the Public Works Department at 801-785-1276.

**Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

**Employee Training**

- All applicable employees should be trained in stormwater pollution prevention including how to recognize and report illegal connections or discharges.

**Record Keeping and Documentation**

1. Keep a street sweeping record and recorded in: Pleasant Grove City GIS system.

2. The number of tons disposed of per year is recorded in:

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(Facility SWPPP manual or separate document)

3. The number of miles driven per area or route is recorded in: Pleasant Grove City GIS system.
4. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR PARKING LOT MAINTENANCE

#### 1. General Maintenance

- Designate personnel to conduct inspections of parking facilities and stormwater conveyance systems on a regular basis.
- Clean leaves, trash, sand, and other debris from parking lots regularly or as needed to prevent debris from reaching any storm drain inlet or storm detention area.
- Sweep parking lots with a street sweeper regularly or as needed.
- The parking lots are inspected and evaluated for maintenance twice per year.
- Sweep after special events or construction projects.
- Sweep parking lots in the spring and after leaf season in the fall.
- Any automotive spills and/or drips must be cleaned up with dry clean-up methods (absorbents) and disposed of properly.
- Inspect all dumpster or waste disposal areas regularly. Clean up any trash, spills or leaks and report leaking dumpsters to the disposal company.

#### 2. Maintenance of Storm Drains, Culverts and Detention Areas

- Inspect storm structures, culverts, detention areas or structural BMPs regularly for debris accumulation. Clean out as needed.

#### 3. Paving, Re-surfacing and Concrete Projects

- Re-seal or pave on dry days when no rain is expected or stop paving activities well before rainfall.
- Pre-heat, transfer, or load hot asphalt far away from storm drain inlets.
- Protect or block nearby, downstream, storm drain inlets from debris from maintenance work (asphalt cap, chip sealing, concrete breaking, or saw cutting). Leave inlet protection in place until the job is complete.

- Clean up debris from around inlets and dispose of properly.
- Designate a “Concrete Wash Out Area” on the job site - in a grassy or graveled area where pooled water can soak into the ground.
- If no “Wash Out Area” is available, wash out into a container (pool, bucket or wheelbarrow) and dispose of material properly.

#### **4. Painting and Striping**

- Schedule painting, marking, and striping projects during dry weather only. Cease all activities when rain threatens.
- Use thermoplastic markings in place of paint whenever possible.
- Block nearby storm drain inlets (within 25 feet and down gradient of project).
- Promptly clean up any spills of paints, cleaners or other chemicals.

#### **5. Salt, Sand or Deicer Application**

- Hand-apply deicer or sidewalk salt. Use sparingly.
- If truck-applying salt, sand or liquid deicer, use the lowest application rate that will be effective. Ensure that the equipment is calibrated to optimum levels according to manufacturer’s instructions.

#### **6. Snow Plowing and Snow Storage**

- Do not plow, push, blow or store excess snow, deicer, or other debris into creeks, watercourses or storm drainage systems.
- If possible, store excess snow in a pervious area where melt water can infiltrate into the ground and not into the storm drain system.
- If snow storage is on a paved area, sweep up debris after snow melt.

#### **Contracts & Contractors**

- Contracts should include Stormwater Pollution Prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

#### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

#### **Record Keeping and Documentation**

1. Keep al log of maintenance records in at the Public Works Building.
2. Keep a log of all employees trained in facility’s Stormwater Pollution Prevention Binder.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR STREET AND ROAD MAINTENANCE AND REPAIR

#### 1. Storm Drain Protection

- Locate and block storm drain inlets (within 25 feet and/or down gradient from) during maintenance work such as concrete curb and gutter work, resurfacing, paving, striping/marketing, or saw cutting.
- Place covers, rock wattles, sand bags, or filter fabric around inlets to protect them from entry of wastes, dusts, overspray or slurry.
- Inspect site at the beginning of the day and end to ensure operations are not contributing sediment or other pollutants to the flow line or storm drain.
- Clean right of ways (roadways) with brooms or street sweepers – as needed.

#### 2. Concrete Work

- When saw cutting concrete, use the minimum amount of water. Let the waste slurry dry and then sweep it up before leaving the location. A wet vacuum may also be used to pick up the waste slurry immediately after cutting is complete. Do not allow slurry to reach storm drains.
- Designate a “Concrete Wash Out Area” that is as far as possible from any surface waters, storm drain inlets or drainage ditches and is located in a low area where wash water will pool and soak into the ground.
- Concrete trucks must washout in the wash out area or into a container such as a kiddie pool or wheelbarrow.
- Maintain the wash out area, inspect it for clean out needs, and check for run-on and run-off.
- The debris from the wash out area must be taken to a permanent disposal site when the washout is full and when the project is complete.

### **3. Erosion Control and Storage of Materials**

- Cover and contain all liquid and solid materials to prevent run off.
- Avoid storing piles of materials (soil, sand, gravel) in street, near storm drains or gutters. If dirt piles must be stored in the street, they must have berms or wattles surrounding them to prevent run-off. Rock wattles should be placed around all down gradient storm drains to prevent sediment from reaching the inlets
- Excavated material should be placed on the uphill side of trenches to minimize sediment run-off.
- Control erosion to the maximum extent possible.
- Inspect and maintain all erosion or sediment control devices or equipment installed in erosion-prone areas in road construction projects as per the Stormwater Management Plan (SWMP).
- Ensure that projects over 1 acre have the proper Utah Stormwater Discharge Permits and refer to the Stormwater Management Plan.

### **4. Painting and Striping**

- Schedule painting, marking, and striping projects during dry weather only. Cease all activities when rain threatens.
- Use thermoplastic markings in place of paint whenever feasible.
- Block nearby storm drain inlets (within 25 feet and/or down gradient of project).
- Promptly clean up any spills of paints, cleaners or other chemicals.

### **5. Re-surfacing or Paving**

- Re-seal or pave only on dry days when no rain is expected. Cease all activities when rain threatens
- If possible, transfer, store, pre-heat and load hot asphalt far away from storm drain inlets.
- Protect or block downstream storm drain inlets (within 25 feet) from debris from maintenance work (asphalt cap, chip sealing, concrete breaking, or saw cutting). Leave covers or berms in place until the job is complete

### **6. Bridge Repair Work**

- When working on bridges, transport and store paint and materials in containers with secure lids.
- Do not transfer, store or load paint on a bridge.
- Capture waste, scraps, rust or paint from sanding or painting projects. It may be necessary to suspend nets or tarps below the bridge to catch falling debris. If sanding or sand blasting, use a vacuum bag attachment.

### **Contracts & Contractors**

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention: including how to recognize and report illegal connections or discharges.

### **Record Keeping and Documentation**

1. If the site is over an acre, obtain the proper Utah Discharge permit; prepare and use a Stormwater Management Plan (SWMP) and keep copies of all inspection logs.
2. Keep a list of all employees trained in Stormwater Pollution Prevention.
3. Keep copies of MSD Sheets of all products used.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR CITY STORM WATER COLLECTION AND CONVEYANCE SYSTEM

#### 1. Stormwater System Inspection and Maintenance (need Schedule including priority areas)

- Stormwater system should be inspected for structural integrity and evidence of illicit discharge and maintained according to an established schedule including inlets, lines, manholes, ditches, detention ponds and permanent BMP's.
- Report any areas needing attention and schedule repairs ASAP.
- Keep records of "hot spot" areas here or note where information is stored:
  - \_\_\_\_\_  
Where are they located?
  - \_\_\_\_\_ x's/  
\_\_\_\_\_ (year).
  - Time of year: \_\_\_\_\_
- Inspections should be used to help determine cleaning schedule for stormwater systems (ex. runs prone to fast sediment accumulation, confirmed contamination).
- Stormwater system should be cleaned according to an established schedule, including detention ponds and permanent BMPs. This schedule is located:  
\_\_\_\_\_.
- Ensure water from jetting and flushing inlets and lines is not discharged into the storm system. Use a Vactor truck to vacuum up flush water downstream while jetting and flushing inlets and lines.

#### 2. Reporting

- Report any suspected illegal connections or dumping to the Public Works Department at 801-785-1276.



### 3. Decanting Wastewater from Vac Trucks and Sweepers

- Always decant Vac trucks and sweepers into the sanitary sewer.
- Decant areas are located at the Public Works Department washout pad

### 4. Debris Storage Areas and Disposal

- Dispose of debris at the designated, temporary, storage area.
- The temporary storage area is located at the 220 South Smith property.
- Always inspect and maintain the temporary storage area. Check area for run-on or run-off or debris scattering.
- Debris should be removed and taken to the permanent disposal site regularly.
- The permanent disposal site is at the Utah County Solid Waste Transfer Station for contaminated wastes. Un-contaminated fill material to be disposed of in various fill sites as available.

### 5. Ditches and Detention Ponds

- Inspect ditches for signs of erosion while mowing drainage ditches.
- Track ditches prone to erosion and set maintenance schedule accordingly.
- Do not apply pesticides or fertilizers in drainage ditches, on roadways or curbs.
- Do not disturb waterways, wetlands or sensitive wildlife habitat without permits from Army Corps of Engineers.

### Contracts & Contractors

- Contracts should include stormwater pollution prevention language.
- Ensure that contractors implement proper Best Management Practices (BMPs) to prevent stormwater pollution.

### Employee Training

- All applicable employees should be trained in stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

### Record Keeping and Documentation

1. Keep a written Storm Drain System Inspection and Maintenance Schedule. This is recorded in:  
\_\_\_\_\_.
2. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder (or other location: \_\_\_\_\_).
3. Debris removal totals are kept at:  
\_\_\_\_\_.
4. The inventory of hot spot areas where contamination has been confirmed and require frequent inspections is recorded in  
\_\_\_\_\_.
5. Records of any testing done on debris removed from catch basins is located  
\_\_\_\_\_.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
“HIGH PRIORITY” PIPE PLANT PROPERTY MATERIAL STAGING AREA**

### **1. Outdoor Storage Areas**

- If possible, store all containers indoors whenever possible. If they must be stored outdoors, place them in a shed or under a roof.
- All containers and dry materials should be covered or have secondary containment.
- Place all containers on a plastic pallet or other device that elevates them off the ground or pavement and provides containment. This avoids contact with storm water run-on/run-off
- If possible, place containers on paved, impervious surfaces and as far from (or at a lower elevation than) storm drain inlets and drainage ditches as possible.
- Provide a spill kit near storage areas. Clean up any spills, leaks or discharges promptly.
- Do not drain accumulated water from secondary containment structures unless approved by a supervisor.
- Do not store vac-truck or sweeper truck material on site unless it has first been decanted into the sanitary sewer.

### **2. Sand, Salt, Dirt or Gravel Stockpiles**

- Cover sand/salt piles with a tarp or store inside a building or under a roof.
- Contain stormwater run-off from dirt and gravel stockpiles by using barriers or berms.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

### **Inspections**

- Perform weekly visual inspection.
- Look for evidence of spills and immediately clean them up.

- Perform quarterly comprehensive inspections.
- Inspect the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines).
- Special attention to be paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant generating areas.
- Perform quarterly visual observation of storm water discharge.
- Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied.

#### **Record Keeping and Documentation**

1. Keep a list of all employees trained in Stormwater Pollution Prevention.
2. Keep copies of all contracts for building services or other maintenance.
3. Log inspections and keep records with SWMP document. Include any identified deficiencies and corrective actions taken.
4. Keep copies of current MSDS's for all materials stored outdoors.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
“HIGH PRIORITY” CEMETERY**

### **1. General**

- Never dump any liquids or other materials outside. Dispose of all liquids and materials appropriately.
- Ensure the storm drain system (ditches, inlets, catch basins, drainage channels, or underground lines) on the property is properly maintained.
- Catch basins, inlets and culverts are scheduled to be cleaned once / year.) If additional cleaning or maintenance is needed notify: Public Works at: 801-785-1276
- Keep all outdoor work areas neat and tidy. Sweep around work areas after each shift and properly dispose of all wastes.
- If possible, do not hose down outdoor work areas or trash/waste container storage areas. If these areas must be washed, ensure that wash water will enter the sanitary sewer or a landscaped area. Do not use soap.

### **2. Irrigation Systems**

- Set sprinklers to water at rates less than the infiltration rate of the soil, to water evenly over the vegetated area, and to minimize the amount of water falling on impervious surfaces.
- Automatic timers should be used on all irrigation equipment to minimize run-off and over irrigation. Monitor soil moisture content and adjust timer settings appropriately.
- Always replace or repair broken or leaking sprinkler heads as soon as possible.
- To report an irrigation problem or concern contact: Parks Department at 801-785-7275.

### **3. Landscaping, Lawn & Vegetation Maintenance**

- Whenever possible, mulch-mow grasses.

- Sweep grass clippings and other vegetation debris from sidewalks or streets back on to grassy areas.
- Dispose of lawn clippings, leaves, tree trimmings, or other landscape waste appropriately. Grass clippings are stored at the Cemetery or taken to TSSD for disposal.
- If possible, dispose of organic wastes by composting. If composting is not possible, dispose of organic wastes at an approved disposal facility. Organic waste is composted at TSSD.
- If possible, control soil erosion by seeding, sod, mats, mulching, terracing or other effective methods. Use mulch or other erosion control methods to prevent erosion of exposed soils and flowerbeds.
- Do not apply bark or mulch on top of plastic sheeting unless the area is enclosed by a barrier-like lawn edging or it is far away from a storm drain inlet. Bark on plastic is easily washed off by heavy rainfall.
- If possible, design new or re-landscaped areas using xeriscape and Low Impact Development (LID) techniques to the maximum extent possible. Use hardy plant materials appropriate to the climate.
- Always follow the *Fertilizer, Herbicide and Pesticide Application SOP*.

## **2. Buildings and Structures**

- Never discharge waste and/or wastewater from cleaning and repair of exterior surfaces into the Municipal Separate Storm Sewer System (MS4).
- Use inlet protection devices, such as rock wattles or drain covers, when constructing or repairing paved pathways or other structures to protect any storm drain inlets or ditches that are within 25 feet or are at the same or lower elevation than the work area.
- If possible, use rub-on techniques for graffiti removal or re-paint over the affected areas.
- Capture any wastewater, debris, solvent wastes or solid wastes from graffiti removal with tarps or wet vacs.

## **3. Vehicle & Equipment Washing and Storage**

- Wash vehicles, equipment and mowers at: Public Works Department washout pad, which drains to the sanitary sewer.
- Vehicles and mowers may also be washed at a commercial or other designated car washing facility.
- If possible, perform all maintenance and repair work inside shop. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.
- Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
- Follow *Vehicle and Equipment Cleaning BMP*.

## **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

## **Inspections**

- Perform weekly visual inspection.
- Look for evidence of spills and immediately clean them up.
- Perform quarterly comprehensive inspections.
- Inspect the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines).
- Special attention to be paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant generating areas.
- Perform quarterly visual observation of storm water discharge.
- Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied.

### **Record Keeping and Documentation**

5. Keep a list of all employees trained in Stormwater Pollution Prevention.
6. Keep copies of all contracts for building services or other maintenance.
7. Log inspections and keep records with SWMP document. Include any identified deficiencies and corrective actions taken.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
“HIGH PRIORITY” RODEO GROUNDS**

### **1. General**

- Never dump any liquids or other materials outside. Dispose of all liquids and materials appropriately.
- Maintain the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines) on your property. Inspect twice yearly clean as-needed
- Keep all outdoor work areas neat and tidy. Sweep around work areas after each shift and properly dispose of all wastes.
- Remove animal wastes and trash immediately after rodeos and other public activities at the site. Remove animal wastes regularly at other times of the year.
- If possible, do not hose down outdoor work areas or trash/waste container storage areas. If these areas must be washed, ensure that wash water will enter the sanitary sewer or a landscaped area. Do not use soap.
- Maintain bermed areas to eliminate storm water runoff from the site.

### **2. Buildings and Structures**

- Never discharge waste and/or wastewater from cleaning and repair of exterior surfaces into the Municipal Separate Storm Sewer System (MS4).
- Use inlet protection devices, such as rock wattles or drain covers, when constructing or repairing paved pathways or other structures to protect any storm drain inlets or ditches that are within 25 feet or are at the same or lower elevation than the work area.
- If possible, use rub-on techniques for graffiti removal or re-paint over the affected areas.
- Capture any wastewater, debris, solvent wastes or solid wastes from graffiti removal with tarps or wet vacs.

### **3. Vehicle & Equipment Washing and Storage**

- Wash vehicles, equipment and mowers at: Public Works Department washout pad, which drains to the sanitary sewer.
- Vehicles and mowers may also be washed at a commercial or other designated car washing facility.
- If possible, perform all maintenance and repair work inside shop. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.
- Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
- Follow *Vehicle and Equipment Cleaning* BMP.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

### **Inspections**

- Perform weekly visual inspection.
- Look for evidence of spills and immediately clean them up.
- Perform quarterly comprehensive inspections.
- Inspect the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines).
- Special attention to be paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant generating areas.
- Perform quarterly visual observation of storm water discharge.
- Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied.

### **Record Keeping and Documentation**

8. Keep a list of all employees trained in Stormwater Pollution Prevention.
9. Keep copies of all contracts for building services or other maintenance.
10. Log inspections and keep records with SWMP document. Include any identified deficiencies and corrective actions taken.



# Pleasant Grove



Utah's City of Trees

## **Storm Water Management Plan**

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# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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STANDARD OPERATING PROCEDURE (SOP) – STORM WATER POLLUTANT MANAGEMENT FOR  
“HIGH PRIORITY” PUBLIC WORKS YARD

### 1. Building and Landscape Maintenance

- Maintain the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines) on your property.
- Do not pressure wash or hose off surfaces with soap or chemicals unless wastewater is collected. Do not let wastewater enter storm drains.
- If only cleaning surfaces of ambient dust (with water only), the wastewater can be drained to nearby landscaped/vegetated areas or allowed to pool on-site and evaporate.

### 2. Janitorial Practices

- Never dump mop water or cleaning wastewater outside, into parking lot or storm drains. Dispose of wastewater in mop sink or other sanitary sewer drain. (This also includes wastewater from automated floor or carpet cleaning equipment.)
- Do not pour, transfer or dispose of any material outdoors or near a storm drain.

### 3. Painting, Staining and Sandblasting

- Use a ground cloth or oversized tub for paint mixing and tool cleaning. Properly dispose of the wastes.
- Enclose spray-painting operations with tarps or other means, as possible, to minimize wind drift and to contain overspray.
- Clean paintbrushes and tools used to apply water-based paints in sinks plumbed to a sanitary sewer or in portable containers that can be emptied into sanitary sewer drains. Never clean tools over a storm drain or outside.
- Brushes and tools used for oil-based paints, finishes, thinners, solvents or other materials must be cleaned over a tub or container and the cleaning wastes disposed or recycled at an approved hazardous waste facility. Never clean tools over a storm drain or outside.

- Promptly cleanup any spills of paints, cleaners or other maintenance chemicals or supplies. See *BMP: Spill Cleanup* for details.
- When sand blasting exterior surfaces, place tarps or ground cloths beneath the work area to capture sand blasting media and debris. Enclose the sand blasting area with tarps or plastic to protect from wind and to capture airborne particles (dust).
- Cease all sand blasting operations on windy days.

#### **4. Waste Management**

- All waste receptacles must be close-fitting lids or covers. This includes dumpsters and compactors.
- Keep all container lids closed at all times unless adding or removing material.
- If possible, Store waste receptacles (dumpsters) indoors, under a roof or roof overhang or inside a shed or covered structure.
- Sweep up around outdoor waste containers regularly.
- Do not hose-out dumpsters outdoors. Return dumpsters to the disposal company for cleaning at their facility. If dumpsters must be washed, do so in a wash bay or in an area where wastewater will drain to the sanitary sewer.

#### **5. Vehicle & Equipment Washing and Storage**

- Wash vehicles, equipment and mowers at: Public Works Department washout pad, which drains to the sanitary sewer.
- Vehicles and mowers may also be washed at a commercial or other designated car washing facility.
- If possible, perform all maintenance and repair work inside shop. (Only emergency repairs and maintenance activities that do not involve fluids may be performed outdoors.
- Do not store leaking vehicles or equipment outdoors. Contain the leak, repair immediately, or move indoors and repair.
- Follow *Vehicle and Equipment Cleaning* BMP.

#### **6. Outdoor Storage Areas**

- If possible, store all containers indoors whenever possible. If they must be stored outdoors, place them in a shed or under a roof.
- All containers and dry materials should be covered or have secondary containment.
- Place all containers on a plastic pallet or other device that elevates them off the ground or pavement and provides containment. This avoids contact with storm water run-on/run-off
- If possible, place containers on paved, impervious surfaces and as far from (or at a lower elevation than) storm drain inlets and drainage ditches as possible.
- Provide a spill kit near storage areas. Clean up any spills, leaks or discharges promptly.
- Inspect all containers stored outdoors regularly
- If a container is found to be leaking either empty the contents into a leak-tight container or place entire leaking container inside of a larger leak-tight container. Clean up any spills or leaks promptly.
- Do not drain accumulated water from secondary containment structures unless approved by a supervisor.

- Inspect all containers stored outdoors regularly. Any containers that are leaking must be moved indoors immediately or placed in a leak-tight, “over-pack” container.

### **7. Sand, Salt, Dirt or Gravel Stockpiles**

- Cover sand/salt piles with a tarp or store inside a building or under a roof.
- Contain stormwater run-off from dirt and gravel stockpiles by using barriers or berms.

### **Employee Training**

- All applicable employees should be trained in general stormwater pollution prevention; including how to recognize and report illegal connections or discharges.

### **Inspections**

- Perform weekly visual inspection.
- Look for evidence of spills and immediately clean them up.
- Perform quarterly comprehensive inspections.
- Inspect the storm drain system (ditches, inlets, catch basins, culverts, drainage channels, or underground lines).
- Special attention to be paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant generating areas.
- Perform quarterly visual observation of storm water discharge.
- Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied.

### **Record Keeping and Documentation**

1. Keep a list of all employees trained in Stormwater Pollution Prevention.
2. Keep copies of all contracts for building services or other maintenance.
3. Log inspections and keep records with SWMP document. Include any identified deficiencies and corrective actions taken.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### **APPENDIX E - STANDARD FORMS AND CHECKLISTS**

Outfall Reconnaissance Inventory Form

Illicit Discharge Hotline Incident Tracking Form

Construction Storm Water Inspection Form

Public Comment Form

Long Term Storm Water Management Inspection Report

Detention Basin Inspection Form

High Priority Quarterly Comprehensive Inspection Form

High Priority Quarterly Discharge Inspection Form

High Priority Weekly Inspection Form

# OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

## Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.):	Last 24 hours:	Last 48 hours:
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial		<input type="checkbox"/> Open Space	
<input type="checkbox"/> Ultra-Urban Residential		<input type="checkbox"/> Institutional	
<input type="checkbox"/> Suburban Residential		Other: _____	
<input type="checkbox"/> Commercial		Known Industries: _____	
Notes (e.g., origin of outfall, if known):			

## Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter/Dimensions: _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully  With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> rip-rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth:  Top Width:  Bottom Width:	
<input type="checkbox"/> In-Stream	(applicable when collecting samples)			
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No		<i>If No, Skip to Section 5</i>	
Flow Description (If present)	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial			

## Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER	RESULT	UNIT	EQUIPMENT	
<input type="checkbox"/> Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
<input type="checkbox"/> Flow #2	Flow depth		In	Tape measure
	Flow width	' "	Ft, In	Tape measure
	Measured length	' "	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature		°F	Thermometer	
pH		pH Units	Test strip/Probe	
Ammonia		mg/L	Test strip	

## Outfall Reconnaissance Inventory Field Sheet

### Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow?  Yes  No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint colors in sample bottle	<input type="checkbox"/> 2 – Clearly visible in sample bottle	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Turbidity	<input type="checkbox"/>	See severity	<input type="checkbox"/> 1 – Slight cloudiness	<input type="checkbox"/> 2 – Cloudy	<input type="checkbox"/> 3 – Opaque
Floatables -Does Not Include Trash!!	<input type="checkbox"/>	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible suds or oil sheen)	<input type="checkbox"/> 3 – Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

### Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present?  Yes  No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion	
Deposits/Stains	<input type="checkbox"/>	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/>	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/>	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other:	

### Section 6: Overall Outfall Characterization

Unlikely   
  Potential (presence of two or more indicators)   
  Suspect (one or more indicators with a severity of 3)   
  Obvious

### Section 7: Data Collection

1. Sample for the lab?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. If yes, collected from:	<input type="checkbox"/> Flow	<input type="checkbox"/> Pool
3. Intermittent flow trap set?	<input type="checkbox"/> Yes	<input type="checkbox"/> No    If Yes, type: <input type="checkbox"/> OBM <input type="checkbox"/> Caulk dam

### Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

## OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

### Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.):	Last 24 hours:	Last 48 hours:
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial		<input type="checkbox"/> Open Space	
<input type="checkbox"/> Ultra-Urban Residential		<input type="checkbox"/> Institutional	
<input type="checkbox"/> Suburban Residential		Other: _____	
<input type="checkbox"/> Commercial		Known Industries: _____	
Notes (e.g., origin of outfall, if known):			

### Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter/Dimensions: _____	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully  With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> rip-rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth:  Top Width:  Bottom Width:	
<input type="checkbox"/> In-Stream	(applicable when collecting samples)			
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>If No, Skip to Section 5</i>			
Flow Description (If present)	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial			

### Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER	RESULT	UNIT	EQUIPMENT	
<input type="checkbox"/> Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
<input type="checkbox"/> Flow #2	Flow depth		In	Tape measure
	Flow width	' "	Ft, In	Tape measure
	Measured length	' "	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature		°F	Thermometer	
pH		pH Units	Test strip/Probe	
Ammonia		mg/L	Test strip	



## Outfall Reconnaissance Inventory Field Sheet

### Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow?  Yes  No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint colors in sample bottle	<input type="checkbox"/> 2 – Clearly visible in sample bottle	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Turbidity	<input type="checkbox"/>	See severity	<input type="checkbox"/> 1 – Slight cloudiness	<input type="checkbox"/> 2 – Cloudy	<input type="checkbox"/> 3 – Opaque
Floatables -Does Not Include Trash!!	<input type="checkbox"/>	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible suds or oil sheen)	<input type="checkbox"/> 3 – Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

### Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present?  Yes  No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion	
Deposits/Stains	<input type="checkbox"/>	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/>	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/>	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other:	

### Section 6: Overall Outfall Characterization

Unlikely   
  Potential (presence of two or more indicators)   
  Suspect (one or more indicators with a severity of 3)   
  Obvious

### Section 7: Data Collection

1. Sample for the lab?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. If yes, collected from:	<input type="checkbox"/> Flow	<input type="checkbox"/> Pool
3. Intermittent flow trap set?	<input type="checkbox"/> Yes	<input type="checkbox"/> No    If Yes, type: <input type="checkbox"/> OBM <input type="checkbox"/> Caulk dam

### Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

## Illicit Discharge Hotline Incident Tracking Sheet

<b>Incident ID:</b>				
<b>Responder Information</b>				
Call taken by:			Call date:	
Call time:			Precipitation (inches) in past 24-48 hrs:	
<b>Reporter Information</b>				
Incident time:			Incident date:	
Caller contact information ( <i>optional</i> ):				
<b>Incident Location</b> ( <i>complete one or more below</i> )				
Latitude and longitude:				
Stream address or outfall #:				
Closest street address:				
Nearby landmark:				
<b>Primary Location Description</b>		<b>Secondary Location Description:</b>		
<input type="checkbox"/> Stream corridor ( <i>In or adjacent to stream</i> )		<input type="checkbox"/> Outfall	<input type="checkbox"/> In-stream flow	<input type="checkbox"/> Along banks
<input type="checkbox"/> Upland area ( <i>Land not adjacent to stream</i> )		<input type="checkbox"/> Near storm drain	<input type="checkbox"/> Near other water source (storm water pond, wetland, etc.):	
Narrative description of location:				
<b>Upland Problem Indicator Description</b>				
<input type="checkbox"/> Dumping		<input type="checkbox"/> Oil/solvents/chemicals	<input type="checkbox"/> Sewage	
<input type="checkbox"/> Wash water, suds, etc.		<input type="checkbox"/> Other: _____		
<b>Stream Corridor Problem Indicator Description</b>				
Odor	<input type="checkbox"/> None	<input type="checkbox"/> Sewage	<input type="checkbox"/> Rancid/Sour	<input type="checkbox"/> Petroleum (gas)
	<input type="checkbox"/> Sulfide (rotten eggs); natural gas	<input type="checkbox"/> Other: Describe in "Narrative" section		
Appearance	<input type="checkbox"/> "Normal"	<input type="checkbox"/> Oil sheen	<input type="checkbox"/> Cloudy	<input type="checkbox"/> Suds
	<input type="checkbox"/> Other: Describe in "Narrative" section			
Floatables	<input type="checkbox"/> None:	<input type="checkbox"/> Sewage (toilet paper, etc)	<input type="checkbox"/> Algae	<input type="checkbox"/> Dead fish
	<input type="checkbox"/> Other: Describe in "Narrative" section			
Narrative description of problem indicators:				
Suspected Violator (name, personal or vehicle description, license plate #, etc.):				

### Investigation Notes

Initial investigation date:

Investigators:

No investigation made

Reason:

Referred to different department/agency:

Department/Agency:

Investigated: No action necessary

Investigated: Requires action

Description of actions:

Hours between call and investigation:

Hours to close incident:

Date case closed:

Notes:



# UPDES STORM WATER INSPECTION EVALUATION FORM FOR SWPPP COMPLIANCE

Insert City Logo  
Here

## BACKGROUND INFORMATION

Site Name:		UPDES Permit #:
Site Address:		
Local Jurisdiction or County:		
Permit Effective Date:	Permit Expiration Date:	
Total Project Area:	Total Disturbed Area:	
Project Type: (circle) <i>Subdivision</i> <i>Commercial</i> <i>Industrial</i> <i>Linear (Road/Pipe/Power)</i> <i>Land Disturbance</i>		

## OPERATOR CONTACT INFORMATION

	NAMES	PHONE NUMBERS	E-MAIL
Operator:			
Onsite Facility Contact:			
Important Contacts:			
Important Contacts:			

SWPPP PRE-SITE REVIEW INFORMATION	YES	NO	SWPPP PRE-SITE REVIEW INFORMATION	YES	NO
1. Has a pre-construction review of the SWPPP been conducted by the applicable jurisdiction, if required?			6. Does the SWPPP contain the site description, sequence of construction activities, and areas of the site to be disturbed?		
2. Are the required post-construction elements included in the SWPPP? (i.e. grass swales, detention basins, etc.)			7. Does the SWPPP contain locations of storm drains, surface drainage patterns, and locations of storm water discharges?		
3. Are contact names and telephone numbers listed in the SWPPP?			8. Does the SWPPP and/or site map address waste control & disposal, off site tracking, sanitary concerns, exposure to construction materials, lay down or storage areas, administrative trailers, etc.?		
4. Are the NOI and State permit in the SWPPP?			9. Does the SWPPP include the site map, sediment, and erosion control design drawings, showing both structural and non structural BMPs?		
5. Did the "Operator" sign the SWPPP with authorization and certification statements?					

## NOTICE OF TERMINATION (NOT) INSPECTION

Site Name:	Date of Evaluation:
Site Address:	
Inspected By:	Title/Organization:

	YES	NO	Comments:
1. Has the site been properly stabilized according to permit requirements?			
2. Have all temporary BMPs been removed?			
3. Have post-construction (permanent storm water system) elements been constructed and inspected in accordance with approved project drawings?			
4. Is the site acceptably clean?			

Inspector: 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: \_\_\_\_\_  

(Print Name)
(Title)
(Signature)
(Date)

Operator: \_\_\_\_\_  

(Print Name)
(Title)
(Signature)
(Date)

**(Attach additional sheets of narrative, pictures and checklists, as necessary)**



# SWPPP COMPLIANCE INSPECTION FORM

Insert City Logo  
Here

Project Name:		Address:		Date:			
Owner:		Contractor: Gen/Sub		Start time:			
Site Contact:		Phone:		Stop time:			
UPDES Permit #:		Expiration:		Weather: Sunny Cloudy Raining Snowing Other:			
Date of last rain event:		Duration:		Approx. Rainfall (in):			
Inspected By (Print):		Local Jurisdiction or County:					
Reason for Inspection:		Scheduled Complaint/Tip Random		Receiving Waters:			
BMP/HOUSEKEEPING INFORMATION		YES	NO	BMP/HOUSEKEEPING INFORMATION		YES	NO
1. Are the SWPPP, NOI, and permit on site and accessible?				14. Are BMPs properly located, including inlet protection BMPs?			
2. Are off-site flows entering the construction site?				15. Are wind erosion controls in place?			
3. Are sediment & erosion control BMP's installed on the site as shown in the SWPPP, or on the site map if req'd? (BMPs that are no longer necessary should be crossed out and dated, new BMPs drawn in and dated.)				16. Does repair/maintenance of existing sediment and erosion control BMPs need to occur?			
4. Does your site evaluation indicate a need to update and document the SWPPP report and accompanying sediment and erosion control drawings within the next seven (7) days?				17. Are soil, construction material, landscaping items, or other debris evident on the street?			
5. Are on-site inspection reports in the SWPPP? (Inspections are to be performed <i>bi-weekly</i> and <i>within 24 hours</i> after a measurable weather event, and/or as required by the SWPPP)				18. Have all on-site corrective action items from previous inspections been addressed and documented within the time frame allotted by the inspector?			
6. Are updated BMP submittals in the SWPPP? (specifications and engineering for BMPs, both structural and non-structural)				19. Are there locations where additional BMPs should be installed or removed that are not identified in the SWPPP?			
7. Is trash and debris cleanup being performed? (goodhousekeeping)				20. Are all exits to public roads maintained to limit track-out?			
8. Are construction products, chemicals, and supplies properly managed and contained?				21. Is there evidence of sediment discharge such as mud flows or soil deposits from the construction site to downstream locations?			
9. Is fuel storage properly located and maintained?				22. Is there evidence of vehicles tracking sediment (mud-tracking) off the construction site onto roads or property?			
10. Are proper (not dirt) curb ramps installed?				23. Are soil, construction material, landscaping items, or other debris evident on the street?			
11. Are port-a-potties properly located off impervious areas and anchored down				24. Are spill prevention controls in place?			
12. Are runoff controls properly located and maintained? (e.g. silt fences, straw bails, waddles, etc.)?				25. Do locations exist where BMPs could be removed?			
13. Are there disturbed areas that have not had construction activities for 14 to 21 days without stabilization? (except snow or frozen ground)?				26. Should additional BMPs be installed that aren't in the SWPPP?			
14. Is a concrete wash out area with sign properly located on the site?				27. Is a concrete wash out area with sign properly located on the site?			
<b>COMMENTS AND CORRECTIVE ACTIONS FOR SWPPP COMPLIANCE</b>							
Identify the problem and its location. If appropriate, describe (in general terms) what needs to be completed. However, only if qualified (e.g., you are a designer) should you be mandating specific BMPs to install. Include the date when corrections are to be completed.							
Inspection Code (circle):	SW sampling SW non-sampling	Inspector Code (circle):	(S) State (L) Local	Type Code (circle):	1 - Municipal 2 - Industrial 4 - Federal		
Please list applicable Single Event Violation Codes:							
Inspector: 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.							
<b>Inspector:</b>							
(Print Name)		(Title)		(Signature)		(Date)	
<b>Operator:</b>							
(Print Name)		(Title)		(Signature)		(Date)	

**(Attach additional sheets of narrative, pictures and checklists, as necessary)**



# ADDITIONAL COMMENTS AND CORRECTIVE ACTIONS FOR Insert City Logo Here SWPPP COMPLIANCE

Site Name:	Date of Evaluation:	Page	of
------------	---------------------	------	----

Site Address:	
---------------	--

### EPA Form 3560-3 SEV Codes and Descriptions

Available Single Event Violation Codes for WW Storm Water Construction

DOR11	Discharge without a permit	BR19B	Failure to properly operate and maintain BMP's
DOR18	Failure to apply for a Notice of Termination	DOR12	Failure to submit required permit information
BOR12	Failure to conduct inspections	EOR16	Failure to submit required report (non-DMR)
BOC17	Failure to develop any or adequate SWPPP/SWMP	AOR22	Narrative effluent violation
BOC18	Failure to implement SWPPP/SWMP	EOR14	Noncompliance with section 308 information request
BOR41	Failure to maintain records	AOR12	Numeric effluent violation
COR11	Failure to monitor	BOR42	Violation of a milestone in an order
BR19A	Failure to properly install/implement BMP's		



## Long Term Storm Water Management Inspection Report

Project Name	
Inspection Date	
Inspector Name	
Project Location	
Current Owner (Name and Phone)	
Current Responsible Operator (Name and Phone)	

<b>Long Term (Post Construction) Storm Water Management Plan</b> 0 = Good 1 = Adequate 2 = Poor 3 = Missing	<b>Objectives:</b> 1. Control Soil Erosion 2. Controlling discharge of sediment into storm drainage facilities or onto adjacent properties 3. Preventing Illicit Discharges into on-site soils, into storm drainage facilities or onto adjacent properties
---	---

Reviewed - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Applicable to site	0	1	2	3	N/A
2. Objectives clearly stated	0	1	2	3	N/A
3. BMP's clearly shown	0	1	2	3	N/A
4. Storm Water Infrastructure clearly shown	0	1	2	3	N/A
5. Owner or Responsible Operator Listed with contact info	0	1	2	3	N/A

<b>Contributing Drainage Area</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
---

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash or Debris	0	1	2	3	N/A
2. Bare/Exposed soil	0	1	2	3	N/A
3. Evidence of Erosion	0	1	2	3	N/A
4. Trash enclosure in good shape	0	1	2	3	N/A
5. Excessive landscape waste \ yard clippings	0	1	2	3	N/A

<b>Inlets</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
---

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash, Debris, or Sediment in Inlets	0	1	2	3	N/A
2. Inlets provide stable conveyence into facility	0	1	2	3	N/A
3. Evidence of Erosion	0	1	2	3	N/A

<b>Pipes</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
--

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash, Debris, or Sediment in pipes	0	1	2	3	N/A
	0	1	2	3	N/A
	0	1	2	3	N/A
	0	1	2	3	N/A

<b>Treatment BMP's</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
--

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash, Debris, or Sediment in treatment BMP	0	1	2	3	N/A
2. Evidence of pollutants making it past treatment BMP	0	1	2	3	N/A
	0	1	2	3	N/A
	0	1	2	3	N/A

<b>Detention Facilities</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
---

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash, Debris, or Sediment in Detention	0	1	2	3	N/A
2. Vegetative Cover	0	1	2	3	N/A
3. Evidence of Erosion	0	1	2	3	N/A
	0	1	2	3	N/A

<b>Outlet to City Storm Drain</b> 0 = Good Condition. Well Maintained, no action required 1 = Moderate Condition. Adequately maintained, routine maintenance needed 2 = Degraded Condition. Poorly maintained routine maintenance and repair needed 3 = Serious Condition. Immediate need for repair or replacement
---

Inspected - Check (Yes) or (No)					
Item	0	1	2	3	Comments
1. Excessive Trash, Debris, or Sediment in outlet	0	1	2	3	N/A
2. Stable conveyence into facility	0	1	2	3	N/A
3. Evidence of Erosion	0	1	2	3	N/A
	0	1	2	3	N/A

<b>Comments and or corrective actions (including deadlines):</b>  
--

I \_\_\_\_\_, (site owner or responsible operator) hereby certify that I have inspected the site's long term storm water management plan and the site's storm water facilities and controls and that they are in good operating condition or if they are not, that any deficiencies noted will be corrected in a timely manner.

(Signature)

(Date)



## Pleasant Grove City's Detention Basin Inspection Report

<b>Address of facility:</b>	<b>Size of facility:</b>
<b>Date of visit:</b>	<b>Time of visit:</b>
<b>Provide the name(s) and title(s) of staff present during inspection</b>	
<b>Name</b>	<b>Title</b>
<b>Inspector Observations:</b>	
Does the basin remove sediment and trash from storm water flows?	
Review SOP for site and note any deficiencies	
<b>Storm sewer system and structural component inspection</b>	
Inspect inlet and outlet pipes for structural integrity	
Inspect riprap for clogging debris and/or sediment	
Inspect inlets, outlets, spill ways, and orifice for trash/debris that is blocking flow	
Inspect inlets, orifice boxes, and junction boxes for sediment	
Inspect detention pond for excess sedimentation	
<b>Vegetation management</b>	
Inspect for areas where vegetation has died or been eroded	
Inspect for weeds and other non-intended vegetation	

Inspect vegetation to prevent establishment of woody vegetation, and for aesthetics and mosquito control	
Check that grass has been mowed and clippings removed, if part of the detention basin design	
<b>Embankment and outlet stabilization</b>	
Inspect side slopes for erosion	
Check for rodent holes that may undermine berms and slopes	
<b>Pollution prevention</b>	
Inspect detention pond for signs of chemicals/pollutants (gasoline, paint, solvents)	
<b>Notes or additional information:</b>	

**Action Items**  
**Cost**

**Date Completed**

1.)		
2.)		
3.)		
4.)		

**Recommended Improvements**  
**Cost**

**Date Completed**

1.)		
2.)		
3.)		

## Pleasant Grove City's High Priority Site Semi-Annual Inspection Report

<b>High Priority Site:</b> (Cemetery, Rodeo Grounds, Public Works Shop, Pipe Plant Property Materials Storage Area)	
<b>Address of facility:</b>	<b>Size of facility:</b>
<b>Date of visit:</b>	<b>Time of visit:</b>
<b>Provide the name(s) and title(s) of staff present during inspection</b>	
<b>Name</b>	<b>Title</b>
<b>Inspector Observations:</b>	
Review SOP for site and note any deficiencies	
<b>SWPPP or stormwater plan</b>	
Has the maintenance facility developed a SWPPP or stormwater plan?	
Does the plan include a site map, list of pollutant sources, BMPs, and maintenance procedures?	
Does the permittee conduct and document periodic inspections of the facility?	
Are storm drains labeled and free of debris?	
<b>Vehicle maintenance, fueling and washing</b>	
Are vehicle maintenance activities conducted in a designated place not exposed to stormwater?	
Are fueling stations properly designed with spill kits nearby?	

Are vehicles washed on-site? Is wash water discharged to the MS4 or sanitary sewer?	
<b>Material storage</b>	
Are all materials that are potential stormwater contaminants stored under cover or in secondary containment?	
<b>Hazardous waste management</b>	
Are all hazardous materials properly labeled and stored to prevent exposure to stormwater runoff?	
<b>Waste management</b>	
Are waste bins covered with waste properly disposed in containers?	
How is landscape waste stored?	
<b>Spill response</b>	
Does the facility have a spill response plan, and are spill kits readily available?	
<b>Employee training</b>	
What type of stormwater training do maintenance staff receive?	
<b>Notes or additional information:</b>	

**Pleasant Grove City's High Priority Site Annual Visual Observation of Storm Water Discharge**

<b>High Priority Site:</b> (Cemetery, Rodeo Grounds, Public Works Shop, Pipe Plant Property Materials Storage Area)	
<b>Address of facility:</b>	<b>Size of facility:</b>
<b>Date of visit:</b>	<b>Time of visit:</b>
<b>Provide the name(s) and title(s) of staff present during inspection</b>	
<b>Name</b>	<b>Title</b>
<b>Inspector Observations:</b>	
Describe Storm Event.	
Any observed problems on outflow? (color, foam, sheen, turbidity, trash, sediment)	
Are containment structures in good shape?	
Are material stockpiles contained?	
Any other issues?	
<b>Notes or corrective actions:</b>	

## Pleasant Grove City's High Priority Site Weekly Inspection Report

<b>High Priority Site:</b> (Cemetery, Rodeo Grounds, Public Works Shop, Pipe Plant Property Materials Storage Area)	
<b>Address of facility:</b>	<b>Size of facility:</b>
<b>Date of visit:</b>	<b>Time of visit:</b>
<b>Provide the name(s) and title(s) of staff present during inspection</b>	
<b>Name</b>	<b>Title</b>
<b>Inspector Observations:</b>	
Review SOP for site and note any deficiencies	
Is there any evidence of spills?	
Are containment structures in good shape?	
Is there any loose trash at the site?	
Are there any uncontained material stockpiles?	
Are there any fertilizers or salts stored outside?	
<b>Notes or corrective actions:</b>	

# **APPENDIX A**

## **STORM WATER TECHNICAL MANUAL & BEST MANAGEMENT PRACTICES**

(Updated November 2020)

# PART 1

## STORM WATER TECHNICAL MANUAL

### A. INTRODUCTION

The Storm Water Technical Manual contains requirements for land development and construction activities as well as design criteria and guidelines for those performing such activities. It includes best management practices applicable to development and construction activities. It also includes the plan submittal requirements. The City Engineer has authority to modify the requirements of the Storm Water Technical Manual as needed to accomplish reasonable and effective storm water pollution prevention objectives.

### B. REQUIREMENTS FOR PROPOSED DEVELOPMENTS

#### 1. Incorporate best management practices (BMPs) into development design to limit quantity of runoff and preserve quality of runoff

Storm water BMPs must be considered throughout the development process. PART 2, CONSTRUCTION AND LONG-TERM BEST MANAGEMENT PRACTICES (formerly Post Construction) of the Pleasant Grove Storm Water Management Program contains fact sheets for BMPs whose use Pleasant Grove City encourages. Section F.2, Storm Water Quality Criteria of this Storm Water Technical Manual identifies BMPs that are required on all Construction Site Storm Water Management Plans.

#### 2. Prepare Construction Site Storm Water Management Plan

A Construction Site Storm Water Management Plan must be prepared and submitted with the development plans for approval. This requirement applies to all developments (other than construction of a single-family home, with associated on-site improvements). See section G of this chapter, CONSTRUCTION SITE STORM WATER MANAGEMENT PLAN CONTENTS for the required contents of the plan.

#### 3. Provide financial guarantee that improvements contained in the Construction Site Storm Water Management Plan will be installed and maintained

Financial guarantee must be posted with Pleasant Grove City prior to beginning construction. In the case of a subdivision of land, this will be included in the bond that is required for the cost of the subdivision improvements. In the case of site improvements, rather than a financial guarantee, non-monetary methods of enforcement already in place in Pleasant Grove City (business licenses, utility services, building and occupancy permits) are available to encourage compliance with the improvements contained in the approved Construction Site Storm Water Management Plan.



At the time of development, the developer shall provide an estimate of the cost of the required improvements. The City will review the estimate and establish the dollar amount of the financial guarantee.

**4. Prepare a Long-Term Storm Water Management Plan for new development and re-development**

A Long-Term Storm Water Management Plan must be prepared and submitted with the development plans for approval. This requirement applies to all developments and re-developments in which private improvements are constructed (except construction of single-family homes, with associated on-site improvements). See section H of this chapter, LONG-TERM STORM WATER MANAGEMENT PLAN CONTENTS for the required contents of the plan.

**5. Obtain UPDES Permit (all sites having land disturbance area equal to or greater than 1 acre)**

Developments having a disturbed area of 1 acre or more require a UPDES Storm Water General Permit for Construction activities from the Division of Water Quality of the Department of Environmental Quality of the State of Utah.

Obtaining the permit requires preparation of a Storm Water Pollution Prevention Plan (we would expect that the Construction Site Storm Water Management Plan previously described would suffice) and a Notice of Intent. Information regarding this process is available at: <https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits>. The developer must submit a copy of the Notice of Intent to the City before the site plan or improvement plans will be considered finalized.

Note that when a development of over 1 acre in size is phased, the permit is required for each phase, even if each phase is less than 1 acre in size.

## **C. REQUIREMENTS FOR CONSTRUCTION ACTIVITIES (OTHER THAN THOSE ASSOCIATED WITH INDIVIDUAL RESIDENTIAL STRUCTURES)**

### **1. Provide instruction to construction site operators regarding the Construction Site Storm Water Management Plan**

Prior to beginning work, developers and contractors must provide appropriate instruction to on-site construction supervisors and operators, regarding the requirements of the Construction Site Storm Water Management Plan. A copy of the approved plan must be present at the construction site.

### **2. Following Construction Site Storm Water Management Plan**

The improvements shown in the approved Construction Site Storm Water Management Plan must be constructed as indicated in the plan. The appropriate activities outlined in the Construction Site Storm Water Management Plan must be performed prior to any other construction activities on the site. Pleasant Grove City encourages modifications to the plan, when needed, to improve storm water management in light of site conditions. However, variations from the plan that reduce or eliminate elements of the plan must only be done with the approval of the Pleasant Grove City Public Works Representative or City Engineer.

### **3. Monitor effectiveness of the elements included in the Construction Site Storm Water Management Plan and make improvements as necessary to achieve the plan objectives.**

After initial implementation of the improvements outlined in the approved Construction Site Storm Water Management Plan, rainfall activity will provide opportunity to observe the effectiveness of the storm water management improvements. Those responsible for construction activities must monitor the in-place storm water management improvements to assess their effectiveness; they must then make adjustments to the improvements as needed to accomplish effective storm water management.

### **4. Provide verification that improvements were constructed as approved**

Following implementation of the improvements contained in the Construction Site Storm Water Management Plan, the preparer of the plan shall provide Pleasant Grove City with a statement as to the condition of the improvements contained in the plan. The statement shall be made on a copy of the Construction Site Storm Water Management Plan document and shall be signed.

If the improvements were constructed as approved, it shall include language verifying such. If the improvements were not constructed as approved, it shall state the differences, the reason for the differences, and provide an opinion as to the adequacy of the constructed improvements. This statement must be provided to

Pleasant Grove City at the time record drawings are submitted (in the case of public improvements) or prior to issuance of an occupancy permit (in the case of private site improvements)

## **D. REQUIREMENTS FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH INDIVIDUAL RESIDENTIAL STRUCTURES**

### **1. Construction Site Storm Water Management Plan**

While the Public Works Representative or City Engineer may require that a Construction Site Storm Water Management Plan be created on individual residential lots in special circumstances, generally no lot-specific plan is required.

### **2. Sediment Control on Small Construction Sites**

The BMP fact sheet for Sediment Control on Small Construction Sites (SCSCS) is to be included as a part of the building permit. This BMP applies to construction and landscaping activities associated with individual residential structures and shall be followed.

### **3. Owner or operator shall make adjustments to practices as needed to prevent storm water pollution**

Sediment that is left in the street or on adjacent lots is evidence of inadequate sediment control. Where storm water pollution prevention measures are inadequate, or are not being properly followed, the Public Works Representative, Community Development Representative or City Engineer may refuse to perform inspections or shut down work on the project.

## **E. REQUIREMENTS FOR EXISTING DEVELOPMENTS**

### **1. Following approved Long-Term Storm Water Management Plan**

The owners of existing developments are responsible to maintain improvements and observe practices that were part of an approved Long-Term Storm Water Management Plan. Failure to adhere to the plan may result in failure of the City to renew business licenses, fines, or other action as prescribed by Pleasant Grove City Code.

### **2. Operator or owner makes adjustments to practices or improvements when necessary to achieve Long-Term Storm Water Management Plan objectives**

Pleasant Grove City encourages adjustments to the plan that enhance effective storm water management. However, significant reduction of practices contained in the plan is to be accomplished through formal modification of the plan and resubmission to the Development Review Committee (or designee) for approval.

## **F. STORM WATER PERFORMANCE CRITERIA AND DESIGN GUIDELINES**

The following storm drainage criteria and design guidelines apply to all storm drainage plans in Pleasant Grove and shall be used in storm drainage calculations. The City Engineer has authority to modify the criteria and guidelines as needed to meet changing or unusual needs or conditions, or updates in federal or state requirements. Two principle categories of design criteria must be met:

- Low Impact Development meeting all local, state and federal requirements
- Design storm detention and conveyance

The design criteria for each of these is outlined in further detail below.

### **1. Low Impact Development Design Guidelines (LID)**

- A. 80<sup>th</sup> Percentile Storm Management: Infiltrate, evapotranspire and/or harvest and use rainwater on site for the first 0.5 inches of water per storm (daily rainfall) to the maximum extent practicable. The city's analysis has determined that 0.5 inches is the appropriate depth within its boundaries for the 80<sup>th</sup> percentile storm.
- B. Specific LID Design methodology and BMPs acceptable to Pleasant Grove City are included in the most recent version of "A Guide to Low Impact Development within Utah" prepared for the Utah Department of Environmental Quality, Division of Water Quality ("Guide").
  - i. Variances from the Guide specific to Pleasant Grove City:
    - a. Typical Single-Family Residential Developments must purchase credits towards the City's LID bank in lieu of implementing infiltration or water quality measures onsite, unless subject to the following exclusions:
      - i. Purchases of credit towards the LID bank are subject to availability of existing or planned banking facilities, as determined by the City Engineer.
      - ii. Available or planned banks must be effective in offsetting the LID design volume ( $V_{goal}$ ) for the proposed development, as determined by the City Engineer.
    - b. Non-Single-Family Residential Developments are required to fully implement LID standards onsite and ensure operation and maintenance through long term storm water management plan development and implementation.
    - c. Include Drinking Water Source Protection areas (DWSP) in Flow Chart 1 consideration. Typically, surface infiltration in vegetative areas is acceptable in these areas. Direct underground infiltration is not acceptable unless water is first cleaned through pretreatment, such as a hydrodynamic separator. No direct underground injection of storm water is permitted within Zone 1

of any Drinking Water Source Protection Zone for wells and springs.

- i. The city may supply a “Stormwater LID Information” map which may be used as a reference in determining DWSP zones but is not considered final or all-inclusive.
- d. The necessity of sprinklers, fertilization, and operation and maintenance issues must also be considered in selecting BMP and vegetation types.
- e. Permeable pavements in areas regularly trafficked by vehicles are generally not permitted but may be considered on a case-by-case basis by the City Engineer.
- f. The developer may propose additional LID BMP’s if they are similar in analysis, form, and function as the BMP’s in the Guide. Calculations and/or documentation must be provided demonstrating the effectiveness. The City Engineer reserves the right to accept or reject the BMPs based on its opinion of effectiveness for the given situation, or the adequacy of the documentation.
- g. The City Engineer may reject or require adjustments to BMPs that may be ineffective, unproven, or create excessive or unaddressed maintenance concerns, or may create a public nuisance.

### C. LID Design Process

All developments that disturb an area greater than one acre or re-development projects that increase the amount of impervious area by 10 percent are required to manage rainfall from the 80<sup>th</sup> percentile storm through infiltration, evapotranspiration and/or harvesting or reusing. The State of Utah has developed “A Guide to Low Impact Development within Utah” (Guide) to help meet this requirement. Pleasant Grove City has differentiated between typical single-family residential developments and non-single-family developments and created separate design processes for each to meet the requirements. These processes are described below.

- i. Non-Single-Family Residential, Mixed-Use, and similar Developments, as determined by City Engineer:
  - a. Fill out Storm Water Quality Report Template located in Appendix A of the Guide.
  - b. Follow Flow Charts 1-3 from the “LID BMP Selection” section of the Guide to determine if retention or treatment BMP is appropriate for the proposed development.
  - c. Select BMP’s appropriate for proposed development and follow provided checklists in design.
  - d. Design site storm water system including LID requirements and submit all checklists, flow charts, and calculations to the City for review.
- ii. Single-Family Residential:
  - a. Follow design process for Non-Single-Family Residential or purchase credits towards the LID bank.

- b. A combination of implementing some LID measures and purchasing credits in a bank may be considered by the City Engineer on a case-by-case basis.
- c. The City Engineer may require specific minimum water quality measures be put in place even if LID bank credits are approved to offset infiltration or more rigorous water quality measures.
- iii. The City retains the right to accept or reject ownership of LID measures implemented onsite for any reason. For any LID measure, whether located in city right-of-way or not, the city may require that specific measures be maintained by the property owners under an acceptable long-term maintenance agreement with the owner or a property owners' association. This includes, but is not limited to, measures requiring continual maintenance of vegetation or otherwise high levels of maintenance.

## **2. Storm Water Detention and Conveyance Quantity Criteria & Design Guidelines**

### **A. Detention and Conveyance Design Storm**

- i. Frequency
  - a. Design piping system for a 25-year storm and detention for a 10-year storm
  - b. Control the point of discharge and the flooding hazard of a 100-year storm
  - c. Design piping and detention systems for a 100-year storm in those areas identified in the City's most recent Storm Water Master Plan as requiring the higher standard.
- ii. Depth and Intensity— site specific per the following Website:  
[http://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html?bkmrk=ut](http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ut)
- iii. Hydrograph method
  - a. A 6-hour SCS type II rainfall distribution is considered acceptable for hydrograph method analysis.
  - b. Other methods will be considered on a case-by-case basis.

### **B. Runoff Coefficients**

The design engineer is to calculate a composite runoff coefficient based on surface type and associated runoff coefficient, weighted by the area of each surface type.

### **C. Inlet Spacing**

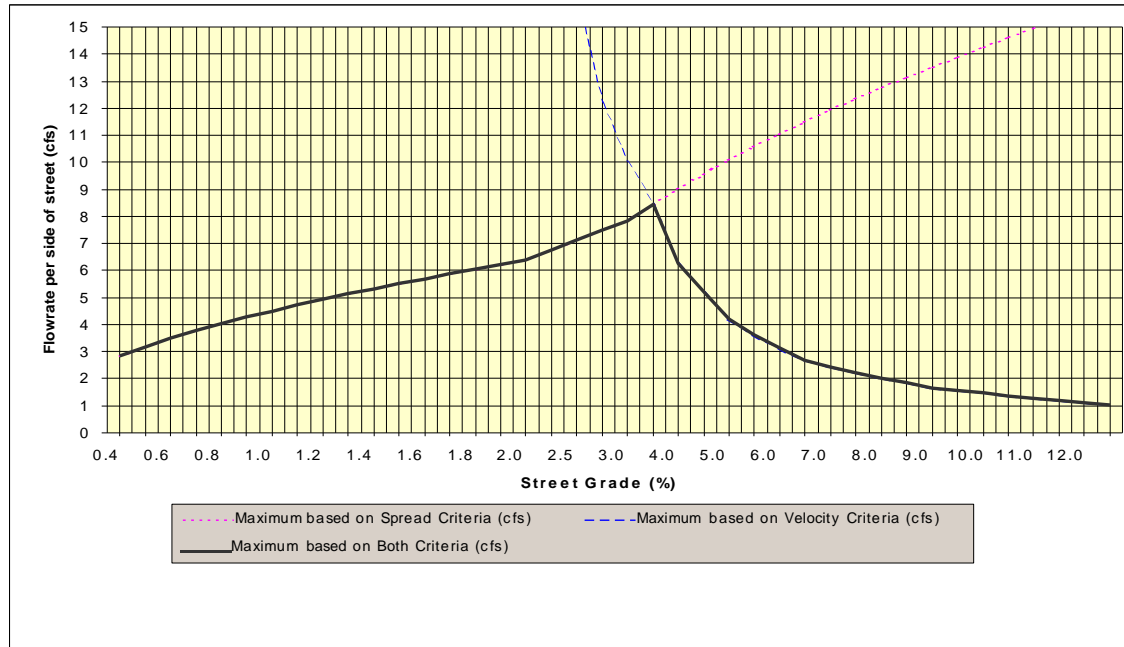
Two criteria must be met:

- i. Spread of water in the street—storm water must be delivered from the street into an underground piped system when the spread of water in the street covers the outside 10 feet of asphalt. This will leave two 7-foot traffic lanes in local streets and three 10-foot traffic lanes in collector streets that are not submerged.

- ii. Gutter velocity—water must be delivered from the street into an underground piped system when the velocity of water in the deepest part of the gutter reaches 10 feet per second (as a safety consideration).

Each of these requirements is a function of street slope and storm water flow rate. Storm water must be delivered from the street to storm drains when flows reach amounts shown in the following graph, Figure 2:

**Figure 2. Maximum Flow Rates Allowed in Streets (25-year storm)**



Note: The spread of water in the street is calculated using the Manning Equation in the form developed by Izzard, with a roughness coefficient of 0.013 and the standard street cross section. The velocity criteria calculates the velocity at the deepest part of the gutter with the Manning's Equation, with a roughness coefficient of 0.013, and using a depth at a point six inches from the face of the curb as the hydraulic radius.

#### D. Inlet Capacity

The designer is to assume 50% blockage of inlets when considering storm drain inlet capacity.

#### E. Detention

Storm water must be detained such that the peak flow rate released from the site does not exceed 0.15 cubic feet per second per acre (cfs/acre) (0.05 cfs/acre in areas identified in the City's most recent Storm Water Master Plan as requiring the higher standard). The following limitations apply to detention basins:

- i. No part of the bottom of a landscaped detention area may be flatter than 1%.
- ii. Within 10 feet of the outlet, the slope of a landscaped basin bottom must not be flatter than 3% unless a concrete apron is constructed around the outlet.
- iii. Excluding areas within 10 feet of the outlet, the maximum allowable depth of the basin is 3 feet. Basins proposed with greater depths may be allowed

with conditions including but not limited to security fencing, escape facilities etc.

- iv. Storm drain pipes are to continue through detention areas to allow low flows to proceed through the storm drainage system without having to come to the surface. These low flows must still pass through the outlet restriction that limits runoff rates.
- v. Basins are to be designed such that water does not run into them after they reach a maximum depth (unless a free flowing overflow is provided)—this can often be controlled by the elevation of an inlet box in the street adjacent to the basin.
- vi. The design drawings for the basin shall include the total basin area, side slopes and width of the berm or height of retaining walls if used, basin depth, storage capacity curve, and design details of the outlet control structure including orifice plate installation.
- vii. Side slopes shall not be steeper than 3-feet horizontal to 1-foot vertical (3:1).
- viii. A minimum freeboard of 1' shall be provided except when designing for the 100-year storm event freeboard shall be a minimum of 3 inches in order to direct flows from the detention basin to a public right of way at the location of a provided spillway.
- ix. The minimum top-width of any berm shall be 3 feet unless approved otherwise by the City Engineer.
- x. Control structures must be in locations accessible to cleaning equipment.
- xi. Where accessibility is required through a landscaped area, provide a design for the access way that will accommodate the weight of the cleaning equipment/vehicles.
- xii. The volume of pipe, manholes, boxes (and similar structures), and ponding in parking lots may be used as part of the detention volume, but the ponding water cannot interfere with the ability of the conveyance, treatment, and LID facilities to function.
- xiii. Detention in parking lots cannot exceed 6" in depth before the water overflows the detention system for up to the 100-year event. All other typical parking design criteria must be met

F. Deviations from this standard may be approved on a case by case basis by the City Engineer given unusual site conditions and/or storm water management objectives.

### **3. Storm water quality criteria**

#### **A. Storm Water Treatment**

Pretreatment must be utilized prior to discharging storm water into city systems, bodies of water, drainages, or into the soil. It must be treated to reduce illicit discharges of sediment, oils, floatables and other pollutants. The treatment method must be approved by the City Engineer.



Pretreatment Design Criteria:

- Treat all flow up to the 2-year storm peak flow and volume.
- Must retain the majority of trapped sediment and pollutants during bypass events.
- In a system that injects water directly into the soil, the City Engineer may specify a larger design event for pretreatment or require that other protective measures be installed.

B. Use of Best Management Practices

Pleasant Grove City encourages the use of the BMP fact sheets included in PART 2, CONSTRUCTION AND LONG-TERM BEST MANAGEMENT PRACTICES. **The following BMPs are required to be a part of all Construction Site Storm Water Management Plans:**

* BMP Inspection & Maintenance	BMPIM
* Concrete Waste Management	CWM
* Dust Controls	DC
* Hazardous Waste Management	HWM
* Material Storage	MS
* Portable Toilets	PT
* Spill Clean-Up	SCU
* Vehicle and Equipment Cleaning	VEC
* Vehicle and Equipment Fueling	VEF

There is no list of BMPs that are required on all Long-Term Storm Water Management Plans.

In addition to the required BMPs listed above, other BMPs from PART 2, CONSTRUCTION AND LONG-TERM BEST MANAGEMENT PRACTICES that apply to a given development should be used. Pleasant Grove City also encourages the use of practices in addition to those contained in the Pleasant Grove Storm Water Management Program that may be suitable for a given development. Engineering judgment must be used in selecting BMPs for a given development.

C. Prohibited Practices

The following practices are specifically prohibited:

- i. Soil or construction materials may not be piled in streets.
- ii. Soil bridges over curb and gutter may not be constructed.

# **G. CONSTRUCTION SITE STORM WATER MANAGEMENT PLAN CONTENTS**

## **1. Purpose of the Construction Site Storm Water Management Plan**

The purpose of the Construction Storm Water Management Plan is to control storm water runoff and reduce pollutants in storm water runoff during construction by accomplishing the following:

- A. Controlling soil erosion
- B. Controlling discharge of sediment into storm drainage facilities or onto adjacent properties
- C. Preventing illicit discharges into on-site soils, into storm drainage facilities, or onto adjacent properties
- D. Preventing uncontrolled discharge of storm water to adjacent property
- E. Controlling construction waste
- F. Controlling dust

## **2. Contents of the Construction Site Storm Water Management Plan**

The Construction Storm Water Management Plan is to be submitted with the site plans or improvement plans, and is to contain at least the following elements:

- A. Utilize the standard SWPPP template and instruction provided at the following website: <https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits>
- B. Plan views shall be provided on 11” x 17” paper
- C. Existing and proposed contours as shown on the grading plan
- D. Existing and proposed storm drainage improvements
- E. Best management practices to accomplish the purpose of the plan – show the following for each BMP specified, as applicable:
  - i. Location and extent of specified BMP
  - ii. Timing of implementation, possibly in terms of planting season or number of days following commencement of grading
  - iii. Duration of implementation
  - iv. Any information in addition to or different from that shown on the BMP fact sheet as necessary to employ the BMP on the site

- F. BMP Fact sheets or other descriptive material for all specified BMPs
- G. Proposed re-vegetation—show the following:
  - i. Location and type of re-vegetation proposed
  - ii. Timing of re-vegetation, possibly in terms of planting season or number of days following commencement of grading
- H. Sequencing of construction activities and BMPs
- I. Name, address & telephone number of individual who has responsibility for implementation and maintenance of the plan.
- J. Final SWPPP plan to be submitted in an 8.5" x 11.0" binder

## **H. LONG-TERM STORM WATER MANAGEMENT PLAN CONTENTS**

### **1. Purpose of the Long-Term Storm Water Management Plan**

The purpose of the Long-Term Storm Water Management Plan is to control storm water runoff and reduce pollutants in storm water runoff after construction is complete and the developed site is in operation. This is achieved by accomplishing the following:

- A. Controlling soil erosion
- B. Controlling discharge of sediment into storm drainage facilities or onto adjacent properties
- C. Preventing illicit discharges into on-site soils, into storm drainage facilities, or onto adjacent properties
- D. Mirror the predevelopment hydrology as much as practicable for new development and improve the hydrology of redeveloped sites

### **2. Contents of the Long-Term Storm Water Management Plan**

The Long-Term Storm Water Management Plan is to be submitted separate from the site plan or improvement plans. It shall be contained in a manila folder and is to contain at least the following:

- A. Name and contact information of the person responsible for long-term maintenance of the storm water system.
- B. A Storm Water Maintenance Agreement. This should be filled out completely and ready for review and signature by a City Official.
- C. An 11" x 17" copy of the site plan, including vicinity map, proposed contours, permanent storm drainage improvements, landscaping, and best management practices to accomplish the purpose of the plan. Examples of appropriate BMPs may include those addressing operation and maintenance of storm drainage quality control facilities, operation and maintenance of storm water discharge control facilities, maintenance of landscaping, good housekeeping practices, etc. Show the following for each BMP specified:
  - i. Location and extent of specified BMPs, as appropriate
  - ii. Detailed schedule of execution for each specified BMP, in terms of starting time, duration, frequency, etc., as appropriate
  - iii. Any information in addition to or different from that shown on the BMP fact sheets as necessary to employ the BMPs on the site

- D. BMP fact sheets or other descriptive material for all specified BMPs. BMP fact sheets that are part of the Long-Term Storm Water Management Plan are to be on a separate sheet from those BMP fact sheets associated with the Construction Site Storm Water Management Plan. Each BMP fact sheet should be printed on a separate 8.5" x 11" paper.
- E. Final storm drainage calculations. These should be a finalized set of calculations defined in Section F of this document.
- F. The following statement shall prominently appear on the site plan submitted with all Long-Term Storm Water Management Plans:

The owner(s) of the property are responsible to perpetually follow this Long-Term Storm Water Management Plan. Failure to follow the plan may result in the City refusing to renew business licenses or taking other action against the property owner.

The objectives of the Plan are to:

1. Control soil erosion
2. Control discharge of sediment into storm drainage facilities or onto adjacent properties
3. Prevent illicit discharges into on-site soils, into storm drainage facilities, or onto adjacent properties
4. Mirror the predevelopment hydrology as much as practicable for new development and improve the hydrology of redeveloped sites

If the objectives of the Plan are not being met, the site operator or owner shall make adjustments to the Plan as needed to accomplish its purposes.

Pleasant Grove City encourages adjustments to the plan that enhance effective storm water management. However, significant reduction of practices contained in the plan is to be accomplished through formal modification of the plan and resubmission to the City Engineer for approval.

## **I. PROPOSED CONSTRUCTION AND LONG-TERM STORM WATER MANAGEMENT PLAN REVIEW PROCEDURES**

The Construction Storm Water Management Plan and Long-Term Storm Water Management Plan will be submitted to Pleasant Grove City with the development plans. They will be reviewed along with the development plans, with storm water quantity and quality benefits in mind. The review procedure will be the same as for subdivision improvement plans and site plans.

## **J. CONCLUSION**

Inasmuch as the construction and post construction related best management practices will generally be carried out by those in the private construction industry, they will be implemented as specified in specific construction site and long-term storm water management plans as development occurs. The BMPs found in PART 2, BMPs PERFORMED BY PLEASANT GROVE CITY, cover Pleasant Grove City's efforts to assure that the plans are followed.

Pleasant Grove City's Storm Water Technical Manual satisfies, in part, two of the six minimum control measures established by the Storm Water Phase II Rule: #4: Construction site storm water runoff control, and #5: Post-construction storm water management in new development and redevelopment.

# PART 2

## CONSTRUCTION AND LONG-TERM BEST MANAGEMENT PRACTICES

### A. BMP Index

Pleasant Grove City encourages the use of the following best management practices on Construction Site and Long-Term Storm Water Management Plans. As established in Section F.3.A of PART 1, STORM WATER TECHNICAL MANUAL, **BMPs with an asterisk are required to be a part of all Construction Site Storm Water Management Plans.** Additional LID BMPs are available in the State’s LID Guide and should be considered for each site.

Benching	BE
Biofilters	BF
* BMP Inspection & Maintenance	BMPIM
Brush or Rock Filter	BRF
Building Repair, Remodeling & Construction	BRRC
Catch Basin Cleaning	CBC
Contaminated or Erodible Surface Areas	CESA
Compaction	CP
Construction Road Stabilization	CR
Construction Sequencing	CS
Constructed Wetlands	CW
* Concrete Waste Management	CWM
* Dust Controls	DC
Diversion Dike	DD
Detention/Infiltration Device Maintenance	DIDM
Earth Berm Barrier	EB
Erosion Control Blankets	ECB
Extended Detention Basins	EDB
Filter Strips	FS
Geotextiles and Mats	GM
Grading Practices	GP
Grassed Swales	GS
Hydromulching	HM
* Hazardous Waste Management	HWM
In-Line Storage	ILS
Infiltration	IN
Inlet Protection – Concrete Block	IPC
Inlet Protection – Excavated	IPE
Inlet Protection – Gravel	IPG
Inlet Protection – Silt Fence or Straw Bale	IPS
Level Spreaders	LS

* Material Storage	MS
Mulching	MU
Outlet Protection	OP
Parking Lot Sweeping/Vacuuming	PLSV
* Portable Toilets	PT
Rock Check Dams	RCD
Riprap	RR
Sediment Basin	SB
Sand Bag Barrier	SBB
Street Cleaning	SC
Stabilized Construction Entrance and Wash Area	SCEWA
Sediment Control on Small Construction Sites	SCSCS
* Spill Clean-Up	SCU
Slope Drain	SD
Storm Drain Flushing	SDF
Silt Fence	SF
Seeding and Planting	SP
Surface Roughening	SR
Sediment Trap	ST
Straw Bale Barrier	STB
Temporary Drains and Swales	TDS
Temporary and Permanent Seeding	TPS
Temporary Stream Crossing	TSC
* Vehicle and Equipment Cleaning	VEC
* Vehicle and Equipment Fueling	VEF
Waste Disposal	WD
Wet Ponds	WP

## **B. LID LONG-TERM MANAGEMENT BMPs**

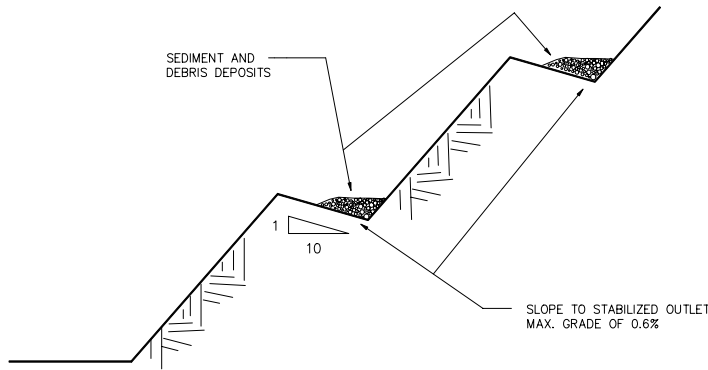
No specific list of Long-Term Low Impact Development (LID) BMP fact sheets is provided. Reference is made to the manual distributed by the Utah Division of Water Quality titled “A Guide to Low Impact Development within Utah” (Guide), particularly the maintenance portion of the BMP Fact Sheets found in Appendix C of the Guide. For BMPs which may not be in the manual, BMP Maintenance Fact Sheets equivalent in scope and detail must be provided, in accordance with industry standards and published data.

LID BMP information and Fact Sheets should be included in the Long-Term Management Plan in the same fashion as traditional BMP measures, with any necessary additional data as may be required to provide a complete maintenance guide and plan.

## **C. BMP FACT SHEETS**

The following sheets contain BMP Fact Sheets for use in Pleasant Grove.





**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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

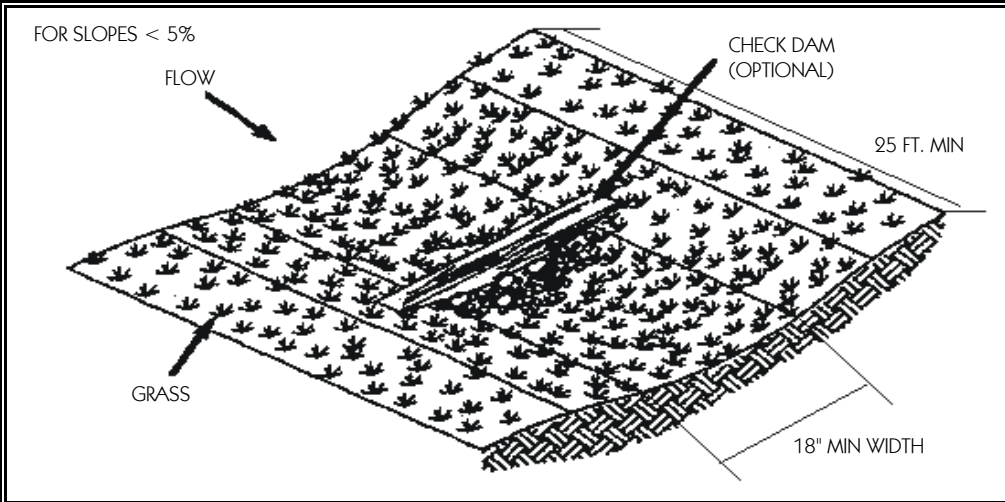
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**CONSIDERATIONS**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Biofilters are of two general types: vegetated channel and vegetated filter strip. The vegetated channel is sloped like a standard storm drain channel; the storm water is treated as it passes through the channel. With filter strips the flow is distributed broadly along the width of the vegetated area.

**APPLICATION:**

- ▶ Comparable performance to wet ponds and constructed wetlands.
- ▶ Limited to treating a few acres.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ The surface area must be defined.
- ▶ The minimum width for a swale is determined by Mannings Equation.
- ▶ Minimum length of a strip is 10 feet.
- ▶ The longitudinal slope must not exceed 5%.
- ▶ Use a flow spreader and energy dissipater at the entrance of a swale.
- ▶ Good soils are important to achieve good vegetation cover.

**LIMITATIONS:**

- ▶ Good performance depends upon good design
- ▶ May be limited to areas where summer irrigation is feasible.
- ▶ Can be difficult to maintain sheet flow in strips.
- ▶ Can be difficult to avoid channelization in swales.
- ▶ Cannot be placed on steep slope.
- ▶ Area required may make infeasible on industrial sites.
- ▶ Proper maintenance required to maintain health and density of vegetation.
- ▶ Limited to treating a few acres and availability of water during dry season.

**MAINTENANCE:**

- ▶ Make sure soils are suitable for healthy vegetation.
- ▶ Level cross-section and even longitudinal slope for swales.
- ▶ Any damage to the channel such as rutting must be repaired with suitable soil, properly tamped and seeded.

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**APPLICATIONS**

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

**DESCRIPTION:**

Inspect and maintain all structural BMP's (both existing and new) on a routine basis to remove pollutants from entering storm drain inlets. This includes the establishment of a schedule for inspections and maintenance.

**APPROACH:**

Regular maintenance of all structural BMP's is necessary to ensure their proper functionality.

- Annual inspections.
- Prioritize maintenance to clean, maintain, and repair or replace structures in areas beginning with the highest pollutant loading.
- Clean structural BMP's in high pollutant areas just before the wet season to remove sediments and debris accumulated during the summer and fall.
- Keep accurate logs of what structures were maintained and when they were maintained.
- Record the amount of waste collected.

**LIMITATIONS:**

- Availability of trained staff



**TARGETED POLLUTANTS**

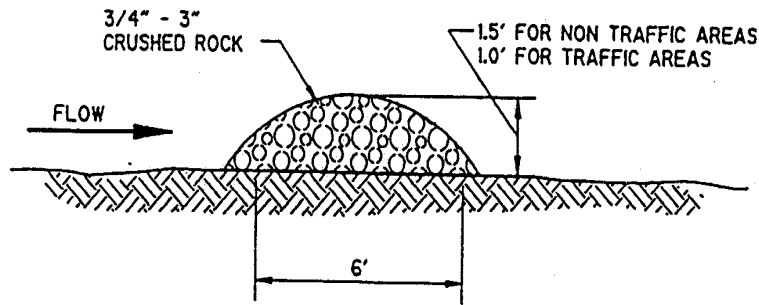
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

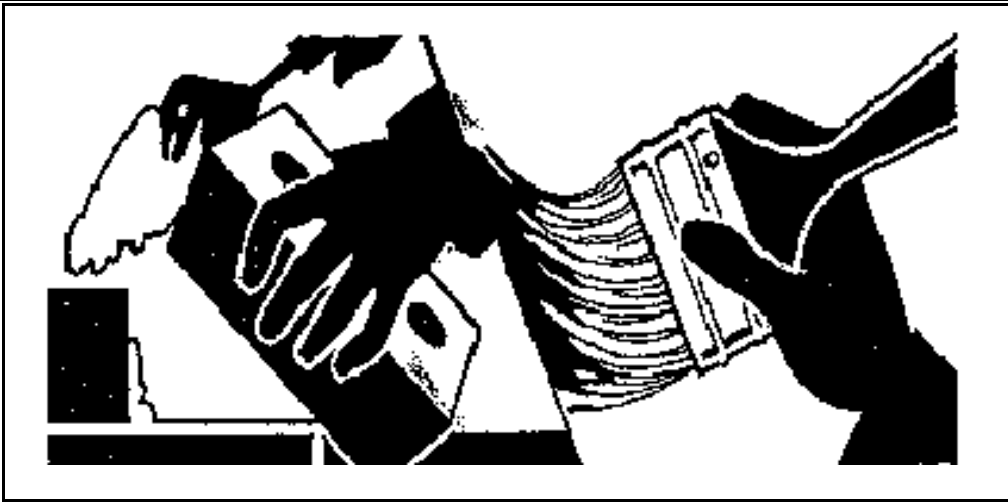
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**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 is 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 of 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.

**TARGETED POLLUTANTS**

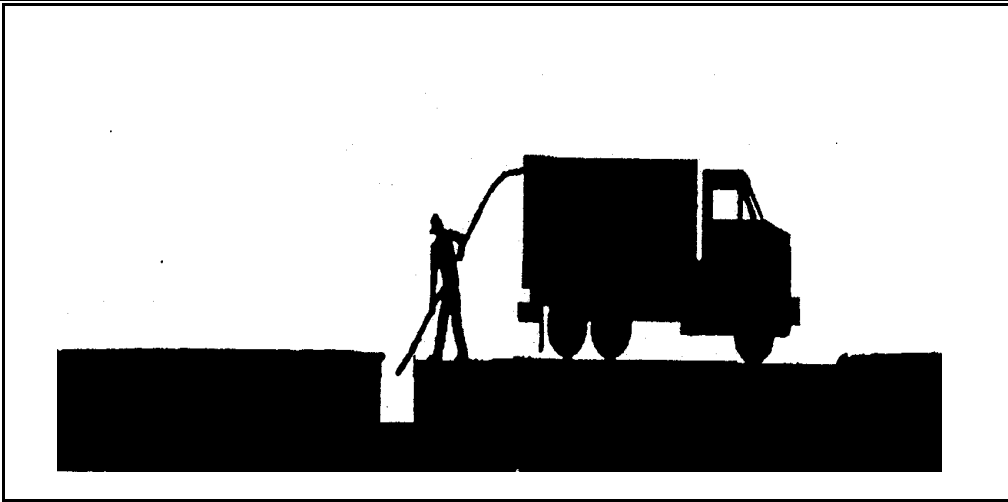
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**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
- ▶ Removal of contaminated soils
- ▶ 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.

**MAINTENANCE:**

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

**TARGETED POLLUTANTS**

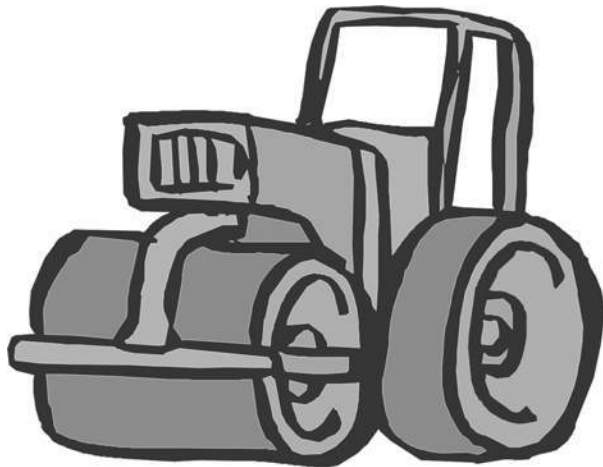
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**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.

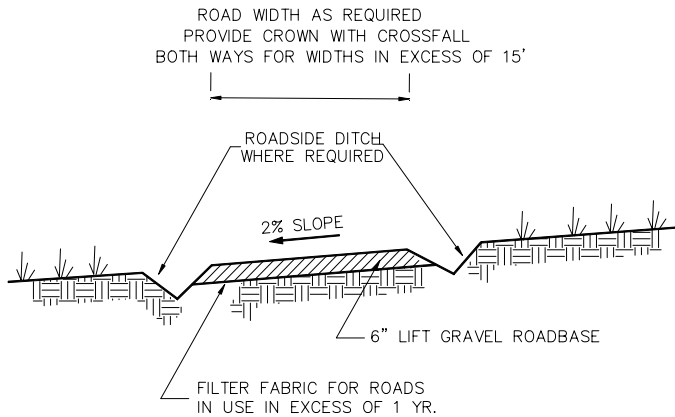
**LIMITATIONS:**

- ▶ 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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**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.



**In sequenced construction, sites are completed in stages and completed portions are permanently stabilized before other areas are disturbed**

**DESCRIPTION:**

Construction sequencing requires creating and following a work schedule that balances the timing of land disturbance activities and the installation of measures to control erosion and sedimentation, in order to reduce on-site erosion and off-site sedimentation. Staging areas can be used to limit contamination and erosion.

**APPROACH:**

Construction sequencing can be used to plan earthwork and erosion and sediment control (ESC) activities at sites where land disturbances might affect water quality in a receiving water body.

Construction sequencing schedules should, at a minimum, include the following:

- The ESC practices that are to be installed
- Principal development activities
- Which measures should be installed before other activities are started
- Compatibility with the general contract construction schedule

The following activities and features should be included (as they apply):

- Construction access—entrance to site, construction routes, areas designated for equipment parking
- Sediment traps and barriers—basin traps, sediment fences, outlet protection
- Runoff conveyance system—stabilize stream banks, storm drains, channels, inlet and outlet protection, slope drains
- Land clearing and grading—site preparation (cutting, filling, and grading, sediment traps, barriers, diversions, drains, surface roughening)
- Landscaping and final stabilization—top-soiling, trees and shrubs, permanent seeding, mulching, sodding, riprap

**LIMITATIONS:**

- Weather and other unpredictable variables may affect construction sequence schedules.

**MAINTENANCE:**

- The construction sequence should be followed throughout the project and the written plan should be modified before any changes in construction activities are executed.

**APPLICATIONS**

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



**TARGETED POLLUTANTS**

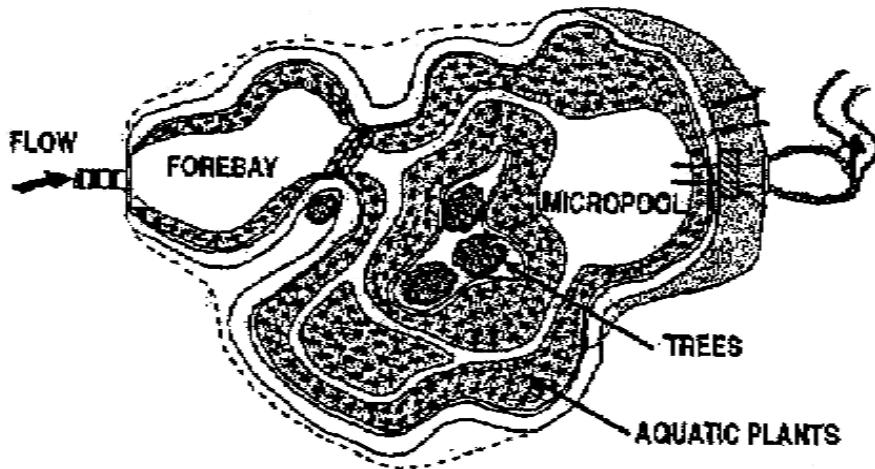
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**CONSIDERATIONS**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Constructed wetlands have a significant percentage of the facility covered by wetland vegetation.

**APPLICATION:**

- ▶ Need to achieve high level of particulate and some dissolved contaminant removal.
- ▶ Ideal for large, regional tributary areas.
- ▶ Multiple benefits of passive recreation and wildlife.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Suitable soils for wetland vegetation are required.
- ▶ Surface area equal to at least 1% and preferably 2% of the tributary watershed.
- ▶ Include a forebay for extra storage and to trap incoming sediment.
- ▶ Involve qualified wetland ecologist to design and install wetland vegetation.
- ▶ Establishing wetland vegetation may be difficult.

**LIMITATIONS:**

- ▶ Concern for mosquitoes.
- ▶ Cannot be placed on steep unstable slopes.
- ▶ Need base flow to maintain water level.
- ▶ Not feasible in densely developed areas.
- ▶ Nutrient release may occur during winter.
- ▶ Overgrowth can lead to reduced hydraulic capacity.
- ▶ Regulatory agencies may limit water quality to constructed wetlands.

**MAINTENANCE:**

- ▶ Remove foreign debris and sediment build-up.
- ▶ Areas of bank erosion should be repaired.
- ▶ Remove nuisance species.
- ▶ Control mosquitoes.

**TARGETED POLLUTANTS**

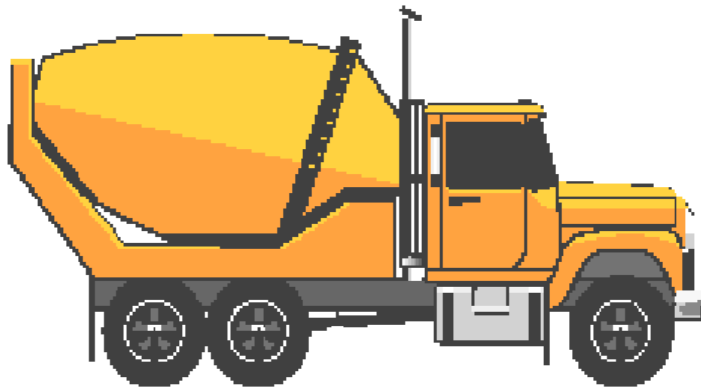
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**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:**

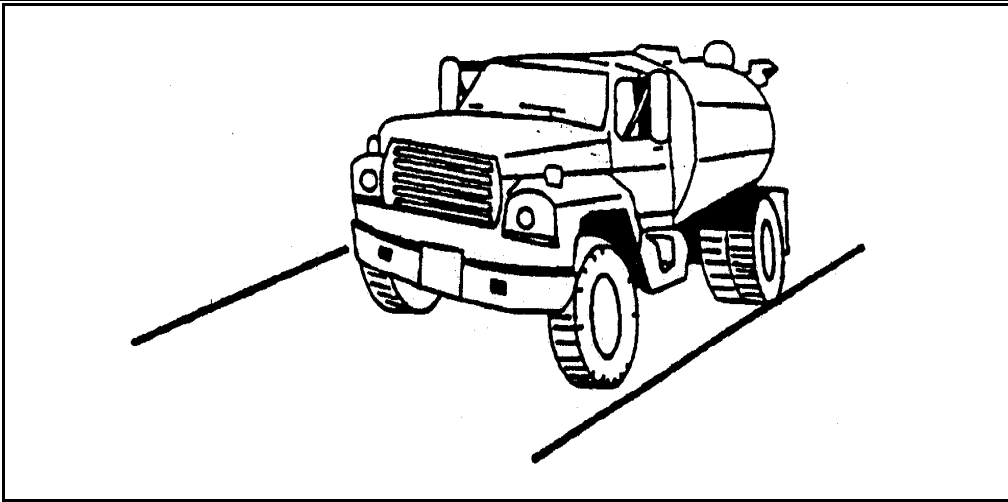
- ▶ Store dry and wet materials under cover, away from drainage areas.
- ▶ Avoid mixing excess amounts of fresh concrete or cement on-site.
- ▶ Perform washout of concrete trucks off-site or in designated areas only.
- ▶ Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- ▶ 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.



**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:**

- ▶ 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.
- ▶ Water may be sprayed on the ground surface to moisten dry soils, making it less susceptible to wind erosion.

**LIMITATIONS:**

- ▶ Street sweeping is labor and equipment intensive and may not be effective for all pollutants.
- ▶ Water sprayed from water trucks must be done at a rate such that the water is absorbed in the soil; if excessive amounts of water are used, it may run off, carrying soil with it.

**MAINTENANCE:**

If excess water results from water spraying, dust-contaminated waters should not be allowed to run off site. Areas may need to be resprayed to keep dust from spreading.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

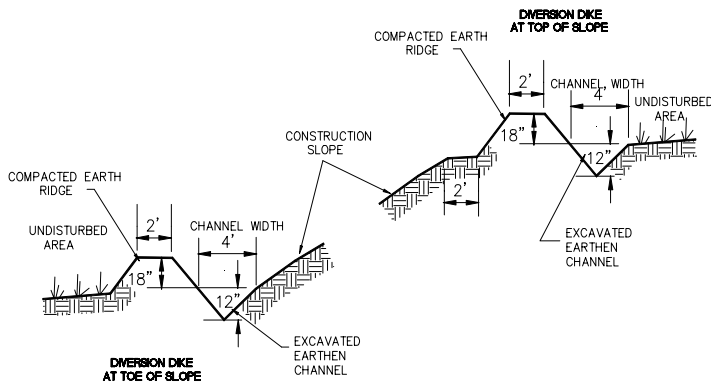
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**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**

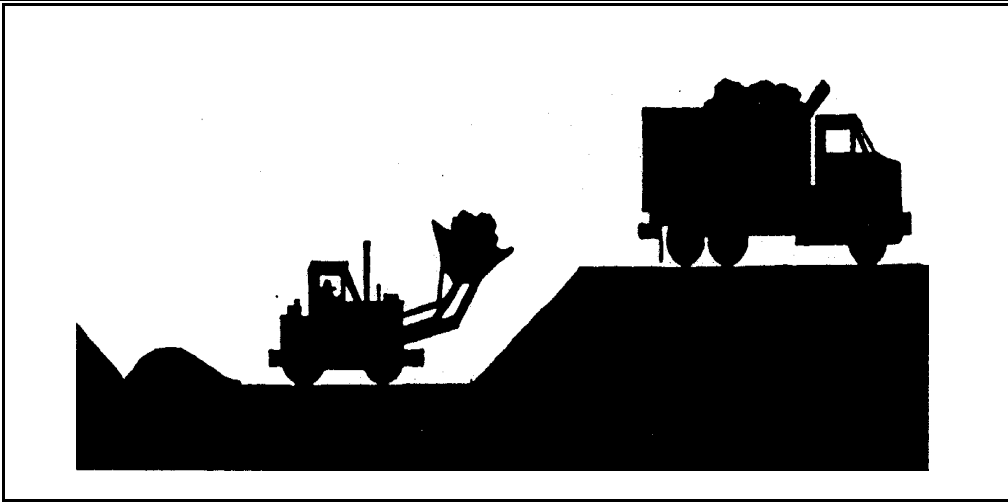
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

Proper maintenance and siltation removal is required on both a routine and corrective basis to promote effective storm water 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 ½ 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 slurried 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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

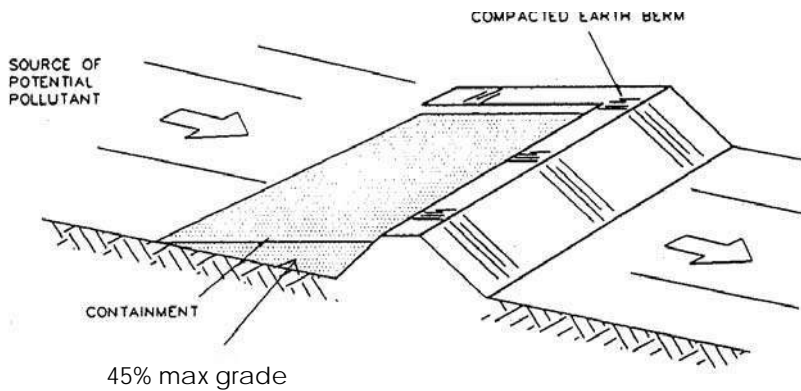
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**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.

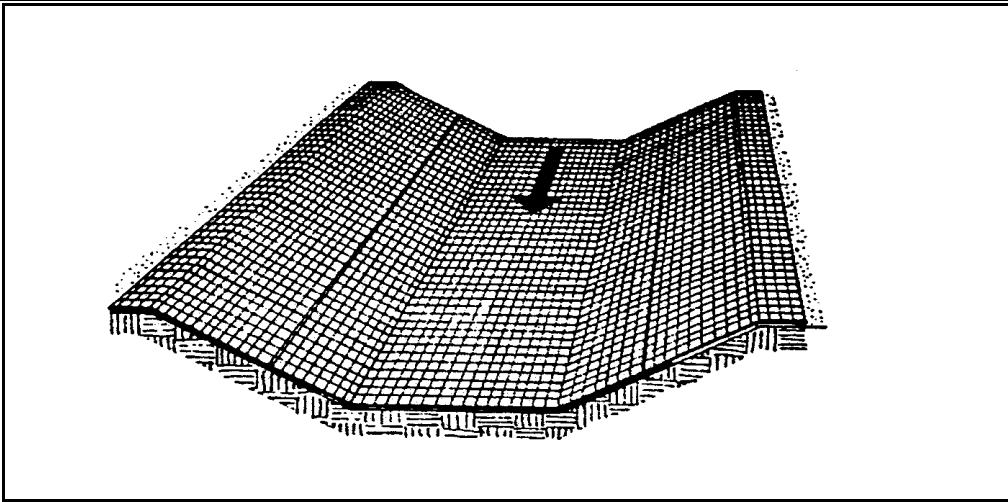
**LIMITATIONS:**

- ▶ 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-storm water discharge.
- ▶ Look for runoff bypassing ends of berms or undercutting berms.
- ▶ Repair or replace damaged areas of the berm and remove accumulated sediment.
- ▶ Recompect soil around berm as necessary to prevent piping.





**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. See related Geotextiles and Mats BMP Fact Sheet (GM).

**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.
- ▶ On steep slopes in which planting and mulching alone may not be as 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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

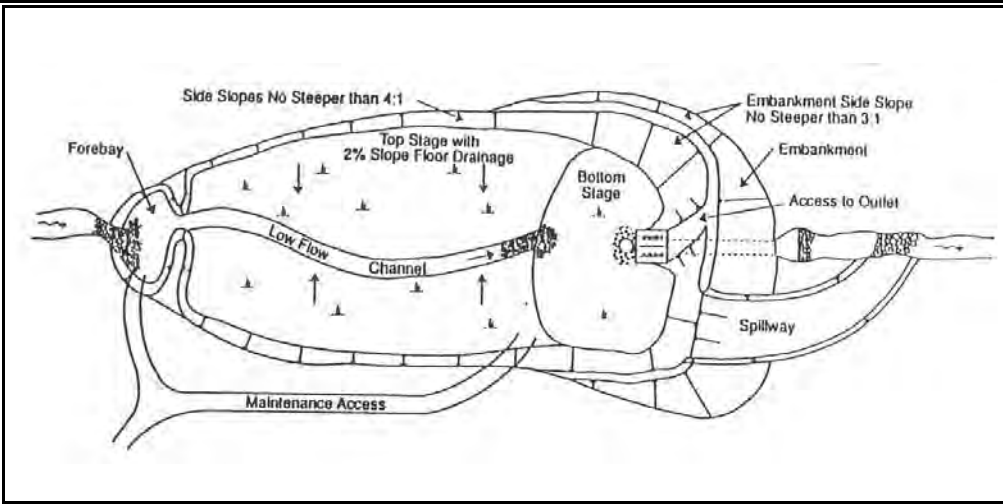
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**CONSIDERATIONS**

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

**DESCRIPTIONS:**

Extended detention basins are dry between storms. During a storm the basin fills. A bottom outlet releases the storm water slowly to provide time for sediments to settle.

**APPLICATION:**

- ▶ Objective is to remove only particulate pollutants.
- ▶ Use where lack of water prevents the use of wet ponds, wetlands or biofilters.
- ▶ Use where wet ponds or wetlands would cause unacceptable mosquito conditions.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Basin volume is sized to capture a particular fraction of the runoff.
- ▶ Drawdown time of 24 to 40 hours is required.
- ▶ A shallow basin with large surface area performs better than a deep basin with the same volume.
- ▶ Place energy dissipater at the entrance to minimize bottom erosion and resuspension.
- ▶ Vegetate side slopes and bottom to the maximum extent practical.
- ▶ If side erosion is particularly severe, consider paving or soil stabilization.
- ▶ If floatables are a problem, protect outlet with a trash rack or other device.
- ▶ Provide bypass or pass through capabilities for 100-year storm.

**LIMITATIONS:**

- ▶ May be less reliable than other treatment control BMPs. Inability to vegetate banks and bottom may result in erosion and resuspension.
- ▶ Limitation of the orifice diameter may preclude use in small watersheds.
- ▶ Requires differential elevation between inlet and outlet.

**MAINTENANCE:**

- ▶ Check outlet regularly for clogging.
- ▶ Check banks and bottom of basin for erosion and correct as necessary.
- ▶ Remove sediment when accumulation reaches 6-inches, or if resuspension is observed.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

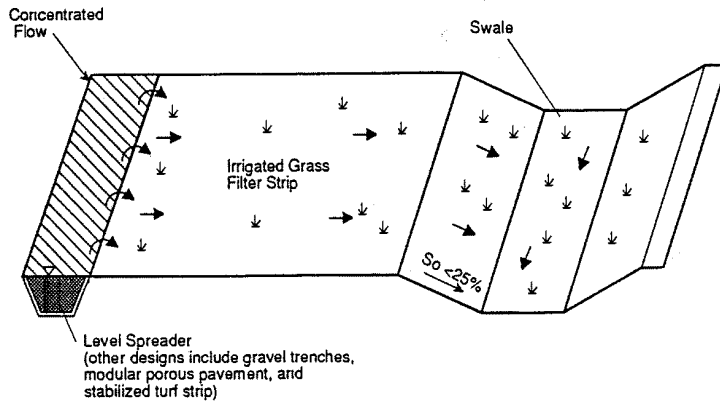
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**GENERAL DESCRIPTION:**

Filter strips are 20-foot-wide strips of natural or planted vegetation around a construction site. They are designed to cause deposition of sediments within the vegetation layer.

**APPLICATIONS:**

- ▶ Suited for areas where the soils are well drained or moderately well drained.
- ▶ Areas where the bedrock and the water table are well below the surface.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Make sure the vegetative cover is dense enough to protect underlying soil while causing sediment to settle.
- ▶ Filter strip must be approximately 20 feet wide to function well.
- ▶ The length should be approximately 50 to 75 feet. Where slopes become steeper the length of the strip must be increased.

**LIMITATIONS:**

- ▶ Only applicable in areas where vegetation is previously established or where sod is added.
- ▶ Vegetated filter strips will not function well on steep slopes, in hilly areas, or in highly paved areas.
- ▶ Sites with slopes of 15 percent or more may not be suitable for filtering storm water flows.

**MAINTENANCE:**

- ▶ Check for channels and repair.
- ▶ Provide rock aprons to aid in slowing flow if necessary.
- ▶ Maintain vegetation at optimal height and thickness.

**TARGETED POLLUTANTS**

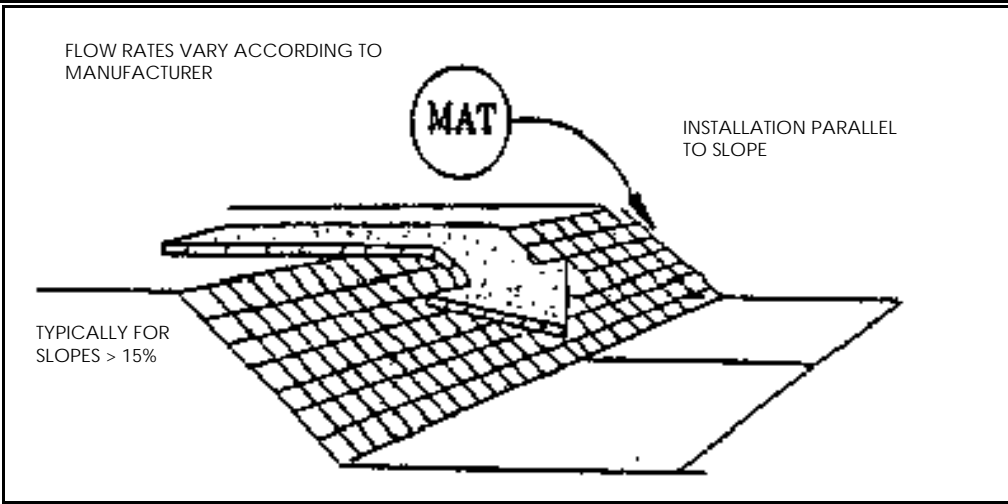
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Mattings made of natural or synthetic material which are used to temporarily or permanently stabilize soil. See the related Erosion Control Blankets BMP Fact Sheet (ECB).

**APPLICATION:**

- ▶ Typically suited for post-construction site stabilization, but may be used for temporary stabilization of highly erosive soils.
- ▶ Channels and streams.
- ▶ Steep slopes.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Mattings may be applied to disturbed soils and where existing vegetation has been removed.
- ▶ The following organic matting materials provide temporary protection until permanent vegetation is established, or when seasonal circumstances dictate the need for temporary stabilization until weather or construction delays are resolved: Jute mattings and straw mattings.
- ▶ The following synthetic mattings may be used for either temporary or post-construction stabilization, both with and without vegetation: excelsior matting, glass fiber matting, mulch matting.
- ▶ Staples are needed to anchor the matting.

**LIMITATIONS:**

- ▶ Mattings are more costly than other BMP practices, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- ▶ May delay seed germination, due to reduction in soil temperature.
- ▶ Installation requires experienced contractor to ensure soil stabilization and erosion protection.

**MAINTENANCE:**

- ▶ Inspect monthly and after significant rainfall.
- ▶ Re-anchor loosened matting and replace missing matting and staples as required.

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**Soils exposed from land grading activities are very vulnerable to erosion**

**OBJECTIVES**

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

**DESCRIPTION:**

Control soil erosion by minimizing the exposure of bare soil to erosive forces. This is done by

- 1) limiting the amount of land disturbed at one time in preparation for construction
- 2) limiting the amount of time between the disturbance of soil and protection or stabilization of disturbed soils, and
- 3) using grading practices to protect exposed soils susceptible to storm water runoff.

Related practices include construction sequencing, preservation of existing vegetation, erosion control practices and sediment control practices.

**APPROACH:**

- Limit the area of disturbance to those areas requiring grading. This preserves existing vegetation and reduces the vulnerability of soil to erosion.
- Based on erosion potential and sediment control measures on the site, establish what areas are to be graded at one time.
- An undisturbed buffer zone containing vegetation at the lowest elevation of a construction site can reduce the transport of sediment off site.
- Initiate soil protection measures during the course of work to minimize the length of time soil is exposed to erosive forces.
- Conduct work in stages so that construction or soil stabilization occurs promptly after disturbance of soil.
- Establish a schedule governing the stabilization of disturbed slopes, both in terms of passage of time since commencement and completion of disturbance and in terms of planting season.
- Leaving the surface of the disturbed soil graded in a roughened condition (not smooth) can reduce the quantity and velocity of storm water runoff.
- Prevent storm water runoff from running onto steep slopes from above.
- Avoid long, steep cut or fill slopes that allow runoff water of sufficient quantity or velocity to cut into and erode the slope.

**LIMITATIONS:**

- The specific approach to grading on a particular site depends on the conditions of the site and surrounding land; engineering judgment is required to design the approach best suited for each site.

**MAINTENANCE:**

- Practices may need to vary from the approved plan if erosion problems appear when storm water runoff occurs.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**Grassed swales can be used along roadsides and parking lots to collect and treat storm water runoff**

**APPLICATIONS**

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

**DESCRIPTION:**

A series of vegetated, open channel management practices designed specifically to treat and attenuate storm water runoff. Storm water is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils.

**APPROACH:**

- Grassed swales can be applied in most situations with some restrictions. Swales are very well suited for treating highway or residential road runoff because they are linear practices.
- Grassed swales should be used on sites with relatively flat slopes of less than 4 percent slope; 1 to 2 percent slope is recommended.
- A small fore-bay should be used at the front of the swale to trap incoming sediments. A pea gravel diaphragm, a small trench filled with river run gravel, should be used as pretreatment for runoff entering the sides of the swale.
- Swales should also have the capacity to pass larger storms (typically a 10-year storm) safely.

**LIMITATIONS:**

- Grassed swales cannot treat a very large drainage area.
- Wet swales may become a nuisance due to mosquito breeding.

**MAINTENANCE:**

Maintenance of grassed swales mostly involves maintenance of the grass or wetland plant cover.



**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

A combination of wood fiber mulch, processed grass, or hay or straw mulch and a tacking agent. It is made into a slurry, then applied to bare slopes or other bare areas to provide temporary stabilization.

**APPLICATIONS:**

- ▶ Small roadside slopes.
- ▶ Large, relatively flat areas.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Legume seeds should be pellet inoculated with the appropriate bacteria.
- ▶ The seed should not remain in the hydromulcher tank for more than 30 minutes.
- ▶ Wood fiber may be dyed to aid in uniform application.
- ▶ Slurry should be uniformly applied until an adequate coverage is achieved.
- ▶ The applicator should not be directed at one location for a long period of time; erosion will occur.

**LIMITATIONS:**

- ▶ Will lose effectiveness after 1 year.
- ▶ Can use only on physically stable slopes (at natural angle of repose, or less).

**MAINTENANCE:**

- ▶ Periodically inspect for damage caused by wind, water, or human disturbance.
- ▶ Promptly repair damaged areas.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**PROGRAM ELEMENTS**

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

**DESCRIPTION:**

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees. Another important aspect of this BMP is to insure the use of sub-consultants who are properly licensed and trained.

**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 greases; 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 PCBs.

**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 collector.

**MAINTENANCE:**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

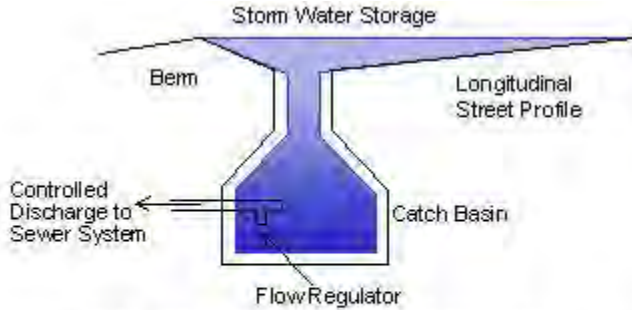
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low





Note: Not to scale and great vertical exaggeration

**Catch basins can be equipped with flow restrictors to temporarily detain storm water in the conveyance system**

**APPLICATIONS**

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

**DESCRIPTION:**

In-line storage refers to a number of practices designed to use the storage within the storm drain system to detain flows. While these practices can reduce storm peak flows, they are unable to improve water quality or protect downstream channels. Devices can slow the rate of flow by backing up flow, as in the case of a dam or weir, or through the use of vortex valves, devices that reduce flow rates by creating a helical flow path in the structure.

**APPROACH:**

- In-line storage practices serve the same purpose as traditional detention basins
- These practices can act as a surrogate for aboveground storage when little space is available for aboveground storage facilities.

**LIMITATIONS:**

- In-line storage practices only control flow, and thus are not able to improve the water quality of storm water runoff.
- If improperly designed, these practices may cause upstream flooding.
- Flow regulators cannot be applied to all storm drain systems. In older cities, the storm drainpipes may not be oversized, and detaining storm water within them would cause upstream flooding.

**MAINTENANCE:**

- Flow regulators require very little maintenance, because they are designed to be "self-cleaning," much like the storm drain system.
- For some designs, such as check dams, regulations will require only moderate construction in order to modify the structure's design.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

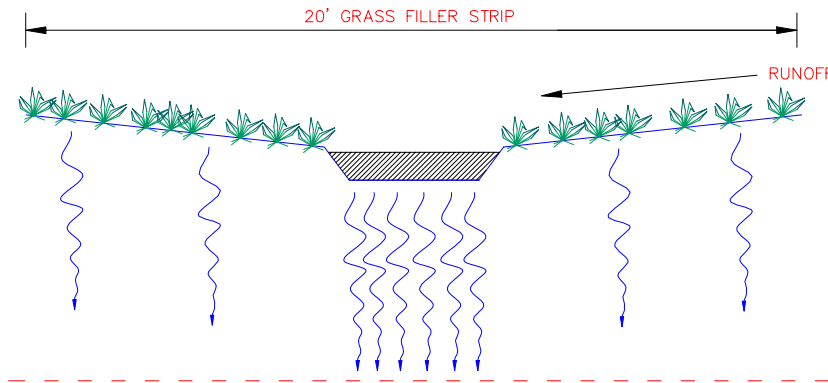
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**CONSIDERATIONS**

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

**DESCRIPTION:**

A family of systems in which the majority of the runoff from small storms is infiltrated into the ground rather than discharged to a surface water body. Infiltration systems include: ponds, vaults, trenches, dry wells, porous pavement, and concrete grids.

**APPLICATION:**

Suitable site soils and geologic conditions; low potential for long-term erosion in the watershed.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Volume sized to capture a particular fraction of annual runoff.
- ▶ Pretreatment is necessary in fine soils.
- ▶ Emergency overflow or bypass for larger storms is needed.
- ▶ Observation wells are required in trenches.
- ▶ Infiltration surface must be protected during construction.
- ▶ Pond sides need vegetation to prevent erosion.
- ▶ During construction frequent inspection for clogging is necessary.
- ▶ Line sides of trench with permeable filter fabric
- ▶ Trench should be filled with clean washed stone or gravel. (1.5-3.0 in.)
- ▶ A six inch sand filter layer; cloth lines the bottom of trench.

**LIMITATIONS:**

- ▶ Loss of infiltrative capacity and high maintenance cost in fine soils.
- ▶ Low removal of dissolved pollutants in very coarse soils.
- ▶ Not suitable on fill sites or steep slopes.
- ▶ The risk of ground water contamination in very coarse soils, may require ground water monitoring.

**MAINTENANCE:**

- ▶ Remove sediment at a frequency appropriate to avoid excessive concentrations of pollutants and loss of infiltrative capacity.
- ▶ Frequent cleaning of porous pavements is required.
- ▶ Maintenance is difficult and costly for underground trenches.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

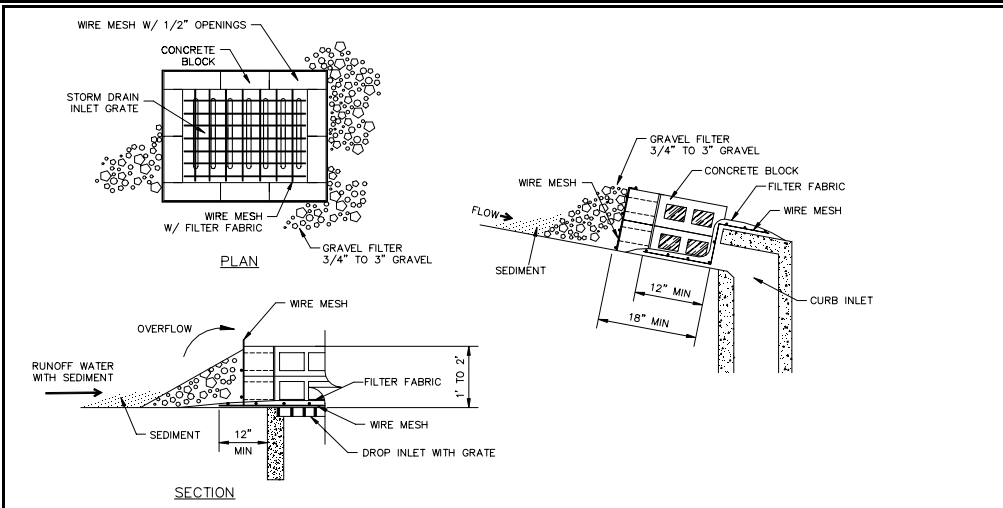
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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

**DESCRIPTION:**

Concrete block and gravel filter placed over inlet to storm drain system.

**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 1/2 inch openings) over the inlet grate extending one foot past the grate in all directions.
- ▶ Place concrete blocks around the inlet with openings facing outward. Stack blocks to minimum height of 12-inches and maximum height of 24-inches.
- ▶ Place wire mesh around outside of blocks.
- ▶ Place gravel (3/4" to 3") around blocks.

**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.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

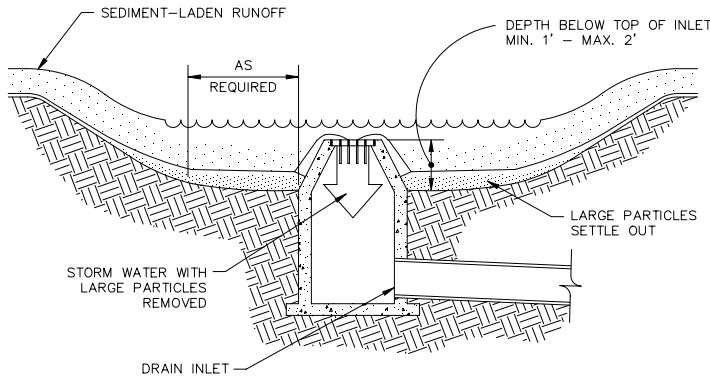
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**DESCRIPTION:**

An area excavated around a storm drain inlet to impound water below the inlet.

**APPLICATION:**

Construct at storm drainage inlets located downgradient of areas to be disturbed by construction (for inlets in paved areas see other information sheets for inlet protection).

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Provide upgradient sediment controls, such as silt fence during construction of inlet.
- ▶ When construction of inlet is complete, excavate adjacent area 1 to 2 feet lower than the grate elevation. Size of excavated area should be based on soil type and contributing acreage.

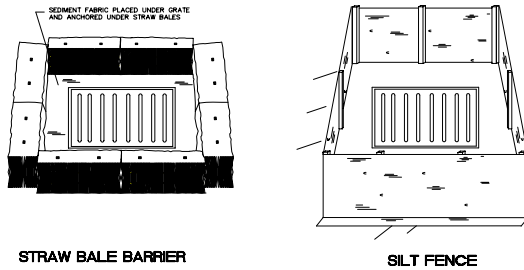
**LIMITATIONS:**

- ▶ Recommended maximum contributing drainage area of one acre.
- ▶ Limited to inlets located in open unpaved areas.
- ▶ Requires flat area adjacent to inlet.

**MAINTENANCE:**

- ▶ Inspect inlet protection following storm event and at a minimum of once monthly.
- ▶ Remove accumulated sediment when it reaches one half of the excavated sump below the grate.
- ▶ Repair side slopes as required.

**INLET PROTECTION**



SEE INDIVIDUAL BMP INFORMATION SHEETS FOR INSTRUCTIONS FOR CONSTRUCTION OF STRAW BALE BARRIER AND SILT FENCE..

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Sediment barrier erected around storm drain inlet.

**APPLICATION:**

Construct at storm drainage inlets located downgradient of areas to be disturbed by construction (for inlets in paved areas see other information sheets for inlet protection)

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Provide upgradient sediment controls, such as silt fence during construction of inlet.
- ▶ When construction of inlet is complete, erect straw bale barrier or silt fence surrounding perimeter of inlet. Follow instructions and guidelines on individual BMP information sheets for straw bale barrier and silt fence construction.

**LIMITATIONS:**

- ▶ Recommended maximum contributing drainage area of one acre.
- ▶ Limited to inlets located in open unpaved areas.
- ▶ Requires shallow slopes adjacent to inlet.

**MAINTENANCE:**

- ▶ Inspect inlet protection following storm event and at a minimum of once monthly.
- ▶ Remove accumulated sediment when it reaches 4-inches in depth.
- ▶ Repair or realign barrier/fence as needed.
- ▶ Look for bypassing or undercutting and recompact soil around barrier/fence as required.

**TARGETED POLLUTANTS**

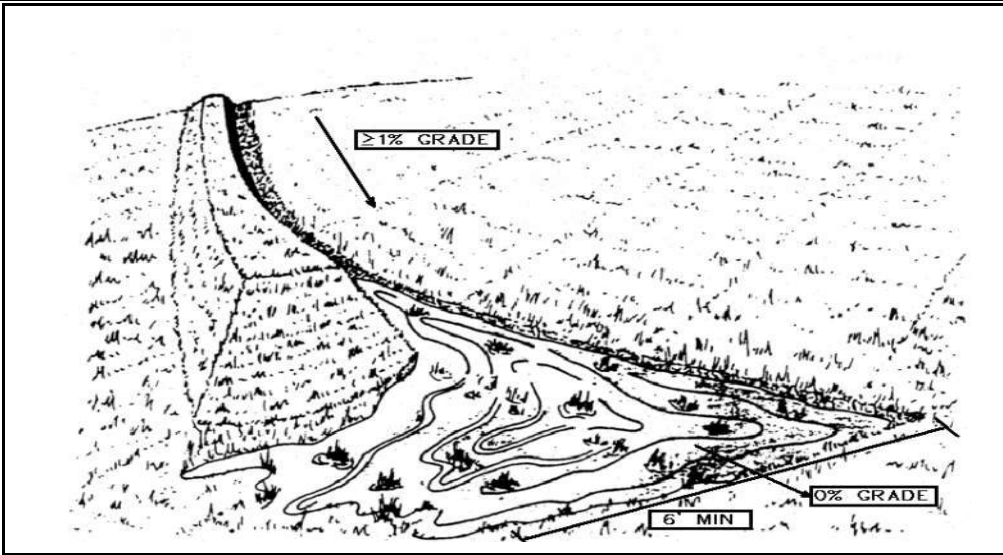
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

Level spreaders are devices used at storm water outlets to spread out collected storm water flows into sheet flow (runoff that flows over ground surface in a thin, even layer). Typically, a level spreader consists of a depression in the soil surface that spreads the flow onto a flat area across a gentle slope. Level spreaders then release the storm water flow onto level areas stabilized by vegetation to reduce speed and increase infiltration.

**APPLICATION:**

Level spreaders are most often used as an outlet for temporary or permanent storm water conveyances or dikes. Runoff that contains high sediment loads should be treated in a sediment trapping device prior to release into a level spreader.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ The length of the spreader depends upon the amount of water that flows through the conveyance.
- ▶ Larger volumes of water need more space to even out.
- ▶ Level spreaders are generally used with filter strips (see Filter Strips BMP).
- ▶ The depressions are seeded with vegetation (see Permanent & Temporary Seeding BMP).
- ▶ Level spreaders should be constructed on natural soils and not on fill material.
- ▶ The entrance to the spreader should be level so that the flow can spread out evenly.
- ▶ Level Spreader should have a grade of 0%; minimum width should be 6'.

**LIMITATIONS:**

- ▶ Can easily develop "short circuiting" (concentration of flows into small streams instead of sheet flow over the spreader) because of erosion or other disturbance.
- ▶ Cannot handle large quantities of sediment-laden storm water.

**MAINTENANCE:**

- ▶ The spreader should be inspected after every storm event to check for damage.
- ▶ If ponding or erosion channels develop, the spreader should be regraded.
- ▶ Dense vegetation should be maintained and damaged areas reseeded as needed.

**CONSIDERATIONS**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

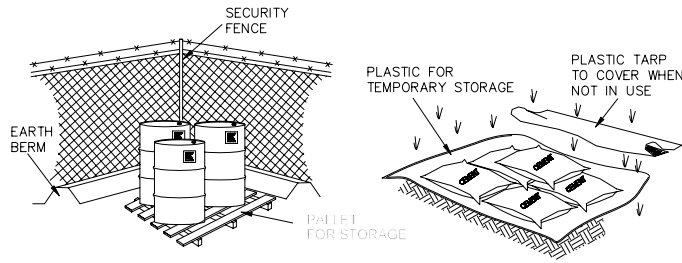
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



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

**OBJECTIVES**

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

**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.
- ▶ Verify that 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.



Adapted from Salt Lake City BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

**DESCRIPTION:**

Placement of material such as straw, grass, woodchips, woodfibers or fabricated matting over open area.

**APPLICATION:**

- ▶ Any exposed area to remain untouched longer than 14 days and that will be exposed less than 60 days (seed areas to be exposed in excess of 60 days).
- ▶ Areas that have been seeded.
- ▶ Stockpiled soil material.

Material	Application	Depth	Comments
<u>Gravel:</u> Washed 1/4" to 1-1/2"	9 cy/1000 sf	3 inches	Good for traffic areas Good for short slopes
<u>Straw:</u> Air-dried, free of seeds and coarse material	2-3 bales/1000 sf	2 inches min.	Subject to wind blowing Tack down or keep moist
<u>Wood Fiber Cellulose:</u> Free from growth inhibitors; dyed green	35 lb/1000 sf	1 inch	For critical areas, double application rate; Limit to slopes < 3% and < 150 feet

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Roughen area to receive mulch to create depressions that mulch material can settle into.
- ▶ Apply mulch to required thickness and anchor as necessary.
- ▶ Ensure material used is weed free and does not contain any constituents that will inhibit plant growth.

**LIMITATIONS:**

- ▶ Anchoring may be required to prevent migration of mulch material.
- ▶ Downgradient control may be required to prevent mulch material being transported to storm water system.

**MAINTENANCE:**

- ▶ Inspect mulched areas after every rainfall event and at a minimum of monthly.
- ▶ Replace mulch on any bare areas and reanchor as necessary.
- ▶ Clean and replace downgradient controls as necessary.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

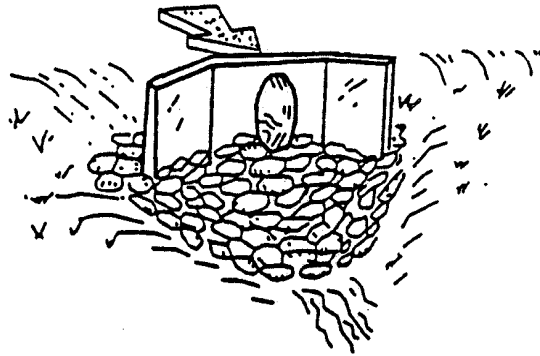
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low





**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**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.

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

# BMP: Parking Lot Sweeping/Vacuuming

PLSV



### PROGRAM ELEMENTS

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

### DESCRIPTION:

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

### APPROACH:

- ▶ Restrict parking prior to and during sweeping.
- ▶ Establish frequency of sweeping based on anticipated need and observations of debris or sediment accumulation
- ▶ Increase sweeping frequency just before the rainy season.
- ▶ Lots that generate greater amounts of debris or sediment must be swept more frequently. These include lots associated with or adjacent to recreational, commercial, or industrial areas, or other areas of high vehicle or pedestrian traffic.
- ▶ Manually remove debris from corners or other areas of the parking lot that equipment cannot reach
- ▶ Keep accurate operation logs to track programs.
- ▶ 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). It may be useful to have the ability to use both kinds.

### 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 parking lot conditions, presence of parked vehicles, presence of construction projects, climatic conditions and condition of curbs.

### MAINTENANCE:

- ▶ Acquisition and maintenance of equipment is generally handled by the company hired to perform the sweeping/vacuuming.



### TARGETED POLLUTANTS

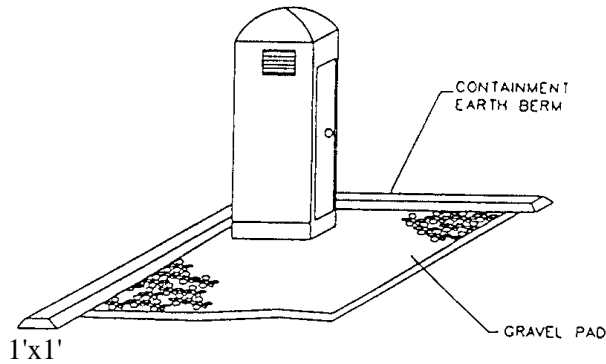
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

### IMPLEMENTATION REQUIREMENTS

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

- High     Medium     Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Temporary on-site sanitary facilities for construction personnel.

**APPLICATION:**

All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Locate portable toilets in convenient locations throughout the site.
- ▶ Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- ▶ Construct earth berm perimeter (See Earth Berm Barrier Information Sheet), control for spill/protection leak.
- ▶ Stake toilets to prevent them from tipping.

**LIMITATIONS:**

No limitations.

**MAINTENANCE:**

- ▶ Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- ▶ Regular waste collection should be arranged with licensed service.
- ▶ All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

**TARGETED POLLUTANTS**

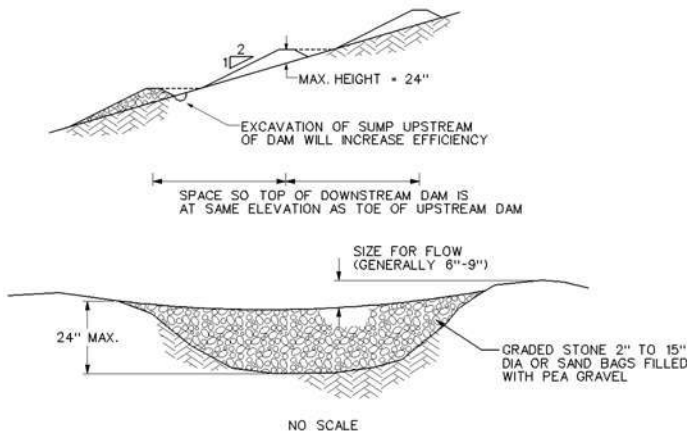
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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



**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

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**CONSIDERATIONS**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

Riprap is a permanent, erosion-resistant protective layer made of loose stones. It is intended to protect soil from erosion in areas of concentrated runoff. Riprap may also be used to stabilize slopes that are unstable because of seepage problems.

**APPLICATION:**

- ▶ Riprap is normally used at locations where erosive forces from water flow exceed the ability of the soil or vegetative cover to resist those forces.
- ▶ Riprap can be used for pipe outlet protection, channel lining, scour protection, etc.
- ▶ Riprap is commonly used for wave protection on lakes.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ For slopes steeper than 2:1, consider using materials other than riprap for erosion protection.
- ▶ If riprap is being planned for the bottom of a permanently flowing channel, the bottom can be modified to enhance fish habitat. This can be done by constructing riffles and pools which simulate natural conditions.
- ▶ When working within flowing streams, measures should be taken to prevent excessive turbidity and erosion during construction. Bypassing base flows or temporarily blocking base flows are two possible methods. Work should be done during a period of low flow.

In designing riprap consider the following:

- ▶ Use durable rock, such as granite, and a variety of rock sizes.
- ▶ The thickness of riprap layers should be at least 1.25 times the max. stone diameter.
- ▶ Filter material is usually required between riprap and the underlying soil surface.

**LIMITATIONS:**

- ▶ Riprap may be unstable on very steep slopes.
- ▶ The placement of a riprap in streams requires a state stream alteration permit.

**MAINTENANCE:**

- ▶ Riprap should be inspected annually and after major storms.
- ▶ If riprap has been damaged, repairs should be made promptly to prevent a progressive failure.
- ▶ If repairs are needed repeatedly at one location, the site should be evaluated to see if original design conditions have changed.

**TARGETED POLLUTANTS**

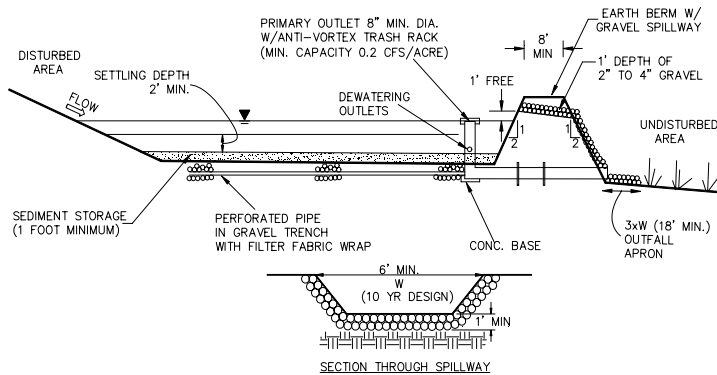
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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

**DESCRIPTION:**

A pond created by excavation or construction of an embankment, and designed to retain or detain runoff sufficiently to allow excessive sediment to settle.

**APPLICATION:**

- ▶ At the outlet of all disturbed watersheds 10 acres or larger.
- ▶ At the outlet of smaller disturbed watersheds, as necessary.
- ▶ Where post construction detention basins will be located.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Design basin for site specific location, maintain effective flow length 2 times width.
- ▶ Excavate basin or construct compacted berm containment, ensure no downgradient hazard if failure should occur. (Provide minimum of 67 cy. per acre of drainage area).
- ▶ Construct dewatering and outfall structure and emergency spillway with apron.

**LIMITATIONS:**

- ▶ Should be sized based on anticipated runoff, sediment loading and drainage area size.
- ▶ May require silt fence at outlet for entrapment of very fine silts and clays.
- ▶ May require safety fencing to prevent public access.
- ▶ Height restrictions for embankment regulated by Utah Division of Dam Safety.

**MAINTENANCE:**

- ▶ Inspect after each rainfall event and at a minimum of monthly.
- ▶ Repair any damage to berm, spillway or sidewalls.
- ▶ Remove accumulated sediment as it reaches 2/3 height of available storage.
- ▶ Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

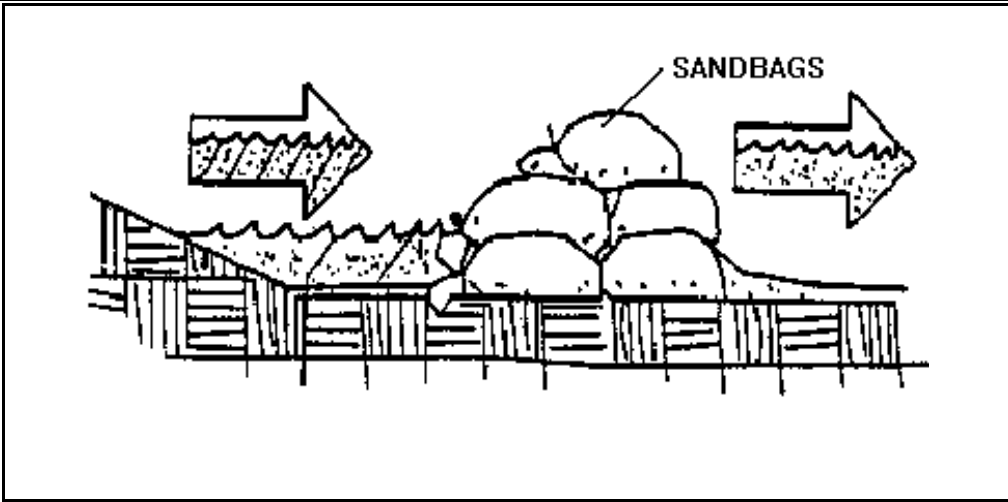
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

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

**APPLICATION:**

- ▶ Along the perimeter of the site.
- ▶ May be used in drainage areas up to 5 acres.
- ▶ Along streams and channels
- ▶ Across swales with small catchments.
- ▶ Around temporary spoil areas.
- ▶ Below the toe of a cleared slope.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Install along a level contour.
- ▶ Base of sand bag barrier should be at least 48 inches wide.
- ▶ Height of sand bag barrier should be at least 18 inches high.
- ▶ 4 inch PVC pipe may be installed between the top layer of sand bags to drain large flood flows.
- ▶ Provide area behind barrier for runoff to pond and sediment to settle.
- ▶ Place below the toe of a slope.

**LIMITATIONS:**

- ▶ Sand bags are more expensive than other barriers, but also more durable.
- ▶ Burlap should not be used.

**MAINTENANCE:**

- ▶ Inspect after each rain.
- ▶ Reshape or replace damaged sand bags immediately.
- ▶ Replace sediment when it reaches six inches in depth.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**PROGRAM ELEMENTS**

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

**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.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

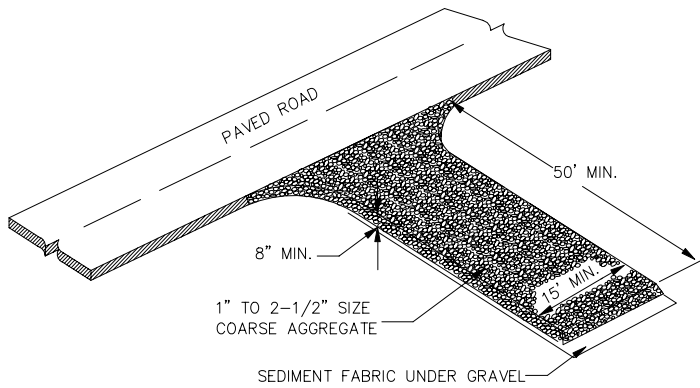
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low





**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface. The area can be used to spray off vehicles before they leave the site.

**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.
- ▶ Provide water to the area that can be used to spray off vehicles as needed to prevent the tracking of mud off of the construction site. This may not be needed during dry periods of work, but is needed when construction is proceeding under wet conditions.
- ▶ Provide berming as needed to prevent sediment laden wash water from entering storm water facilities or other water bodies, or leaving the site.

**LIMITATIONS:**

- ▶ Requires periodic top dressing with additional stones.
- ▶ Should be used in conjunction with street sweeping on adjacent public right-of-way.
- ▶ Must be situated such that waste water does not run off site.

**MAINTENANCE:**

- ▶ Inspect daily for loss of gravel or sediment buildup.
- ▶ Inspect adjacent roadway for sediment deposit and clean by shoveling and sweeping.
- ▶ 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**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

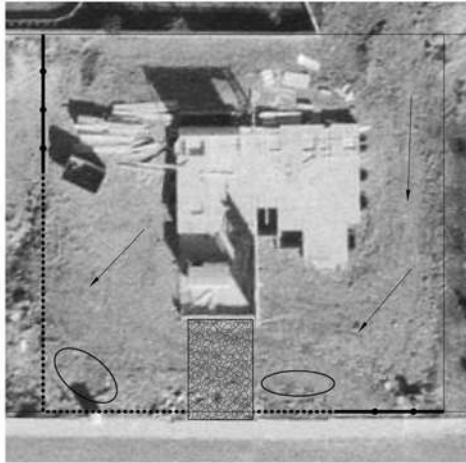
**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

# BMP: Sediment Control on Small Construction Sites

SCSCS



## APPLICATIONS

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

## DESCRIPTION:

Control the perimeter, vehicular access, and the delivery of materials to small construction sites so that sediment, landscaping materials and other construction debris is not in the street. This BMP is intended to be applied to residential construction sites and small nonresidential sites.

## APPROACH:

- Prior to any building construction on a site, identify the point of access to the property. This should generally be the location of the future driveway. Fence the remainder of the street frontage of the property, as well as side lot lines (as far as necessary to prevent access) with temporary fencing (silt fence may be used where silt fence is needed). This fencing is to remain in place until all construction or landscape material deliveries are complete. **No access is to be made at any point other than the designated point of access.**
- Control the perimeter of the site so that sediment-laden storm water does not leave the site during construction. This may involve sediment control measures such as silt fences, drainage swales or berms, straw or hay bale barriers, or rock check dams.
- Either utilize the curb cut or leave the curb, gutter and sidewalk in place (and replace it if needed when work is complete). **Do not place anything in the gutter, including dirt ramps.**
- Excavate for and place a bed of gravel or drain rock the full width of the future driveway (16' minimum), a distance of 27 feet back from the back of sidewalk. Place the rock to the depth necessary to prevent material delivery vehicles from contacting the on-site soils.
- At the proper time, the gravel or rock bed can be modified to serve as the base for concrete driveway placement. At that point, the concrete driveway will prevent delivery and other vehicles from coming into contact with on-site soils.

## LIMITATIONS:

- It may be necessary to pump concrete to locations away from the bed of gravel or rock.
- Parking of workers' vehicles may require that the bed of gravel or rock be enlarged to make space for vehicle parking that keeps the vehicles from contacting the on-site soils.
- Builders, subcontractors, material suppliers, vendors and other visitors to the site must be educated to adhere to the practices outlined.
- Landscaping and construction materials must be placed on the lot, not the street or walk.

## MAINTENANCE:

- Repair fencing as needed to maintain control of access.
- Repair sediment control measures as needed during construction.
- Replenish and dress up the gravel/rock area as needed during the course of construction.
- Any tracking of soil onto the adjacent street indicates inadequate performance of this BMP. Remove soil tracked onto the street at the end of any day that it occurs and take corrective measures to prevent soil tracking onto the street from recurring.



## TARGETED POLLUTANTS

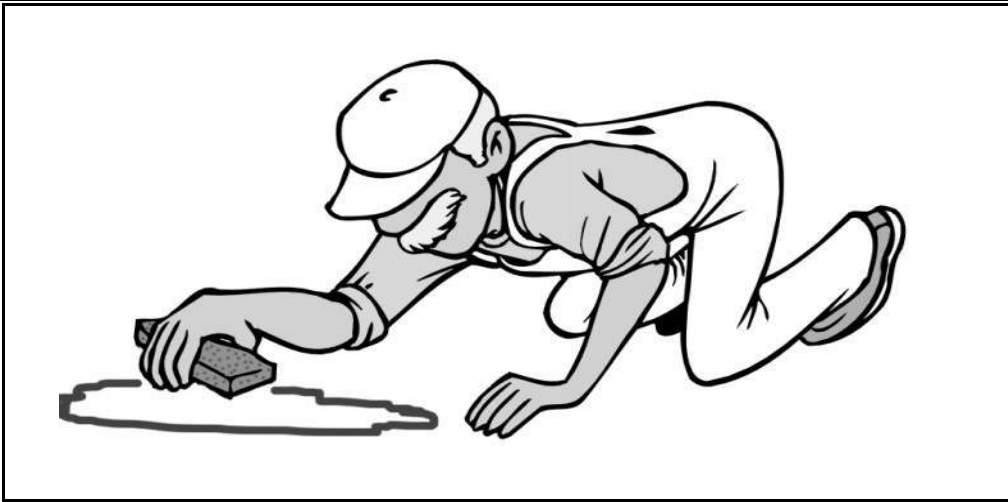
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

## IMPLEMENTATION REQUIREMENTS

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

- High
- Medium
- Low



**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 #801-536-4100) 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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

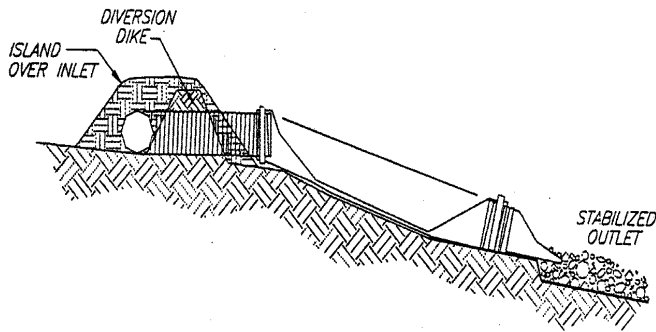
- Sediment
- Nutrients
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- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

A temporary pipe or lined channel that drains the top of a slope to a stable discharge point at the bottom of a slope without causing erosion.

**APPLICATIONS:**

- ▶ Where concentrated flow of surface runoff must be conveyed down a slope in order to prevent erosion.
- ▶ Drainage for top slope diversion dikes or swales.
- ▶ Emergency spillway for a sediment basin.
- ▶ Drainage for top of cut/fill slopes where water can accumulate.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Secure inlet and surround with dikes to prevent gully erosion, and anchor pipe to slope.
- ▶ Size to convey at least the peak of a 10-year, storm event.
- ▶ Stabilize outlet. (See Outlet Protection BMP).

**LIMITATIONS:**

- ▶ Maximum drainage area per slope drain is 5 acres.
- ▶ Clogged slope drains will force water around the pipe and cause slope erosion.
- ▶ Dissipation of high flow velocities at the pipe outlet is required to avoid downstream erosion.
- ▶ Failure can result in flooding and severe erosion.

**MAINTENANCE:**

- ▶ Structure must be inspected weekly and after storms.
- ▶ Inlet must be free of undercutting and no water should circumvent the entry.
- ▶ Outlet should not produce erosion; velocity dissipaters must be maintained.
- ▶ Pipe anchors must be checked to ensure that the pipe remains anchored to the slope.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

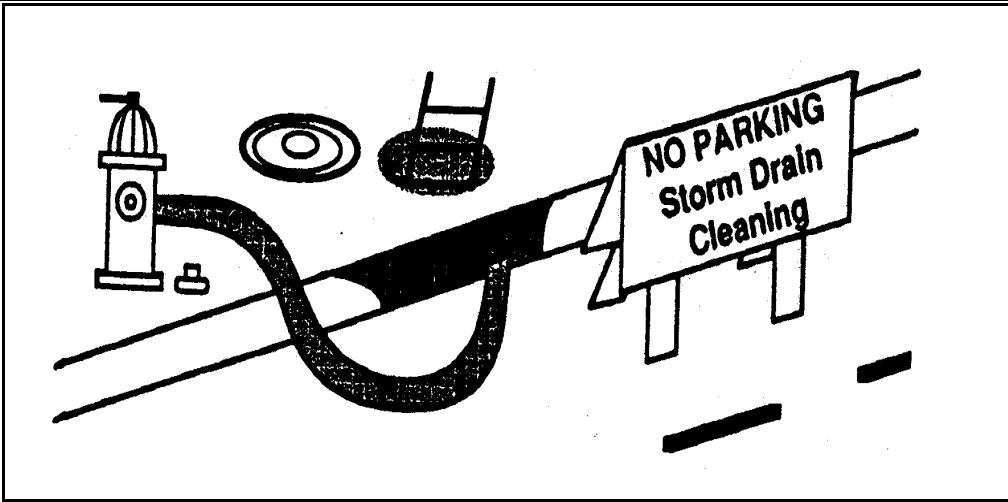
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- Nutrients
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- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

A storm drain is “flushed” with water to suspend and remove deposited materials. Flushing is particularly beneficial for storm drain pipes with grades too flat to be self-cleansing. Flushing helps ensure pipes convey design flow and remove pollutants from the storm drain system.

**APPROACH:**

- ▶ Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- ▶ Whenever possible, flushed effluent should be collected, decanted, evaporated, and disposed of in a landfill.

**LIMITATIONS:**

- ▶ Most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity).
- ▶ Water source must be available.
- ▶ May have difficulty finding downstream area to collect sediments.
- ▶ Requires liquid/sediment disposal.

**PROGRAM ELEMENTS**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

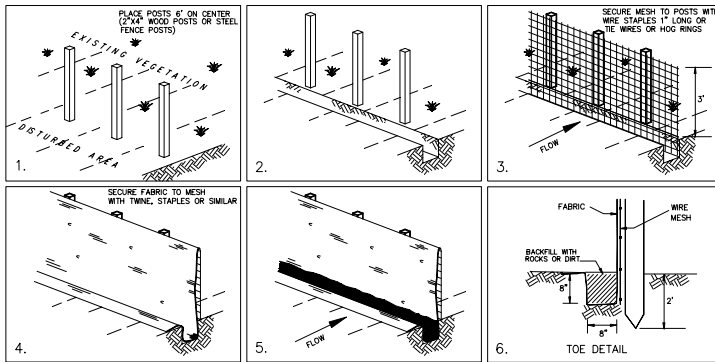
- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Oxygen Demanding Substances
- Oil & Grease
- Floatable Materials
- Bacteria & Viruses

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**OBJECTIVES**

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

**DESCRIPTION:**

A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.

**APPLICATION:**

- ▶ Perimeter control: place barrier at downgradient limits of disturbance
- ▶ Sediment barrier: place barrier at toe of slope or soil stockpile
- ▶ Protection of existing waterways: place barrier near top of stream bank
- ▶ Inlet protection: place fence surrounding catchbasins

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately upgradient of posts.
- ▶ Secure wire mesh (14 gage min. With 6 inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- ▶ Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- ▶ Backfill trench over filter fabric to anchor.

**LIMITATIONS:**

- ▶ Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- ▶ Recommended maximum upgradient slope length of 150 feet
- ▶ Recommended maximum uphill grade of 2:1 (50%)
- ▶ Recommended maximum flow rate of 0.5 cfs
- ▶ Ponding should not be allowed behind fence

**MAINTENANCE:**

- ▶ Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- ▶ Look for runoff bypassing ends of barriers or undercutting barriers.
- ▶ Repair or replace damaged areas of the barrier and remove accumulated sediment.
- ▶ Reanchor fence as necessary to prevent shortcutting.
- ▶ Remove accumulated sediment when it reaches 1/2 the height of the fence.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

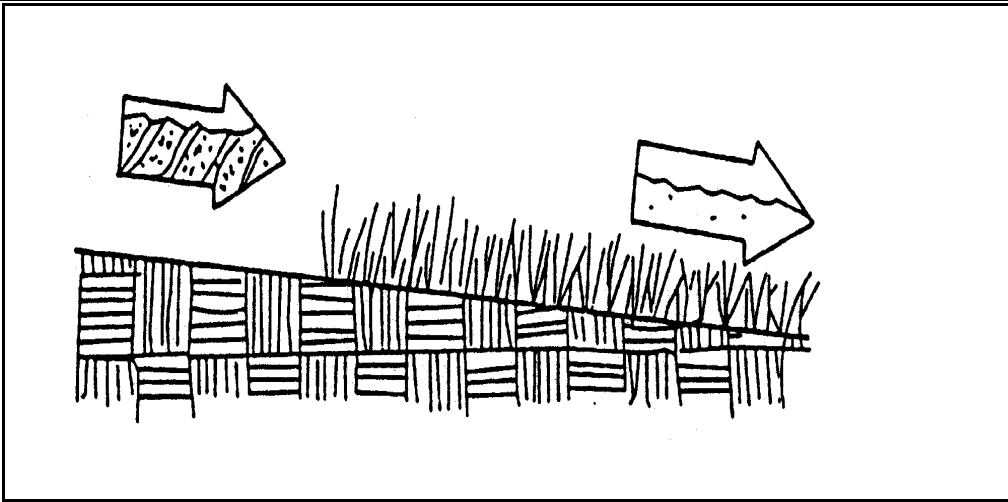
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

Seeding of grass and plantings of trees, shrubs, vines and ground covers provide long-term stabilization of soil. Grasses can be planted for temporary stabilization.

**APPLICATION:**

- ▶ Appropriate for site stabilization both during construction and post-construction.
- ▶ Any graded/cleared areas where construction activities have ceased.
- ▶ Open space cut and fill areas.
- ▶ Steep slopes, spoil piles, vegetated swales, landscape corridors, stream banks.

**INSTALLATION/APPLICATION CRITERIA:**

Type of vegetation, site and seedbed preparation, planting time, fertilization and water requirements should be considered for each application.

Grasses:

- ▶ Ground preparation: fertilize and mechanically stabilize the soil.
- ▶ Tolerant of short-term temperature extremes and waterlogged soil composition.
- ▶ Appropriate soil conditions: shallow soil base, good drainage, slope 2:1 or flatter.
- ▶ Mowing, irrigating, and fertilizing are vital for promoting vigorous grass growth.

Trees and Shrubs:

- ▶ Selection criteria: vigor, species, size, shape & wildlife food source.
- ▶ Soil conditions: select species appropriate for soil, drainage & acidity.
- ▶ Other factors: wind/exposure, temperature extremes, and irrigation needs.

Vines and Ground Covers:

- ▶ Ground preparation: lime and fertilizer preparation.
- ▶ Use proper seeding rates.
- ▶ Appropriate soil conditions: drainage, acidity and slopes.
- ▶ Generally avoid species requiring irrigation.

**LIMITATIONS:**

- ▶ Permanent and temporary vegetation may not be appropriate in dry periods without irrigation.
- ▶ Fertilizer requirements may have potential to create stormwater pollution.

**MAINTENANCE:**

- ▶ Shrubs and trees must be adequately watered and fertilized and if needed pruned.
- ▶ Grasses may need to be watered and mowed.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

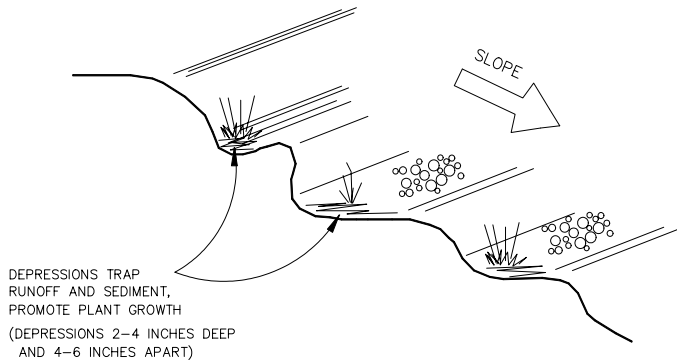
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DESCRIPTION:**

Rough preparation of working areas leaving depressions and uneven surface. Depressions should be done parallel to contours.

**APPLICATION:**

Surface roughening is appropriate for all construction that will not be receiving impervious cover within 14 days and that will be exposed less than 60 days (seed areas to be open in excess of 60 days).

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Surface should be left in rough condition during initial earthwork activity.
- ▶ Surfaces that have become smoothed or compacted due to equipment traffic should be roughened by use of disks, spring harrows, teeth on front end loader, or similar, operating along the contours of the slope. Tracking (by crawler tractor driving up and down slope) may also be used to provide depressions parallel to contours.
- ▶ Avoid compaction of soils during roughening as this inhibits plant growth and promotes storm water runoff. Limit tracked machinery to sandy soil.
- ▶ Seed or mulch areas to be exposed in excess of 60 days.
- ▶ Employ dust controls (See Dust Control BMP Fact Sheet).

**LIMITATIONS:**

- ▶ Will not withstand heavy rainfall.
- ▶ Slopes steeper than 2:1 (50%) should be benched (See Benching BMP Fact Sheet).

**MAINTENANCE:**

- ▶ Inspect following any storm event and at a minimum of weekly.
- ▶ If erosion in the form of rills (small waterways formed by runoff) is evident, perform machine roughening of area.
- ▶ For vegetated slopes reseed areas that are bare or have been reworked.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

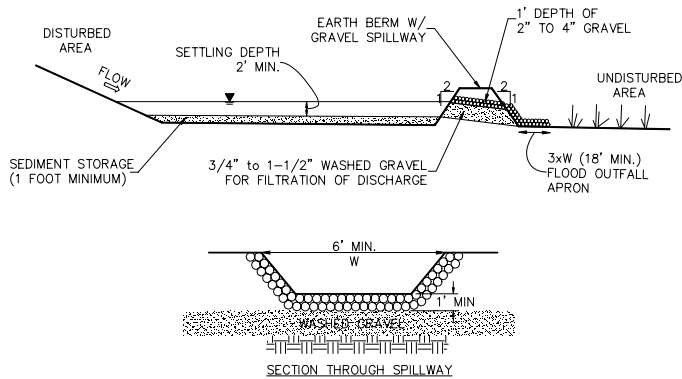
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low





**OBJECTIVES**

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

**DESCRIPTION:**

A sediment trap is a small excavated or bermed area where runoff from small drainage areas is detained and sediment can settle.

**APPLICATION:**

- ▶ Temporary control for runoff from disturbed areas of less than 3 acres.
- ▶ Temporary control for discharge from diversion dike, surface benching, or other temporary drainage measures.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Design basin for site specific location.
- ▶ Excavate basin or construct compacted berm containment.
- ▶ Construct outfall spillway with apron.
- ▶ Provide downstream silt fence if necessary.

**LIMITATIONS:**

- ▶ Should be sized based on anticipated runoff, sediment loading and drainage area size.
- ▶ May require silt fence at outlet for entrapment of very fine silts and clays.

**MAINTENANCE:**

- ▶ Inspect after each rainfall event and at a minimum of monthly.
- ▶ Repair any damage to berm, spillway or sidewalls.
- ▶ Remove accumulated sediment as it reaches 2/3 height of available storage.
- ▶ Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

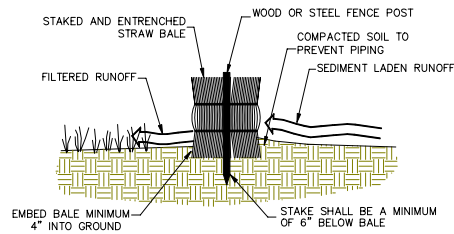
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

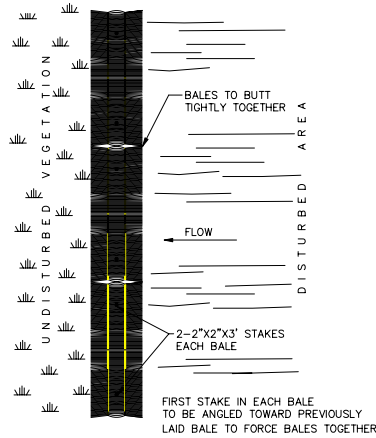
**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**SECTION**



**PLAN**

**DESCRIPTION:**

Temporary sediment barrier consisting of a row of entrenched and anchored straw bales.

**APPLICATION:**

- ▶ Perimeter Control: place barrier at downgradient limits of disturbance.
- ▶ Sediment barrier: place barrier at toe of slope or soil stockpile.
- ▶ Protection of existing waterways: place barrier near top of stream bank.
- ▶ Inlet Protection.

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Excavate a 4-inch minimum deep trench along contour line, i.e. parallel to slope, removing all grass and other material that may allow underflow.
- ▶ Place bales in trench with ends tightly abutting, fill any gaps by wedging loose straw into openings.
- ▶ Anchor each bale with 2 stakes driven flush with the top of the bale.
- ▶ Backfill around bale and compact to prevent piping, backfill on uphill side to be built up 4-inches above ground at the barrier.

**LIMITATIONS:**

- ▶ Recommended maximum area of 0.5 acre per 100 feet of barrier
- ▶ Recommended maximum upgradient slope length of 150 feet
- ▶ Recommended maximum uphill grade of 2:1 (50%)

**MAINTENANCE:**

- ▶ Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- ▶ Look for runoff bypassing ends of barriers or undercutting barriers.
- ▶ Repair or replace damaged areas of the barrier and remove accumulated sediment.
- ▶ Realign bales as necessary to provide continuous barrier and fill gaps.
- ▶ Recompress soil around barrier as necessary to prevent piping.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

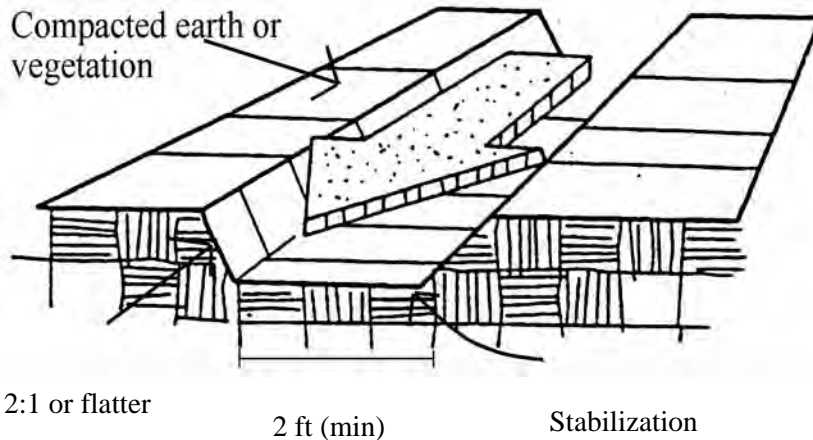
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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

**DESCRIPTION:**

Temporary drains and swales are used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff into sediment.

**APPLICATIONS:**

- ▶ Temporary drains and swales are appropriate for diverting any upslope runoff around unstabilized or disturbed areas of the construction site.
- ▶ Prevent slope failures. Prevent damage to adjacent property. Prevents erosion and transport of sediments into water ways. Increases the potential for infiltration. Diverts sediment-laden runoff into sediment basins or traps.

**INSTALLATION/APPLICATION:**

- ▶ Temporary drainage swales will effectively convey runoff and avoid erosion if built properly:
- ▶ Size temporary drainage swales using local drainage design criteria. A permanent drainage channel must be designed by a professional engineer (see the local drainage design criteria for proper design).
- ▶ At a minimum, the drain/swale should conform to predevelopment drainage patterns and capacities.
- ▶ Construct the drain/swale with an uninterrupted, positive grade to a stabilized outlet. Provide erosion protection or energy dissipation measures if the flow out of the drain or swale can reach an erosive velocity.

**LIMITATIONS:**

- ▶ Temporary drains and swales or any other diversion of runoff should not adversely impact upstream or downstream properties.
- ▶ Temporary drains and swales must conform to local floodplain management requirements.

**MAINTENANCE:**

- ▶ Inspect weekly and after each rain.
- ▶ Repair any erosion immediately.
- ▶ Remove sediment which builds up in the swale and restricts its flow capacity.



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**DEFINITION:**

Temporary seeding - establishment of short term cover by application of rapidly germinating seed mix (alternatively hydroseeding may be utilized).

Permanent seeding - establishment of final term cover by application of perennial seed mix (alternatively sod may be utilized).

**APPLICATION:**

Disturbed areas that are at final grade and which will not be disturbed by continuing activities on site. Also areas that are not at final grade but which will be left untouched in excess of one year.

**RECOMMENDED SEED MIX:**

The recommended seed mix will be dependent on site specific information such as elevation, exposure, soils, water available and topography. Check with the County Extension Service for recommended mixes for site specific conditions:

Utah State University Extension Service  
 51 South University Avenue, Suite 206  
 Provo, Utah 84601  
 phone (801) 370-8460

**LIMITATIONS:**

- ▶ Limited to areas that will not be subject to traffic or high usage.
- ▶ May require irrigation and fertilizer which creates potential for impacting runoff quality.
- ▶ May only be applied during appropriate planting season, temporary cover required until that time.

**INSTALLATION:**

- ▶ Roughen soil to a depth of 2 inches. Add fertilizer, manure, topsoil as necessary.
- ▶ Evenly distribute seed using a commonly accepted method such as broadcast seeding, drilling or hydroseeding.
- ▶ Use a seed mix appropriate for soil and location that will provide rapid germination and growth. Check with County Extension Service for recommended mix and application rate.
- ▶ Cover area with mulch if required due to steep slopes or unsuitable weather conditions.

**MAINTENANCE:**

- ▶ Provide irrigation as required to establish growth and to maintain plant cover through duration of project.
- ▶ Reseed as necessary to provide 75% coverage
- ▶ Remediate any areas damaged by erosion or traffic.
- ▶ When 75% coverage is achieved inspect monthly for damage and remediate as necessary.

**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

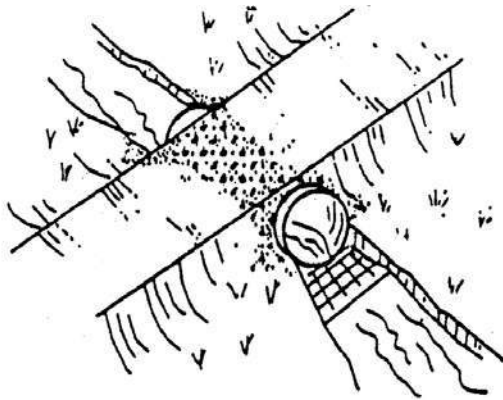
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

A temporary access stream crossing is a temporary culvert, ford or bridge placed across a waterway to provide access for construction purposes for a period of less than one year. Temporary access crossings are not intended to be used to maintain traffic for the general public.

**APPLICATIONS:**

Temporary stream crossings should be installed at all designated crossings of perennial and intermittent streams on the construction site, as well as for dry channels which may be significantly eroded by construction traffic.

**INSTALLATION/APPLICATION:**

Requires knowledge of stream flows and soil strength and should be designed under the direction of a Utah registered engineer with knowledge of both hydraulics and construction loading requirements for structures.

**LIMITATIONS:**

- ▶ May be expensive for a temporary improvement.
- ▶ Requires other BMP's to minimize soil disturbance during installation and removal.
- ▶ Fords should only be used in dry weather.
- ▶ A Stream Alteration Permit may be required, contact the Utah Division of Water Rights before implementation.

**MAINTENANCE:**

- ▶ Inspect weekly and after each significant rainfall, including assessment of foundations.
- ▶ Periodically remove silt from crossings.
- ▶ Replace lost aggregated from inlets and outlets of culverts.

**TARGETED POLLUTANTS**

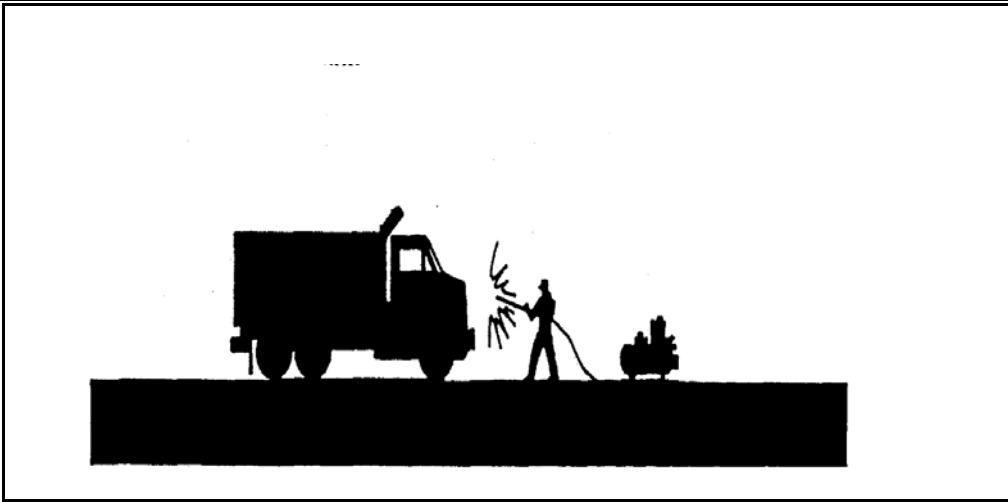
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**OBJECTIVES**

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



Adapted from Salt Lake County BMP Fact Sheet

**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**

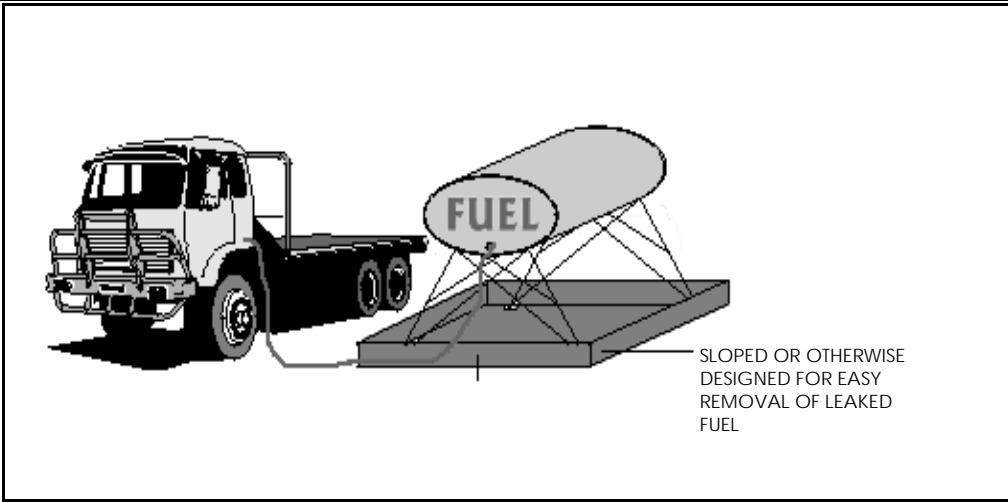
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High     Medium     Low



**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



Adapted from Salt Lake County BMP Fact Sheet

**TARGETED POLLUTANTS**

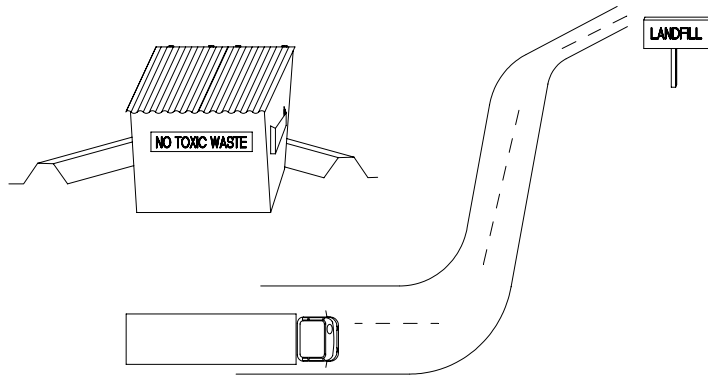
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low



**OBJECTIVES**

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

**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 BMP Fact 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).



Adapted from Salt Lake City BMP Fact Sheet

**TARGETED POLLUTANTS**

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

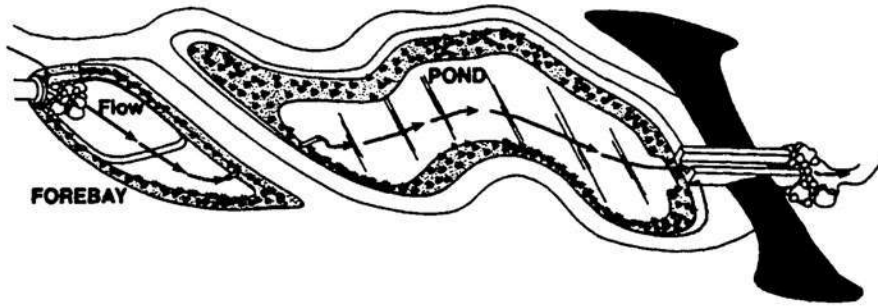
- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low





**CONSIDERATIONS**

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



Adapted from Salt Lake County BMP Fact Sheet

**DESCRIPTION:**

A wet pond has a permanent water pool to treat incoming stormwater. An enhanced wet pond includes a pretreatment sediment forebay.

**APPLICATION:**

- ▶ Need to achieve high level of particulate and some dissolved contaminant removal.
- ▶ Ideal for large, regional tributary areas.
- ▶ Multiple benefits of passive recreation (e.g. bird watching, wildlife habitat).

**INSTALLATION/APPLICATION CRITERIA:**

- ▶ Water depth of 3 to 9 feet.
- ▶ Wetland vegetation, occupying 25-50% of water surface area.
- ▶ Design to minimize short-circuiting.
- ▶ Bypass storms greater than two year storm.
- ▶ Establishing wetland vegetation may be difficult.

**LIMITATIONS:**

- ▶ Concern for mosquitoes and maintaining oxygen in ponds.
- ▶ Cannot be placed on steep unstable slopes.
- ▶ Need base flow or supplemental water if water level is to be maintained.
- ▶ Infeasible in very dense urban areas.
- ▶ May require permits from various regulatory agencies, e.g., Corps of Engineers.

**MAINTENANCE:**

- ▶ Remove floatables and sediment build-up.
- ▶ Correct erosion spots in banks.
- ▶ Control mosquitoes.

**TARGETED POLLUTANTS**

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

- High Impact
- Medium Impact
- Low or Unknown Impact

**IMPLEMENTATION REQUIREMENTS**

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

- High
- Medium
- Low

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

---

### APPENDIX G – MAINTENANCE AGREEMENT

THIS AGREEMENT entered into this \_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between PLEASANT GROVE CITY, a Municipal Corporation of Utah (hereinafter referred to as CITY), and \_\_\_\_\_, (hereinafter referred to as LAND OWNER), whose mailing address is

\_\_\_\_\_,  
\_\_\_\_\_

and telephone number is (\_\_\_\_\_) - \_\_\_\_ - \_\_\_\_\_.

WITNESSETH:

WHEREAS, the CITY has adopted a Storm Water Management Plan (hereinafter Management Plan) and established maintenance responsibilities for storm water management facilities on private property which connect to the CITY storm water system; and

WHEREAS, under said Management Plan the CITY has the authority to inspect private drainage systems within the CITY, and to order such corrective actions to said private storm water drainage systems as are necessary to maintain properly the drainage systems within the CITY; and

WHEREAS, under said Management Plan it is provided that private storm water drainage systems must be maintained by the property owner, and a maintenance agreement must be executed before the development plan is approved, or in the case of developed properties has already been approved; and

WHEREAS, the Landowner is the owner of certain real property, more particularly described as

### **LEGAL DESCRIPTION**

Project/Development Name - \_\_\_\_\_

(hereinafter called the “Property”); and

WHEREAS, the Landowner is proceeding to build on and develop the property (or the property has previously been developed); and

WHEREAS, the Management Plan provides for the construction of storm water drainage systems on the property and such are detailed in the Site Plan/Subdivision Plan (Site Plan); and

WHEREAS, the City and the Landowner agree that the health, safety, and general welfare of the residents of Pleasant Grove City require that storm water drainage systems be constructed and maintained on the property; and

WHEREAS, the City requires that storm water drainage systems as shown on the Site Plan be constructed and adequately maintained by the Landowner;

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The storm water drainage systems shown in the Site Plan shall be constructed by the Landowner in accordance with the plans and specifications in the Management Plan.
2. The Landowner shall maintain the storm water drainage systems as shown on the Site Plan in good working order acceptable to the City.
3. The Landowner shall annually certify that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality. Such certification shall be on a form provided by the City and occur with renewal of business license or, if there is no business license required, at an agreed upon date each year.
4. In the event that Federal or State regulations governing the City’s Management Plan change such that modifications are needed to the Site Plan, the Landowner shall make such updates within four months of notification by the City.
5. The landowner hereby grants permission to the City, its authorized agents, and employees to enter the property and to inspect any storm water structures wherever it deems necessary.
6. In the event the Landowner fails to maintain storm water drainage systems as shown on the Site Plan in good working order acceptable to the City, the City may enter the property and take whatever steps it may deem necessary to maintain said storm water drainage systems. It is expressly understood and agreed that City is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the City.
7. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, or materials, the Landowner shall reimburse the City on demand, within a time frame specified by the City for all

costs incurred, including reasonable attorney's fees in the event that an action to collect such costs must be instituted.

8. It is the intent of this Agreement to insure the proper maintenance of storm water drainage systems and structures by the Landowner; provided, however, that this Agreement shall not be deemed to create or affect any additional liability of any party for damage alleged to result from or be caused by storm water management.
9. The Landowner, its executors, administrators, assigns, and any other successors in interest, shall indemnify and hold the City and its agents and its employees harmless for any and all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against the City from the construction, presence, existence, or maintenance of the storm water drainage systems by the Landowner or the City.
10. In the event a claim is asserted against the City, its agents, or employees, the City shall notify the Landowner and the Landowner shall defend at his own expense any suit based on such claim. If any judgment or claims against the City, its agents, or its employees shall be allowed, the Landowner shall pay all costs and expenses in connection therewith.
11. This Agreement shall be recorded among the land records of Utah County, Utah, and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, leasees, executors, assigns, heirs, and any other successors in interest.

WHEREUPON, the parties hereto have set their hands the day and year first above written.

**LANDOWNER**

\_\_\_\_\_

By (Print Name):

\_\_\_\_\_

Signature:

\_\_\_\_\_

Title:

\_\_\_\_\_

Property Ownership Entity:

(Signature must be notarized, as applicable, on page four or five of this document.)

Date Signed: \_\_\_\_/\_\_\_\_/\_\_\_\_

**PLEASANT GROVE CITY**

**AUTHORIZED CITY OFFICIAL**

---

(Print Name)

---

Signature

\_\_\_\_/\_\_\_\_/\_\_\_\_

Date Signed

---

Title

Authorized City Officials

- City Engineer
- Public Works Director
- City Administrator

---

APPLICANT NOTARY (Use Appropriate Acknowledgment)

---

(Complete only if APPLICANT is an Individual)

STATE OF \_\_\_\_\_)

COUNTY OF \_\_\_\_\_) ss.

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, personally appeared before me,

\_\_\_\_\_, the signer(s) of the foregoing instrument,  
who duly acknowledged to me that s/he executed the same.

NOTARY PUBLIC

\_\_\_\_\_

(Print Name)

\_\_\_\_\_

\_\_\_\_/\_\_\_\_/\_\_\_\_

Signature

My Commission Expires

Residing in \_\_\_\_\_ County, State of \_\_\_\_\_

---

(Complete only if APPLICANT is a Partnership)

STATE OF \_\_\_\_\_)

COUNTY OF \_\_\_\_\_) ss.

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, personally appeared before me,

\_\_\_\_\_, who being by me duly sworn did say that  
s/he is the \_\_\_\_\_ of

\_\_\_\_\_, a partnership,  
and that the foregoing instrument was signed in behalf of said partnership after a lawful meeting  
held or by authority of its by-laws and signed in behalf of said partnership.

NOTARY PUBLIC

\_\_\_\_\_

(Print Name)

\_\_\_\_\_

\_\_\_\_/\_\_\_\_/\_\_\_\_

Signature

My Commission Expires

Residing in \_\_\_\_\_ County, State of \_\_\_\_\_

(Complete only if APPLICANT is a Corporation)

STATE OF \_\_\_\_\_)

COUNTY OF \_\_\_\_\_) ss.

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, personally appeared before me,

\_\_\_\_\_, who being by me duly sworn did say that  
s/he/ is the \_\_\_\_\_ of,

\_\_\_\_\_, a Corporation,  
and that the foregoing instrument was signed in behalf of said Corporation by authority of its  
Board of Directors, and s/he acknowledged to me that said Corporation executed the same.

NOTARY PUBLIC

\_\_\_\_\_

(Print Name)

\_\_\_\_\_

\_\_\_\_/\_\_\_\_/\_\_\_\_

Signature

My Commission Expires

Residing in \_\_\_\_\_ County, State of \_\_\_\_\_



# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

---

### APPENDIX H – PREFERRED DESIGN SPECIFICATIONS

#### CONTENTS

APPENDIX H – Preferred Design Specifications .....	1
Retail Gasoline Outlets (BMP PD-1) .....	2
Auto Repair Shops (BMP PD-2) .....	5
Kennels (BMP PD-3) .....	9
Auto Dealers (BMP PD-4) .....	11
Equipment Rentals (BMP PD-5) .....	15
Restaurants (BMP PD-6) .....	18
Auto Body Shops (BMP PD-7) .....	21
Dry Cleaning (BMP PD-8) .....	25
Nurseries (BMP PD-9) .....	28
Concrete Applications (BMP PD-10) .....	31
Heavy Equipment & Earth Moving Activities (BMP PD-11) .....	32
Roadwork and Paving (BMP PD-12) .....	33

## ***Retail Gasoline Outlets (BMP PD-1)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that provide vehicle fueling services.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Fueling
2. Air/water supplying areas
3. Dumpster and trash can areas

Pollutants may include:

1. Heavy metals (copper, lead, nickel, and zinc)
2. Hydrocarbons (oil and grease, PAHs)
3. Toxic chemicals (benzene, toluene, xylene)
4. Trash

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products.
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets.
- c. Reduce the use of water and/or use dry methods (e.g. sweeping).
- d. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning outdoor areas, contain the wash water and dispose of in the sanitary sewer (with permission of the local sewer provider) or for offsite disposal, do not dispose of in the gutter or street.
- Maintain facility and move/cover activities/materials to prevent contact with storm water.
- Inspect and clean leaks and drips routinely.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.
- Inspect/clean, storm drain inlets within the facility boundary before October 1 each year.

## **FUELING**

- Maintain fuel dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills.
- Fueling areas should never be washed down unless the wash water is collected and disposed of properly. Do not discharge waste to the sanitary sewer until contacting the local sewer authority to determine if pretreatment is required.
- Fit fuel dispensing nozzles with “hold-open latches” (automatic shutoffs) except where prohibited by local fire departments.
- Cover the fuel dispensing area such that the cover’s minimum dimensions are equal to or greater than the area within the grade break or fuel dispensing area. Position roof downspouts to direct water away from fueling areas.
- Construct a berm around the perimeter of the fuel dispensing area to prevent the run-on of uncontaminated storm water from adjacent areas as well as storm water runoff.
- Slope the pavement near the fuel dispensing areas to prevent ponding.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against “topping off” of vehicle fuel tanks.
- Install protective guards around tanks and piping to prevent vehicle damage and spills.

## **DUMPSTER AND TRASH CAN AREAS**

- Minimize the possibility of storm water pollution from outside waste receptacles by doing the following:
  - Use only water-tight waste receptacle(s) and keep the lid(s) closed;
  - Grade and pave the waste receptacle area to prevent run-on of storm water;
  - Install a roof over the waste receptacle area;
  - Install a low containment berm around the waste receptacle area; and
  - Empty waste receptacles frequently.

## **SPILL CLEANUP**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily available.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility’s spill control plan and proper spill containment and cleanup procedures.

4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Auto Repair Shops (BMP PD-2)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that conduct auto repair and maintenance activities.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Automobile servicing
2. Parts cleaning
3. Materials and waste handling
4. Materials storage
5. Cleaning floors

Pollutants may include:

1. Fueling
2. Heavy metals (copper, lead, nickel, and zinc)
3. Hydrocarbons (oil and grease, PAHs)
4. Toxic chemicals (solvents, chlorinated compounds, glycols)
5. Acids and alkalis

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Minimize use of solvents – use water-based solvents for cleaning, if possible;
- e. Recycle and reuse waste products and waste flows; and
- f. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning shop floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer (with permission of sewer provider) or for offsite disposal, do not dispose of in the storm drain, gutter, or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.

- Use a vehicle maintenance area designed to prevent storm water pollution – minimize contact of storm water with outside operations through berming and appropriate drainage routing.
- Inspect and clean leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Manage materials and waste to reduce adverse impacts on stormwater quality.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.
- Inspect and clean if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.
- Sweep parking lots and areas around your facility instead of washing them down with water.
- Send dirty rags to an industrial laundry.

## **AUTOMOBILE SERVICING**

- Only conduct maintenance or repair work in designated areas with spill containment.
  - Construct a berm or intercept trench at doorways to prevent the run-on of uncontaminated storm water from adjacent areas as well as stormwater runoff.
  - Avoid working over asphalt and dirt floors – surfaces that absorb vehicle fluids.
- Perform all vehicle fluid removal or changing inside or under cover, if possible, to prevent the run-on of storm water and the runoff of spills.
- Keep a drip pan under the vehicle while unclipping hoses, unscrewing filters, or removing other parts. Use a drip pan under any vehicle that might leak.
- Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being conducted outside. Collected drips and spills must be disposed, reused, or recycled properly.
- Keep equipment clean – do not allow excessive build-up of oil and grease.
- Monitor parked vehicles for leaks. Pans should be placed under any leaks to collect the fluids for proper disposal or recycling. Drain oil and other fluids first if the vehicle or equipment is to be stored outdoors. Do not allow leaking vehicles on-site.
- Avoid soldering over drip tanks. Sweep up drippings and recycle or dispose of as hazardous waste.
- Sweep or use a vacuum to clean up dust and debris from scraping or bead blasting radiators.

## **PARTS CLEANING**

- Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- Steam cleaning and pressure washing may be used instead of solvent parts cleaning. The wastewater generated from steam cleaning must be discharged to an on-site oil/water separator that is connected to a sanitary sewer or blind sump. Never discharge wastewater from steam cleaning, or engine/parts cleaning to a street, gutter, or storm drain.

- Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning.
- Designate specific areas or service bays for engine, parts, or radiator cleaning. Do not wash or rinse parts outdoors. Keep water from flowing to storm drains, gutters, and streets.
- Use self-contained sinks and tanks when working with solvents. Keep sinks and tanks covered when not in use.
- Rinse and drain parts over the solvent sink or tank. Use drip boards or pans to catch excess solutions and divert them back to a sink or tank.
- Inspect degreasing solvent sinks regularly for leaks and make necessary repairs immediately.
- Allow parts to dry over the hot tank. If rinsing is required, rinse over the tank as well.
- Collect and reuse parts cleaning solvents and water used in flushing and testing radiators. When reuse is no longer possible, these solutions may be hazardous wastes, and must be disposed properly.
- Rinse water may only be discharged to the sanitary sewer with adequate treatment and approval (with permission of sewer provider).

## **MATERIALS AND WASTE HANDLING**

- Label all hazardous wastes according to hazardous waste regulations.
- Keep lids on waste barrels and containers and store them indoors or under cover to reduce exposure to rain and prevent spills from reaching the sanitary sewer or storm drain, gutter, and street.
- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not leave drip pans or other open containers lying around.
- Recycle oil.
- Store cracked batteries in a non-leaking secondary container and dispose of properly at recycling or household hazardous waste facilities.
- Store waste containers of antifreeze and oil within secondary containment. Antifreeze and waste oil should be stored separately and recycled, or disposed of as hazardous waste.
- Ask your supplier for information on less toxic chemical cleaners and other products.
- Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).

## **MATERIALS STORAGE**

- Double-contain all bulk fluids to prevent accidental discharges.
- Store new batteries securely to avoid breakage and acid spills. Store used batteries indoors and in plastic trays to contain potential leaks.

## **CLEANING FLOORS**

- Collect all metal filings, dust, and paint chips from grinding, shaving, and sanding, and dispose of waste properly. Collect all dust from brake pads separately and dispose of the waste properly. Never sweep these wastes outside.
- Use dry cleaning methods (i.e. sweeping, vacuuming) to prevent the discharge of pollutants into the storm drain conveyance system.
- If cleaning agents are used, select biodegradable products.
- If water is used, block off storm drain or contain runoff and collect wash water to pump to the sanitary sewer, if allowed. If wash water contains soaps or other cleaning agents and can not be pumped to the sanitary sewer, it may need to be disposed of as hazardous waste.
- Consider using an oleophilic mop (picks up oil and not water) to reduce the volume of waste liquids you collect and reduce your cost for disposal.

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Minimize the distance between waste collection points and storage areas.
- Contain and cover all solid and liquid wastes – especially during transfer.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.



## ***Kennels (BMP PD-3)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that conduct kennel and other types of domestic animal housing and maintenance practices.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Animal cleaning
2. Animal housing

Pollutants may include:

1. Bacteria
2. Nutrients
3. Soaps, detergents
4. Pesticides

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and.
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for outdoor kennel areas, contain the wash water and dispose of in the sanitary sewer. Do not dispose of in the gutter or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Stencil on-site storm drains.

#### **ANIMAL CLEANING**

- When washing animals, wash in a designated area that drains to the sanitary sewer.

## **ANIMAL HOUSING**

- If feasible, house the animals in paved and covered areas.
- If housing the animals in covered areas is not feasible, cover the ground with vegetation or some other type of ground cover such as mulch.
- Clean the animal handling areas frequently.
- Use dry cleaning methods to clean animal handling areas.
  - Sweeping animal handling areas is encouraged.
  - Properly dispose of droppings, uneaten food and other potential contaminants. Do not wash out to storm drains, gutters, or streets when cleaning the area.
- If water is used for cleaning the housing areas:
  - Do not discharge wash water to storm water drains or other receiving waters.
  - Block the storm drain and contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer and should not enter storm drains.

## **SPILL CONTROL**

- Place an adequate stockpile of spill cleanup materials where it will be readily available.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Auto Dealers (BMP PD-4)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that buy, trade and sell automobiles.

### Potential Pollutant Sources

The following activities are potential sources of pollutants:

1. Minor automobile servicing
2. Cleaning Floors
3. Washing cars
4. Parking lot cleaning

Pollutants may include:

1. Heavy metals (copper, lead, nickel, and zinc)
2. Hydrocarbons (oil and grease, PAHs)
3. Toxic chemicals (solvents, chlorinated compounds, glycols)
4. Acids and alkalis

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning shop floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer (if allowed by the local sewer authority) or for offsite disposal, do not dispose of in the gutter or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Inspect and clean leaks and drips routinely.
- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.

## **MINOR AUTOMOBILE SERVICING**

### *Maintenance and Repair Work*

- Only conduct maintenance or repair work in designated areas with spill containment.
  - Construct a berm or intercept trench at doorways to prevent the run-on of uncontaminated stormwater from adjacent areas as well as stormwater runoff.
  - Avoid working over asphalt and dirt floors which can absorb vehicle fluids.
- Perform all vehicle fluid removal or changing inside or under cover if possible to prevent the run-on of storm water and the runoff of spills:
  - Keep a drip pan under the vehicle while unclipping hoses, unscrew filters, or removing other parts. Use a drip pan under any vehicle that might leak.
  - Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
  - Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips if temporary work is being conducted outside. Collected drips and spills must be disposed, reused, or recycled properly.

## **CLEANING FLOORS**

- Use dry cleaning methods (i.e. sweeping, vacuuming) to prevent the discharge of pollutants to the storm drain conveyance system.
- If cleaning agents are used, select biodegradable products.
- If water is used, block off storm drain or contain runoff and collect wash water to pump into the sanitary sewer, if allowed. If wash water contains soaps or other cleaning agents and can not be pumped to the sanitary sewer, it may need to be disposed of as hazardous waste.

## **WASHING CARS**

- Use off-site commercial washing businesses, if feasible.
- Designate an impervious indoor or outdoor area to be used solely for vehicle washing. Clearly mark the vehicle washing area.
- Design wash area to collect and properly dispose of wash water and/or effluent generated.
  - Install sumps or drain lines to collect wash water.
  - Construct a berm around the area to collect wash water and prevent storm water run-on.
  - Use portable containment and vacuum collect the wash water.
- If the wash area is outdoors, cover the area when not in use.
  - Collect all wash water from vehicle cleaning operations and discharge to a sanitary sewer (if allowed by the local sewer authority ), holding tank, or process treatment system through an enclosed recycling system.
  - Do not discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required.

- Install a water recirculation/reclamation system, if feasible.
- Use biodegradable, phosphate-free detergents. Remember, even though these detergents are better, the wash water still needs to be discharged to the sanitary sewer.
- Provide trash containers in wash area and empty on a regular basis. Use recycle bins.
- Use hoses with nozzles that automatically turn off when left unattended.
- Do not degrease the engine in the wash area. Take the vehicle to an off-site facility that can process the wastewater.

## **PARKING LOT CLEANING**

- Inspect the storage yard for filling drip pans and other programs (leaking equipment) regularly.
- Provide an adequate number of litter receptacles. Clean out and cover litter receptacles frequently to prevent spillage.
- Clean oil/water/sand separators regularly, especially after heavy storms.
- Establish a parking lot sweeping frequency based on usage and waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Inspect and clean if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.
- Use dry cleaning methods (i.e. sweeping, vacuuming) to prevent the discharge of pollutants into the storm drain conveyance system.
- If water or cleaning agents are used for cleaning (even biodegradable cleaners) :
  - Block the storm drain or contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains, gutters, or streets. If wash water does not contain soap or other cleaning agents, discharge to a pervious surface.
  - Dispose parking lot sweeping debris and dirt in the trash.
- When cleaning heavy oily deposits:
  - Use absorbent materials on oily spots prior to sweeping or washing.
  - Dispose used absorbents appropriately.
  - Vacuum/pump discharges to a tank or discharge to a sanitary sewer (with permission).

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Equipment Rentals (BMP PD-5)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that clean, store, and rent equipment.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Equipment servicing
2. Washing equipment
3. Handling/storing materials
4. Storing equipment
5. Equipment fueling

Pollutants may include:

1. Heavy metals (copper, lead, nickel, and zinc)
2. Hydrocarbons (oil and grease, PAHs)
3. Toxic chemicals (solvents, chlorinated compounds, glycols)
4. Acids and alkalis

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, or streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning shop floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer (with permission of sewer provider) or for offsite disposal. Do not dispose of in the gutter or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Inspect and clean leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.

## **EQUIPMENT SERVICING**

- Perform major equipment repairs in a specified area or corporation yard.
- Move maintenance and repair activities indoors, if possible. If this is not possible, cover repair area with a permanent roof. Place curbs or berms around the immediate boundaries of the process equipment.
- Regularly inspect equipment for leaks. Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle or dispose of if kept separate.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Do not hose down work areas. If work areas are washed with water, discharge wash water to the sanitary sewer with permission. If discharge to the sanitary sewer is not permitted, collect wash water and dispose of properly.
- Keep equipment clean – do not allow excessive build-up of oil or grease.

## **WASHING EQUIPMENT**

- Use off-site commercial washing businesses, if feasible.
- If washing must occur on-site, designate an impervious area to be used solely for equipment washing. Clearly mark the equipment washing area.
- Design wash area to collect and properly dispose of wash water.
- Recycle or reuse liquid cleaners, if feasible. Use non-toxic cleaners.
- If the wash area is outdoors, cover the area when not in use.
- Provide trash containers in wash area and empty on a regular basis. Use recycle bins.
- Discharge wash water to sanitary sewer.

## **HANDLING/STORING MATERIALS**

- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.
- Store batteries in a secondary container.

## **STORING EQUIPMENT**

- Place drip pans or absorbent materials under equipment.
- Sweep/vacuum all storage area at least once before the onset of the wet season.
- Use dry cleaning methods to prevent the discharge of pollutants into the storm water conveyance system.
- Dispose of storage area sweeping debris and dirt properly.



- If water is used, block off storm drain or contain runoff and collect wash water to pump to the sanitary sewer.
- If cleaning agents are used, select biodegradable products.
- Clean heavy oily spots with absorbent materials. Seal the storm drain.
- Appropriately dispose of spilled materials and absorbents.
- Provide an adequate number of litter receptacles. Clean out and cover litter receptacles frequently to prevent spillage.

## **EQUIPMENT FUELING**

- Maintain fuel dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills. Fueling areas should never be washed down unless the wash water is collected and disposed of properly.
- Clean leaks and drips immediately. Leaks are not cleaned up until the absorbent is picked up and disposed properly.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Use secondary containment such as curbs or berms when transferring fuel from the tank truck to the fuel tank.

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily available.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Restaurants (BMP PD-6)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that prepare and serve food.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Dumpster and loading dock area maintenance
2. Equipment cleaning
3. Grease handling and disposal
4. Landscaping and grounds maintenance

Pollutants may include:

1. Bacteria
2. Organic materials (food wastes)
3. Trash
4. Oil and grease
5. Toxic chemicals (cleaning products, disinfectants)

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning facility floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer. Do not dispose of in the gutter, storm drain, or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Stencil on-site storm drains.

## **DUMPSTER AND LOADING DOCK AREAS MAINTENANCE**

- Provide trash and recycling receptacles to keep litter from accumulating around loading docks.
- Bag and seal food waste before putting it in the dumpster. Do not place uncontained liquids, or leaking containers or garbage bags into a dumpster.
- Keep dumpster lids closed to keep out rainwater and to prevent trash from spilling out. Consider enclosing the dumpster in a roofed and contained area.
- If the dumpster regularly overflows, get a bigger one or arrange for more frequent collection.
- If dumpster is hosed out for cleaning, direct the wash water to landscaping or the sanitary sewer once the floatable trash and debris are removed.
- Have the dumpster leasing company repair or replace leaky dumpsters and compactors, and have them clean out dirty dumpsters.
- Keep dumpsters or the dumpster enclosure locked to prevent illegal dumping.

## **EQUIPMENT CLEANING**

- Clean floor mats, filters, and garbage cans in a mop sink, floor drain, or proper outside area connected to the sanitary sewer with an oil and water separator. Pour all wash water into the mop sink. Do not wash them in a parking lot, alley, sidewalk, or street.

## **GREASE HANDLING AND DISPOSAL**

- Recycle grease and oil. Do not contaminate the recyclable oils and grease in the tallow bin with the waste grease from the grease trap or grease interceptor.
- Keep grease that is stored outside under a roof, if feasible.
- Clean grease trap regularly.
- For disposal of waste grease from the grease trap or grease interceptor, see “Grease Traps” or “Septic Tanks” in the phone book.

## **MATERIALS PURCHASING, RECYCLING, AND DISPOSAL**

- Dispose of toxic waste properly. Toxic wastes include used cleaners and rags (soaked with solvents, floor cleaners, and detergents).

## **LANDSCAPING AND GROUNDS MAINTENANCE**

- Leftover pesticides must either be used up or disposed of as hazardous waste. Do not dispose leftover pesticides in the gutter, street, or storm drain.
- If pesticides are used, do not over-apply or apply when rain is forecasted.
- Do not blow or rake leaves, grass, or garden clippings into the street, gutter, or storm drain.

## **SPILL CLEANUP**

- Place an adequate stockpile of spill cleanup materials where it will be readily available.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

### **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Auto Body Shops (BMP PD-7)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that conduct auto body repair, painting, detailing and washing.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Wet and dry sanding
2. Painting
3. Washing cars and other vehicles
4. Cleaning floors

Pollutants may include:

1. Heavy metals (copper, lead, nickel, and zinc)
2. Hydrocarbons (oil and grease, PAHs)
3. Toxic chemicals (solvents, chlorinated compounds)

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning shop floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer (with permission of the sewer agency) or for offsite disposal, do not dispose of in the gutter or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- When receiving damaged vehicles, inspect for leaks. Use drip pans, if necessary.
- Conduct all body repair and painting work indoors.
- Inspect and clean leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.

## **WET AND DRY SANDING**

- Conduct all sanding indoors.
- Use dent repair tools, whenever practical for small dents.

### *Dry Sanding*

- Perform sanding activities in a contained area.
- Use vacuum sanding equipment, whenever possible, to reduce the amount of airborne dust.
- Use dry cleanup methods (sweep or vacuum) to pick up dust from dry sanding of primer, metal, or body filler.

### *Wet Sanding*

- Do not use wet sanding in a wash rack or in areas with a floor drains.
- Use a spray bottle to squirt water onto the panel that is being sanded. This eliminates sanding bucket wastewater and minimizes drips and spills.
- Place a pan under the car panel being wet sanded to catch drips. Pour the collected water back into the wet sanding bucket.
- Clean up drips with a rag, or let the drips dry and then sweep or vacuum up the dust.
- Dispose of wet sanding waste in one of the following ways:
  - Settle the waste and then separate the water from the sludge;
  - Discharge the water to a Permitted Treatment System; or
  - Dispose of the water at an offsite disposal facility.

## **PAINTING ACTIVITIES**

### *Cleaning Auto Body Parts*

- When cleaning auto body parts before painting, first brush off the dirt and use rags to wipe down the parts.
- If degreasers are used to clean the parts, conduct degreasing in a designated area and contain the wastewater for proper disposal. Do not let the wastewater run into the gutter or street.
- Avoid using acid-based wheel cleaners if soap and elbow grease will work.
- If an acid-based metal cleaner or cleaner/conditioner is used to treat bare metal and rinse water is recommended to stop the chemical reaction, use as little water as possible and wipe down the area with a rag or towel. Wastewater should be contained and disposed of properly.

## *Painting*

- Conduct all painting indoors, preferably in a paint booth.
- Do not use water to control overspray or dust in the paint booth unless it will evaporate in the booth (so the dust can be swept up), or the wastewater is collected. The water should be treated prior to discharge into the sewer system.
- Use drop/ground cloths underneath outdoor painting, scraping, and sandblasting work as well as any outdoor mixing of paints, solvents, and tool cleaning.
- Shelter any blasting and spray painting activities.
  - Hang wind-blocking tarps to prevent sand blasting dust and overspray from escaping.
  - Do not conduct these activities when wind conditions render containment ineffective.
  - Do not conduct these activities over open water.
- Cover and seal nearby storm drain inlets
  - Cover and seal nearby storm drain inlets with waterproof material, mesh, or other runoff control device.
  - Leave covers in place until job is complete.
  - Clean covers daily and remove any debris for proper disposal.

## *Paint Waste*

- Never discharge gun-cleaning solution to the sewer or storm drain.
- Properly clean, store, and dispose of painting, finishing, and coating materials.
  - Do not dispose of liquid wastes on the pavement or ground
  - Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain.
  - Clean paint brushes and tools covered with non-water-based paints, finishes, or other materials such that used solvents (e.g. paint thinner, turpentine, etc.) can be collected for recycling or proper disposal.
  - Recycle paint, paint thinner, solvents, and other recyclable materials.

## **WASHING CARS**

Designate an impervious indoor or outdoor area to be used solely for vehicle washing. Clearly mark the vehicle washing area.

- Use off-site commercial washing businesses, if feasible.
- Design wash area to collect and properly dispose of wash water and/or effluent generated.
  - Install sumps or drain lines to collect wash water.
  - Construct a berm around the area to collect wash water.
  - Use portable containment and vacuum collect the wash water.
- If the wash area is outdoors, cover the area when not in use.
  - Collect all wash water from vehicle cleaning operations and discharge to a sanitary sewer (if allowed by the local sewer authority), holding tank, or process treatment system through an enclosed recycling system.

- Do not discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required.
- Use biodegradable, phosphate-free detergents. Remember, even though these detergents are better, the wash water still needs to be discharged to the sanitary sewer.
- Provide trash containers in wash area and empty on a regular basis.
- Use hoses with nozzles that automatically turn off when left unattended.
- Do not degrease the engine in the wash area. Take the vehicle to an off-site facility that can process the wastewater.

## **CLEANING FLOORS**

- Use dry cleaning methods (i.e. sweeping, vacuuming) to prevent the discharge of pollutants to the storm drain conveyance system.
- If cleaning agents are used, select biodegradable products.
- If water is used, block off storm drain or contain runoff and collect wash water to pump into the sanitary sewer, if allowed. If wash water contains soaps or other cleaning agents and can not be pumped to the sanitary sewer, it may need to be disposed of as hazardous waste.

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.



## ***Dry Cleaning (BMP PD-8)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that conduct cleaning of apparel, textile industrial goods and other fabric items. The dry cleaning industry includes commercial, industrial, and coin-operated facilities.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Chemical Storage
2. Chemical Use
3. Equipment Maintenance and Repair
4. Cooling water

Pollutants may include:

1. Toxic chemicals (solvents, chlorinated compounds, glycols)
2. Hydrocarbons (oil and grease, PAHs)

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and
- e. Provide on-going employee training.

### **Best Management Practices and Procedures**

#### **GENERAL**

- If water is being used for cleaning shop floors and adjacent outdoor areas, contain the wash water and dispose of in the sanitary sewer (with permission of sewer provider) or for offsite disposal, do not dispose of in the gutter or street.
- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Dispose of chemical recovery filters appropriately.
- Stencil on-site storm drains.

#### **CHEMICAL STORAGE**

- Clearly label all chemicals containers.
- Store chemicals indoors, if possible. If chemicals must be stored outside, construct a covered and bermed area to protect the containers from contact with storm water and to contain spills.
- Do not leave chemical containers uncovered. Use air-tight containers for chemical storage.

## **CHEMICAL USE**

- Use only as much chemicals as needed for cleaning. Reuse or recycle chemicals, if possible.
- Collect wash water and dispose of properly. Do not discharge wash water into storm drains, gutters, or streets.
- Use a licensed service to dispose of hazardous waste. Hazardous wastes can include used rags soaked with solvents, floor cleaners and detergents.

## **EQUIPMENT MAINTENANCE AND REPAIR**

- Move maintenance and repair activities indoors, if possible. If it is not possible, cover the repair area with a roof and cover the ground with a tarp, ground cloth, or drip pans.
- Regularly inspect equipment for leaks. Collect leaking or dripping fluids in drip pans or containers.
- Use biodegradable, phosphate-free detergents for cleaning machines rather than solvents. Contain wash water and dispose of in the sanitary sewer (with permission of sewer provider).

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Remove the absorbent materials promptly and dispose of properly.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

## **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.

4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Nurseries (BMP PD-9)***

This Fact Sheet provides Best Management Practices (BMPs) that are recommended for facilities that grow and sell plants and conduct other landscaping activities.

### **Potential Pollutant Sources**

The following activities are potential sources of pollutants:

1. Irrigation
2. Garden waste disposal
3. Chemical usage

Pollutants may include:

1. Nutrients (fertilizers, plant wastes)
2. Pesticides
3. Heavy metals (copper, lead, and zinc)
4. Sediments

### **Pollution Prevention**

Implementation of pollution prevention measures may reduce or eliminate the need to implement other more costly or complicated procedures.

The following pollution prevention principles apply to most facilities:

- a. Use alternative, safer, non-toxic, and/or recycled products;
- b. Reduce storm water flow across the site and redirect flows away from storm drains, gutters, and streets;
- c. Reduce the use of water and/or use dry methods;
- d. Recycle and reuse waste products and waste flows; and

## **Best Management Practices and Procedures**

### **GENERAL**

- Maintain facility grounds and move or cover activities and materials to prevent contact with storm water.
- Promote native plants when possible to help conserve water, filter impurities, reduce the need for toxic pesticides, fertilizers, and herbicides.
- Stencil on-site storm drains.

### **IRRIGATION**

- Use intermittent (pulse) or drip irrigation to conserve water and prevent discharges.
- Regularly inspect irrigation systems for leaks to prevent excessive runoff from occurring.

- Convert paved or bare soil areas to vegetation that will slow runoff (turf grasses or other comparable plant materials), if feasible.
- Group plants with similar water needs together to improve irrigation efficiency.
- During warm summer months, irrigate only after 6 PM and before 11 AM to reduce evaporation.

## **GARDEN WASTE DISPOSAL**

- Do not dispose of garden wastes in streets, waterways, or storm drains.

## **CHEMICAL USAGE**

### *Storage and Disposal*

- Implement storage requirements for pesticide, herbicide, and fertilizer products with guidance from the local fire department and/or County Agricultural Commissioner.
- Provide secondary containment for chemical storage.
- Dispose of empty containers according to the instructions on the container label.

### *Pesticide Usage*

- Follow manufacturers' recommendations and label directions.
- Use the minimum amount of chemicals needed for the job.
- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule). Avoid the use of copper-based pesticides, if possible.
- Do not apply pesticides if rain is expected or if wind speeds are above 5 mph.
- Do not mix or prepare pesticides within 100 feet of any well, stream, or pond.
- Do not dispose of unused pesticides by washing them down the drains. Dispose of unused pesticides as hazardous waste.
- Employ techniques to minimize off-target applications (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Careful soil mixing and layering techniques using a topsoil mix or composted organic material can be used as an effective measure to reduce herbicide use and watering.

### *Fertilizer Usage*

- Periodically test soils to determine proper fertilizer use.
- If feasible, spread out applications of controlled-release fertilizers and use split applications of soluble fertilizers over the growing season.
- Work fertilizers into the soil rather than dumping or broadcasting them.
- Transition from the use of soluble fertilizers to controlled-release fertilizers. Use slow release fertilizers whenever possible to minimize leaching. Reduce or eliminate routine leaching of crops.

## **SPILL CONTROL**

- Develop and maintain a spill response plan.
- Place an adequate stockpile of spill cleanup materials where it will be readily available.
- Spot clean leaks and drips routinely.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Sweep pavement and sidewalk if chemicals are spilled on these surfaces before applying irrigation water.
- Keep the spill from entering the street, gutter, or storm drain.
- Do not use bleach or disinfectants if there is a possibility that rinse water could flow to a street, gutter, or storm drain.

### **Employee Training**

1. Train employees on these practices.
2. Train staff on the proper maintenance of the facility.
3. Train employees on the facility's spill control plan and proper spill containment and cleanup procedures.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

## ***Concrete Applications (BMP PD-10)***

### **Getting Started**

- Schedule projects for dry weather seasons/periods.
- Keep materials out of the rain. Store both dry and wet materials under cover, protected from rainfall and runoff. Also protect dry materials from the wind.
- Secure open bags of cement to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall and runoff.
- Minimize waste when ordering materials. Order only the amounts needed to complete the job.

### **During Construction**

- Place erosion controls down slope to capture runoff carrying mortar or cement before it reaches the storm drain.
- Do not mix up more fresh concrete or cement than will be used.
- Set up and operate small mixers on tarps or heavy drop cloths.
- When breaking up paving (cement or asphalt) be sure to pick up all the pieces. Recycle them at a crushing company.
- Dispose of small amounts of excess dry concrete, grout and mortar in the trash.
- Use recycled and recyclable materials whenever possible.

### **Cleaning Up**

- When cleaning up after driveway or sidewalk construction, wash concrete dust onto dirt areas, not down the driveway or into the street or storm drain.
- Wash out concrete mixers and equipment only in designated wash-out areas, where the water flows into containment ponds or onto dirt.
- Recycle cement wash water by pumping it back into cement mixers for reuse.
- Never dispose of cement washout into driveways, streets, gutters, storm drains or drainage ditches.
- Recycle broken asphalt, concrete, wood and cleared vegetation.

## ***Heavy Equipment & Earth Moving Activities (BMP PD-11)***

### **Vehicle and Equipment Maintenance**

- Maintain all vehicles and heavy equipment. Inspect frequently for leaks.
- Conduct all vehicle/equipment maintenance and refueling at one location away from storm drains.
- Perform major maintenance, repair jobs and vehicle/equipment washing off site.
- Use gravel approaches where truck traffic is frequent to reduce soil compaction and limit the tracking of sediment into streets.
- Use drip pans or drop cloths to catch drips and spills. Treat collected material as hazardous waste.
- Do not use diesel oil to lubricate equipment or parts.

### **Cleaning Up**

- Sweep up dry spilled materials immediately. Never attempt to bury them or wash them into a storm drain.
- Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- To report a significant spill, dial **911**. For general information on spills, contact the Utah County Health Department at **(801) 851-7000**.
- Clean up leaks, drips, and other spills immediately by using an absorbent material such as kitty litter or sawdust. Treat collected material as hazardous waste.
- Never hose down pavement or surfaces where materials have been spilled.

### **Pollution Prevention**

- After clearing, grading or excavating, exposed soil poses a clear and immediate danger of stormwater pollution. One solution is re-vegetation (permanent or temporary), which is an excellent form of erosion control for any site.
- Avoid excavation and grading activities during wet weather.
- Construct diversion dikes to channel runoff around the site. Line channels with grass or roughened pavement to reduce runoff velocity.
- Cover stockpiles and excavated soil with secured tarps or plastic sheeting.
- Remove existing vegetation only when absolutely necessary. Large projects should be conducted in phases.



## ***Roadwork and Paving (BMP PD-12)***

### **During Construction**

- Avoid paving and seal coating in wet weather, or when rain is forecast before fresh pavement will have time to cure.
- Cover and seal catch basins and maintenance holes when applying seal coat, slurry seal, fog seal, etc.
- Never wash excess material from exposed aggregate concrete or similar treatments into a street or stormwater drain. Collect and recycle, or dispose into dirt area.
- Use check dams or ditches to divert runoff around excavations.
- Cover stockpiles and excavated soil with secured tarps or plastic sheeting.
- Catch drips from paver with drip pans or absorbent materials placed under the machine when not in use. Treat collected material as hazardous material.
- Clean up all spills and leaks using "dry" methods like sweeping or absorbing, or dig up and remove contaminated soil.
- Collect and recycle or appropriately dispose of excess abrasive gravel or sand.
- Avoid over application by water trucks for dust control.

### **General Business Practices**

- Schedule excavation and grading work for dry weather.
- Perform major equipment repairs away from the job site.
- Shovel or vacuum saw cut slurry and remove from site.
- When refueling or maintenance must be done on site, designate a location away from storm drains.
- Do not use diesel oil to lubricate equipment or parts.
- Recycle used oil, concrete, broken asphalt, etc., whenever possible.
- Check for and repair leaking equipment.

### **Asphalt/Concrete Removal**

- Avoid creating excess dust when breaking asphalt or concrete.
- After breaking old pavement, be sure to remove all chunks and pieces.
- Make sure broken pavement does not come in contact with rainfall or runoff.
- Never hose down streets to clean up tracked dirt.
- Cover storm drains during saw cutting if necessary.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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APPENDIX I – SAMPLE SPILL RESPONSE PLAN

# STORMWATER POLLUTION PREVENTION & SPILL RESPONSE PLAN

for

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*(enter facility name and address)*

Federal and State Phase II storm water regulations require municipal facilities to implement an operation and maintenance program that includes an employee training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Preventing spills of materials and wastes is a significant component of complying with these regulations. However, even with the best prevention efforts, spills may still occur. When they do, it is up to facility personnel to respond quickly and effectively to cleanup the spilled material or notify someone who can. This Spill Response Plan is designed as a template for municipal facilities to develop site-specific individual Spill Response and Prevention Plans. The plan should be kept in a central location that is easily accessible for employees.

## **INSTRUCTIONS**

Each facility can use this template by filling in the blanks and completing the attached:

- Spills that require Special Cleanup,
- Materials Inventory,
- Maximum Cleanup Amounts,
- Facility Map,
- Spill Kit Inventory and labeling, and the
- Employee Training Log.

Once completed, this Plan becomes the facility's individual Plan and must be properly implemented and maintained. The finished Plan should be reviewed and updated at least annually.

Plan Implementation Date: \_\_\_\_\_

Revision Date(s): \_\_\_\_\_

\_\_\_\_\_

**Facility's Responsible Person(s)** in charge of spill response planning, implementation and maintenance of this Plan:

Name

Phone #

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**RESPONSIBILITIES**

- The **Facility Responsible Person** has primary responsibility for coordinating the response to emergencies, including chemical spills.
- **Supervisors** should ensure that employees are familiar with these procedures and receive any necessary training.
- **All employees** should follow these procedures in the event of a chemical spill.

**EMERGENCY CONTACT NUMBERS**

The following telephone numbers should be posted near telephones and in other conspicuous locations:

- Outside emergency services (police, fire department, ambulance service): 911
- Hospital: American Fork Hospital, 801-763-3300
- Facility Responsible Person: \_\_\_\_\_ Phone #: \_\_\_\_\_
- Safety Department: (if applicable): \_\_\_\_\_
- Poison Control Center: 801-222-1222
- Regional EPA Office: 303-312-6312
- State environmental agency (Utah Department of Environmental Quality: 801-536-4400)
- OSHA area office: 720-264-6550
- National Response Center: 1-800-424-8802
- Utah County Office of Emergency Management: 801-851-4130
- Pleasant Grove City Illicit Discharge Hotline: 801-785-2941
- Pleasant Grove City Dispatch: 801-785-3506
- Utah County Dispatch (Non-emergency): 801-851-4100
- Others: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **CLEAN-UP PROCEDURES**

Spilled chemicals should be effectively and quickly contained and cleaned up. Employees should clean up spills themselves **only if properly trained and protected**. Employees who are not trained in spill cleanup procedures should report the spill to the Responsible Person(s) listed above, warn other employees, and leave the area.

The Maximum Cleanup Amounts that properly trained employee can cleanup **are listed on page 8**. In the event of spills greater than these amounts, contact the appropriate responders listed in the Emergency Contact Numbers listed above.

The following general guidelines should be followed for evacuation, spill control, notification of proper authorities, and general emergency procedures in the event of a chemical incident in which there is potential for a significant release of hazardous materials.

### **1. Evacuation**

Persons in the immediate vicinity of a spill should *immediately evacuate* the premises (except for employees with training in spill response in circumstances described below). If the spill is of “medium” or “large” size, or if the spill seems hazardous, immediately notify emergency response personnel.

### **2. Spill Control Techniques**

Once a spill has occurred, the employee needs to decide whether the spill is small enough to handle without outside assistance. Only employees with training in spill response should attempt to contain or clean up a spill.

NOTE: If you are cleaning up a spill yourself, make sure you are aware of the hazards associated with the materials spilled, have adequate ventilation, and proper personal protective equipment. Treat all residual chemical and cleanup materials as hazardous waste.

Spill control equipment should be located wherever significant quantities of hazardous materials are received or stored. MSDSs, absorbents, over-pack containers, container patch kits, spill dams, shovels, floor dry, acid/base neutralizers, and “caution-keep out” signs are common spill response items.

### **3. Spill Response and Cleanup**

Chemical spills are divided into three categories: Small, Medium and Large. Response and cleanup procedures vary depending on the size of the spill.

**Small Spills:** Any spill where the major dimension is less than 18 inches in diameter. Small spills are generally handled by internal personnel and usually do not require an emergency response by police or fire department HAZMAT teams.

- Quickly control the spill by stopping or securing the spill source. This could be as simple as uprighting a container and using floor-dry or absorbent pads to soak up spilled material. Wear gloves and protective clothing, if necessary.
- Put spill material and absorbents in secure containers if any are available.
- Consult with the Facility Responsible Person and the MSDS for spill and waste disposal procedures.
- In some instances, the area of the spill should not be washed with water. Use Dry Cleanup Methods and **never** wash spills down the drain, onto a storm drain or onto the driveway or parking lot.
- Both the spilled material and the absorbent may be considered hazardous waste and must be disposed of in compliance with state and federal environmental regulations.

**Medium Spills:** Spills where the major dimension exceeds 18 inches, but is less than 6 feet. Outside emergency response personnel (police and fire department HAZMAT teams) should usually be called for medium spills. Common sense, however, will dictate when it is necessary to call them.

- Immediately try to help contain the spill at its source by simple measures only. This means quickly uprighting a container, or putting a lid on a container, if possible. Do not use absorbents unless they are immediately available. Once you have made a quick attempt to contain the spill, or once you have quickly determined you cannot take any brief containment measures, leave the area and alert Emergency Responders at 911. Closing doors behind you while leaving helps contain fumes from spills. Give police accurate information as to the location, chemical, and estimated amount of the spill.
- Evaluate the area outside the spill. Engines and electrical equipment near the spill area must be turned off. This eliminates various sources of ignition in the area. Advise Emergency Responders on how to turn off engines or electrical sources. Do not go back into the spill area once you have left. Help emergency responders by trying to determine how to shut off heating, air conditioning equipment, or air circulating equipment, if necessary.
- If emergency responders evacuate the spill area, follow their instructions in leaving the area.
- After emergency responders have contained the spill, be prepared to assist them with any other information that may be necessary, such as MSDSs and questions about the facility. Emergency responders or trained personnel with proper personal protective equipment will then clean up the spill residue. Do not re-enter the area until the responder in charge gives the all clear. Be prepared to assist these persons from outside the spill area with MSDSs, absorbents, and containers.
- Reports must be filed with proper authorities. It is the responsibility of the spiller to inform both his/her supervisor and the emergency responders as to what caused the spill. The response for large spills is similar to the procedures for medium spills, except that the exposure danger is greater.

**Large Spills:** Any spill involving flammable liquid where the major dimension exceeds 6 feet in diameter; and any “running” spill, where the source of the spill has not been contained or flow has not been stopped.

- Leave the area and notify Emergency Responders (911). Give the operator the spill location, chemical spilled, and approximate amount.
- From a safe area, attempt to get MSDS information for the spilled chemical for the emergency responders to use. Also, be prepared to advise responders as to any ignition sources, engines, electrical power, or air conditioning/ventilation systems that may need to be shut off. Advise responders of any absorbents, containers, or spill control equipment that may be available. This may need to be done from a remote area, because an evacuation that would place the spiller far from the scene may be needed. Use radio or phone to assist from a distance, if necessary.
- Only emergency response personnel, in accordance with their own established procedures, should handle spills greater than 6 feet in any dimension or that are continuous. Remember, once the emergency responders or HAZMAT team is on the job cleaning up spills or putting out fires, the area is under their control and no one may re-enter the area until the responder in charge gives the all clear.
- Provide information for reports to supervisors and responders, just as in medium spills.

## **REPORTING SPILLS**

All chemical spills, regardless of size, should be reported as soon as possible to the Facility Responsible Person. The Responsible Person will determine whether the spill has the potential to affect the environment outside of the facility and must be reported to 911 or the National Response Center at 800-424-8802. Examples of spills that could affect the outside environment include spills that are accompanied by fire or explosion and spills that could reach nearby water bodies.

Accidental releases of certain toxic substances must be reported to the Utah Department of Environmental Quality and the Utah County Office of Emergency Management.





**MATERIAL INVENTORY**

List all materials or wastes that may require clean up. List the average and maximum amounts on site and their storage locations. *(Example materials are listed for convenience only. Ignore any that do not apply and add any other materials of concern that are onsite. Use additional sheets if necessary.)*

<b><u>Material</u></b>	<b><u>Amount (avg/max)</u></b>	<b><u>Location(s)</u></b>
Antifreeze	_____	_____
Degreaser	_____	_____
Diesel Fuel	_____	_____
Fertilizers	_____	_____
Gasoline	_____	_____
Herbicides	_____	_____
Magnesium Chloride	_____	_____
Motor Oil	_____	_____
Hydraulic Oil	_____	_____
Paints/Stains	_____	_____
Pesticides	_____	_____
Solvents	_____	_____
Used Oil	_____	_____
Other	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____



**FACILITY MAP**

Attach a map or sketch of the facility showing (a) the locations of each spill response kit, (b) the locations where the materials identified on page 6 are normally stored or used, and (c) the location of each storm drain inlet or drainage ditch.

**SPILL KIT INVENTORY**

List the spill response equipment that will be maintained in each locker (refer to MSDSs to determine recommended clean-up methods and supplies):

LOCKER NUMBER OR LOCATION	ABSORBENTS (bags of loose absorbents, pags, rolls of sheets, containers of neutralizing agents)	TOOLS (shovels, brooms, dust pans, waste containers, squeegees, etc.)	PERSONAL PROTECTIVE EQUIPMENT (impervious gloves, goggles, aprons, boots, dust masks, etc.)	OTHER SUPPLIES (warning tape, labels, markers, MSDSs, etc.)

PERSON RESPONSIBLE FOR MAINTAINING THIS INVENTORY: \_\_\_\_\_

## **LABEL SPILL KITS**

- Label each spill kit prominently with the words “SPILL KIT” or “ABSORBENTS” etc.
- Label or stencil the necessary emergency telephone number(s) or pager number(s) of persons to be contacted in case of a spill or leak that is beyond the training and equipment available on or near each spill locker:

**Facility Responsible Person/Phone Number:** \_\_\_\_\_/(\_\_\_\_)\_\_\_\_ - \_\_\_\_

**Spill Response Contractor (if any)/Phone Number:** \_\_\_\_\_/(\_\_\_\_)\_\_\_\_ - \_\_\_\_

**NRC 24-Hour Emergency Spill Reporting Hot-Line: 800-424-8802**

- Stencil the following warning *PROMINENTLY* on each spill locker:

**“WARNING: NEVER HOSE DOWN A SPILL!  
CLEAN IT UP PROMPTLY AND DISPOSE OF THE  
WASTE PROPERLY.”**



# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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**APPENDIX J – SPILL/DUMPING NOTIFICATION INFORMATION**

## A Summary of Utah State and Federal Hazardous Substance/Waste/Material Environmental Regulations Requiring Immediate to Within 24 Hour Notification of Utah DEQ or EPA

Air Quality						
Regulation	When Required	Information Required	Notify Whom	Oral Notice Time	Phone Numbers	Written Notice Time
R307-107.2	Air pollution control equipment breakdown > 2 hrs	Not specified	Div. of Air Quality.	3-18 hrs	536-4000 536-4123 (off hours)	7 days
40 CFR 58	Air pollution control malfunction	Not specified	State	24 hours	536-4000 536-4123 (off hours)	14 days
40 CFR 59	Monitoring system malfunctions	Not specified	State Air Program Director.	24 hours	536-4000 536-4123 (off hours)	14 days
40 CFR 52	When in violation of National Ambient Air Quality Standards	Not specified	State Air Program Director	24 hours	536-4000 536-4123 (off hours)	
Hazardous Waste/Material/Substance						
R315-9-1(b)	Spill of one kilogram of "acutely hazardous waste", which includes: 1. "P" wastes, 2. F999 wastes (chemical warfare agents), and 3. "F" wastes with a hazard code of "H" (identified in 40 CFR 261.31 and includes wastes from the production or use of chlorphenols and chlorobenzenes). Spill of 100 kilograms of other hazardous waste. Notify for a spill of a lesser quantity if there is a potential threat to human health or the environment.	Name, phone number, and address of responsible party. Name, title and phone of person reporting. Time and date of the spill. Spill location. Nearest town, city, highway or waterway. Waste description and amount. Cause. Extent of injuries. Potential hazards to human health or the environment. Estimated quantity and disposition of recovered material.	Div. of Solid & Hazardous Waste	Immediately	538-6170 536-4123 (off hours)	15 days
40 CFR 263.30	When a transporter spills a hazardous waste, immediate action must be taken to protect the environment, including notification of local authorities.	Not specified	Div. of Solid & Hazardous Waste	Immediately	538-6170 536-4123 (off hours)	
CERCLA 103	Any CERCLA listed substance spilled over the reportable quantity into the environment.	Name, phone number, and address of responsible party; name, title and phone of person reporting; time and date of the spill; spill location; nearest town, city, highway or waterway; waste description and amount; cause; action taken.	NRC	Immediately	1-800-424-8802	
40 CFR 302.6	Discharge of a hazardous substance in quantities greater than the reportable quantity over 24 hours	Not specified	NRC	Immediately	1-800-424-8802	



**Hazardous Waste/Material/Substance Continued**

<b>Regulation</b>	<b>When Required</b>	<b>Information Required</b>	<b>Notify Whom</b>	<b>Oral Notice Time</b>	<b>Phone Numbers</b>	<b>Written Notice Time</b>
49 CFR 171.15  49 CFR 195.52	Hazardous materials release (as defined by DOT in 29 CFR 171.8) causes death, serious injury, major property damage, evacuation, closure of a major highway, aircraft flight path altered, pollution of a water body, release of infectious substance, or continuing danger to life	Reporter name and phone number, name and address of carrier, incident date, time and location, extent of injuries, classification, name and quantity of hazardous materials involved, type of incident and nature of hazardous materials involvement, whether a continuing danger to life exists.	NRC	earliest practicable moment	1-800-4248802	30 days (see 49 CFR 171.16 for details)
EPCRA 304 40 CFR 355.40	Release of "Extremely Hazardous Substance" or CERCLA substance, over the RQ, exposing persons outside the facility boundaries	Chemical name, quantity, release time and duration, health risks, medical advice, precautions, contact names and phone numbers	LEPC SERC	Immediately	Various 536-4123 (24 hours)	As soon as practicable
R315-8-4.7(a) R315-7-11.7(a)	Any imminent or actual emergency at a hazardous waste Treatment, Storage or Disposal (TSD) permitted facility	Facility name, address, EPA ID number; Incident date, time and type. Quantity of waste. Injuries.	DEQ, federal OSC, State and local response agencies	Immediately		15 days
40 CFR 264.56/ 265.56 40 CFR 279.52	Imminent or actual emergency situation at a TSD or used oil processor or used oil refiner facility	Facility name, address, EPA ID number. Incident date, time and type. Quantity of waste. Injuries. Possible hazards to human health or the environment outside the facility.	State and local response agencies, NRC	Immediately	1-800-424-8802	15 days
40 CFR 262.34 40 CFR 264.56	When a fire, explosion or other release at a hazardous waste generator or TSD facility could threaten human health outside the facility, or when the spill has reached surface water	Facility name, address, EPA ID number Incident date, time and type. Quantity of waste Injuries. Quantity of recovered materials. Possible hazards to human health or the environment outside the facility.	NRC	Immediately	1-800-424-8802	15 days
R315-8-4.7(d) R315-7-11.7(d)	When a fire, explosion or other release at a hazardous waste TSD facility could threaten human health or the environment outside the facility	Name and phone number of reporter. Facility name, address. Incident date, time and type. Name and quantity of waste. Injuries. Human health or environmental hazards.	DEQ Federal OSC NRC	Immediately	538-4170 1-303-293-1788 1-800-424-8802	5 days
R315-3-10(i)(6)  40 CFR 270.30	Any TSD permittee noncompliance which may endanger health or the environment	Releases of hazardous waste that may cause endangerment to public drinking water systems. Information on releases of hazardous waste or fire or explosions which could threaten the environment or human health outside the facility. Name and phone number of reporter. Facility name, address. Incident date, time and type. Name and quantity of waste. Injuries. Description of occurrence. Human health or environmental hazards. Estimated quantity and disposition of recovered material.	Div of Solid & Hazardous Waste	24 hours	536-6170	5 days

**Hazardous Waste/Material/Substance Continued**

<b>Regulation</b>	<b>When Required</b>	<b>Information Required</b>	<b>Notify Whom</b>	<b>Oral Notice Time</b>	<b>Phone Numbers</b>	<b>Written Notice Time</b>
40 CFR 264.196(d) 265.196(d)  R315-8-10 R315-7-12	When a hazardous waste disposal facility discovers a tank or secondary containment system leak	Not specified	EPA administrator  Div of Solid & Hazardous Waste	24 hours	1-303-293-1788  538-6170	
40 CFR 761.125	When PCB contaminated material contaminates surface water, sewers, drinking water, grazing lands or vegetable gardens.	Not specified	EPA Region	24 hours	1-303-293-1788	
40 CFR 302.6	Release of PCB's into the environment in amounts greater than 1 pound.	Not specified	NRC	Immediately	1-800-424-8802	
R315-303-5(7)(c)	When a landfill operator discovers receipt of a hazardous waste or PCB contaminated waste	Not specified	Div of Solid & Hazardous Waste, Hauler, Generator	24 hours	538-6170 536-4123 (off hours)	
R315-303-4-(5)	When methane levels at a landfill exceed state limits in R315-303(2)(a)	Not specified	Div. of Solid & Hazardous Waste	Immediately	538-6170 536-4123 (off hours)	
40 CFR 258.23	When methane levels at a landfill exceed specified federal limits.	Not specified	State Director	Immediately	538-6170 536-4123 (off hours)	
<b>Radioactive Materials</b>						
R313-38-77(2)(b)	If a sealed radiation source or device containing radioactive material is damaged, or if contamination is detected at the surface after the source is used in a subsurface tracer study.	Circumstances of the loss and request approval of abandonment procedures	Div of Rad. Control	Immediately	536-4250 536-4123 (off hours)	
R313-38-77(5)(b)	If radioactive material has been lost in or to an underground potable water source.	Well location. Magnitude and extent of radioactive material loss. Consequences of such loss. Efforts being taken to mitigate these consequences.	Div of Rad. Control	Immediately	536-4250 536-4123 (off hours)	
R313-32-33(1)	Misadministration of a radioactive material in a therapy procedure	Not specified	Div of Rad. Control	24 hours	536-4250 536-4123 (off hours)	
R313-15-1202(1)	Event involving a radioactive material which caused or threatens to cause a specified exposure or specified amount of property damage	Not specified	Div. of Rad. Control	Immediately	536-4250 536-4123 (off hours)	

<b>Radioactive Materials Continued</b>						
<b>Regulation</b>	<b>When Required</b>	<b>Information Required</b>	<b>Notify Whom</b>	<b>Oral Notice Time</b>	<b>Phone Numbers</b>	<b>Written Notice Time</b>
R313-15-1202(2)	Loss of licensed or registered source of radiation that may have caused or threatens to cause a specified exposure or specified amount of property damage.	Not specified	Div. of Rad. Control	24 hours	536-4250 536-4123 (off hours)	
<b>Releases From Underground Storage Tanks</b>						
Utah Code 19-6-420 (3)	Releases from an underground storage tank presenting the possibility of an imminent and substantial danger to public health or the environment	Abatement action taken	Div. of Env. Response & Remediation	24 hours	<b>536-4123 (24 hours)</b>	
R311-201-7	Discovery of a release from an underground storage tank	Not specified	Div. of Env. Response & Remediation	24 hours	<b>536-4123 (24 hours)</b>	
40 CFR 280.50	Release of a regulated substance, unusual operation conditions or monitoring results that indicate a release	Not specified	State	24 hours	<b>536-4123 (24 hours)</b>	
40 CFR 280.53	A spill or overflow that is: 1. > 25 gallons; or 2. causes a sheen on surface water; or 3. > reportable quantity of a CERCLA hazardous substance into the environment; or 4. In violation of Clean Water Act 311(b)(3)	Not specified	Div. of Env. Response and Remediation (see also ref 8,31,32)	24 hours	<b>536-4123 (24 hours)</b>	
<b>Used Oil</b>						
R315-15-9	Used oil spills > 25 gallons or potential threat to human health or environment.	Name, phone number and address of person responsible for spill. Name, title and phone number of individual reporting. Time and date of spill. Spill location - including nearest city, highway, or waterway. Amount and description of material spilled. Cause of the spill. Action taken to minimize threats to human health and the environment.	DEQ	Immediately	536-4123	15 Days

Water Quality						
Regulation	When Required	Information Required	Notify Whom	Oral Notice Time	Phone Numbers	Written Notice Time
Utah Code 19-5-114	Spill of substance which could pollute the waters of the state	Material, actions taken, cleanup and disposal plan	Div. of Water Quality	Immediately	538-6146 536-4123 (off hours)	
40 CFR 110	If oil or hazardous substance release: (1) causes a sheen; or (2) violates water quality standards; or (3) causes sludge or emulsion to be deposited below water level	Not specified	NRC	Immediately	1-800-424-8802	
R317-8-4 (b)(12)(f)	Any UPDES permittee noncompliance which may endanger health or the environment including, but not limited to: (1) unanticipated bypasses which exceed effluent permit limitations; (2) any upset which exceeds effluent limitation; (3) violation of maximum daily discharge limitation for permit listed pollutants.	Name and telephone number of reporting party. Time and type of incident. Name and quantity of materials released Injuries. Health hazards	Div. of Water Quality	24 hours	538-6146 536-4123 (off hours)	5 days
R318-8.10 (7)(b) R318-8.13 (c) and 8.14 (3)(b)	1. Sampling indicates a violation of water pollution control pretreatment standards. 2. A pretreatment system "upset" that exceeds pretreatment standards. 3. An unanticipated pretreatment bypass.	Not specified	"Control Authority", which is DEQ or the POTW, depending on the permit.	24 hours		
40 CFR 403.12 40 CFR 403.16/17	1. Sampling indicates a violation of water pollution control pretreatment standards. 2. A pretreatment system "upset" that exceeds pretreatment standards. 3. An unanticipated pretreatment bypass.	Not specified	"Control Authority", which is DEQ or the POTW, depending on the permit.	24 hours		
R317-6-6.13	Mechanical or discharge system failures affecting the chemical characteristics or volume of a ground water discharge	Not specified	Div. of Water Quality	Immediately	538-6146 536-4123 (off hours)	30 days
R317-6-6.11	Commencement of groundwater discharge	Not specified	Div of Water Quality	Immediately	538-6146 536-4123 (off hours)	
R317-6-6.11	Discontinuance of groundwater discharge due to spill, leak or accidental release	Not specified	Div. of Water Quality	Immediately	538-6146 536-4123 (off hours)	5 days
R317-6-6.18	Out of compliance with ground water discharge permit	Not specified	Div. of Water Quality	Immediately	538-6146 536-4123 (off hours)	5 days

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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APPENDIX K – 80<sup>TH</sup> PERCENTILE STORM DOCUMENTATION

**To:** Marty Beaumont, PE  
Public Works Director/City Engineer  
Pleasant Grove

**From:** Jonathan M. Clegg, P.E.

**Date:** February 5, 2020

**Subject:** 80<sup>th</sup> Percentile Rainfall Analysis



Memorandum

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### Executive Summary

As required by the Official Draft version of the Utah Department of Environmental Quality General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Permit No. UTR090000 (dated December 14, 2019), the 80<sup>th</sup> percentile rainfall event was determined using hourly precipitation records from 5 local weather stations. The 80<sup>th</sup> percentile values ranged from 0.42 inches to 0.63 inches with an average of 0.50 inches. Considering years of record of each station and each station's comparability to Pleasant Grove, the recommended 80<sup>th</sup> percentile rainfall value is 0.50 inches.

### Purpose and Background

On December 24, 2019, the Utah Department of Environmental Quality (UDEQ) issued a Draft General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Permit No. UTR090000 (Permit). The Permit contains the following requirement:

*By March 1, 2020, new development projects that disturb land greater than or equal to one acre, including projects that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one acre must manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 80th percentile rainfall event or a predevelopment hydrologic condition, whichever is less...The 80th percentile rainfall event is the event whose precipitation total is greater than or equal to 80 percent of all storm events over a given period of record.*

*By March 1, 2020, redevelopment projects that disturb greater than or equal to one acre, including projects less than an acre that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one acre must provide a site-specific and project-specific plan aimed at net gain to onsite retention or a reduction to impervious surface to provide similar water quality benefits. If a redevelopment project increases the impervious surface by greater than 10%, the project shall manage rainfall on-site, and prevent the off-site discharge of the net increase in the volume associated with the precipitation from all rainfall events less than or equal to the 80th percentile rainfall event.*

This technical memo outlines the development of the 80<sup>th</sup> percentile rainfall event for Pleasant Grove including the data sources, methodology used, and results. In this memo, the terms rainfall and precipitation are used synonymously even though precipitation can fall as rain or snow.

## Methodology

The steps outlined below were followed to develop the 80<sup>th</sup> percentile rainfall event for Pleasant Grove (Reference 1).

- 1) Obtain a long-term rainfall record from a nearby weather station.
- 2) Edit out small rainfall events that are 0.1 inches or less and snowfall events that do not immediately melt. Events less than 0.1 inch are excluded because they do not generally result in any measurable runoff due to absorption, interception and evaporation.
- 3) Analyze the rainfall time series and develop a frequency analysis to determine the percentage of rainfall events greater than or equal to a given numerical value (e.g., 0.2, 0.5, 1.0, 1.5 inches, etc).
- 4) Construct a table and curve showing rainfall depth versus percentile.
- 5) Use the data to define the 80th percentile rainfall depth.

## Procedure

### Step 1: Obtain long-term rainfall data

A review of historic hourly rainfall data available from the NOAA National Centers for Environmental Information website (Reference 2) (NOAA) indicated that there are 11 weather stations near Pleasant Grove. See Figure 1 and Table 4. Of these 11 stations, only the following three have the minimum recommended period of record of 30 years: Fairfield, Olmstead PH, and Provo BYU. The stations Provo Radio KAYK and Upper American Fork PH have almost 25 years and 21 years respectively and were therefore include in this analysis.

Hourly rainfall data was obtained from NOAA for the 5 stations shown in Table 1:

Table 1: Stations Used in Analysis

	Station Name	Station ID	Period of Record		
			Begin Date	End Date	Duration (years)
1	FAIRFIELD, UT US	COOP:422696	9/1/1950	12/22/2013	63
2	OLMSTEAD P H, UT US	COOP:426455	2/1/1977	12/23/2013	37
3	PROVO BYU, UT US	COOP:427064	9/1/1980	12/23/2013	33
4	PROVO RADIO KAYK, UT US	COOP:427068	4/1/1952	3/1/1977	25
5	UPPER AMERCN FORK PH, UT US	COOP:428939	6/1/1986	4/1/2007	21

The hourly data for each station was processed to determine individual storm events. A minimum inter-event duration of 6-hours was used to separate individual storms. Storm events separated by at least 6 hours with no precipitation were considered to be separate storm events.

### Step 2: Remove small rain events

All storm events that produced 0.10 inches of precipitation or less were removed from each station record. The NOAA hourly precipitation data did not distinguish snow events from rain events. So, for the remaining storms events, it was assumed that all precipitation that fell as snow melted quickly enough to generate runoff.

### Step 3: Perform statistical analysis

For each station, the number of storms that generated rainfall were counted and ordered by increasing depth in 0.01-inch increments beginning with 0.11 inches. For each depth, the sum of all storms of equal or lesser depth was determined and the percentile of each depth was then calculated. The results are presented in table and chart form in Step 4.

Step 4: Tabulate and chart the results

Table 2 shows the rainfall depth associated with various percentiles for each station. The results in graphic format are shown in Figure 2 through Figure 6.

Table 2: Rainfall Percentiles for 5 Stations

Station	Rainfall Depth by Percentile									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Fairfield	0.17	0.19	0.20	0.20	0.28	0.29	0.39	0.49	0.59	2.40
Olmstead PH					0.23	0.28	0.34	0.42	0.57	2.10
Provo BYU	0.14	0.17	0.20	0.22	0.29	0.32	0.40	0.52	0.76	2.95
Provo KAYK	0.13	0.16	0.19	0.20	0.25	0.29	0.35	0.46	0.60	1.30
Upper AF PH				0.23	0.29	0.36	0.46	0.63	0.90	3.20

Shaded cells have insufficient data to calculate a percentile value.

Step 5: Determine the 80<sup>th</sup> percentile rainfall event

Table 3 summarizes the results.

Table 3: 80<sup>th</sup> Percentile Analysis Summary

Station	80 Percentile Precipitation Depth (inches)	Period of Record	Years of Record	# of Storms
Fairfield	0.49	1950 - 2013	63	1411
Olmstead PH	0.42	1977 - 2013	37	1026
Provo BYU	0.52	1980 - 2013	33	1311
Provo KAYK	0.46	1952 - 1977	25	1156
Upper AF PH	0.63	1986 - 2007	21	716
Average	0.50		36	1124
Average of stations with 30 yrs+ of records	0.47		44	1249

**Conclusion & Recommendation**

Based on the methodology outlined in this memo, rainfall percentiles were developed for 5 weather stations in the vicinity of Pleasant Grove. The 80<sup>th</sup> percentile for each station was determined. The 80<sup>th</sup> percentile for all five stations ranges from 0.42 inches to 0.63 inches with an average of 0.50 inches. The 80<sup>th</sup> percentile for the three stations with more than 30 years of record ranges from 0.42 inches to 0.52 inches with an average of 0.47 inches.

None of these stations is located in Pleasant Grove and each is affected differently by its unique topographic and meteorological setting (e.g. elevation, proximity to mountains and water bodies). Upper AF PH station likely has greater precipitation than Pleasant Grove due to its higher elevation and location within the mountains. If the Upper AF PH station is excluded, the remaining stations still yield an average of 0.47 inches. Excluding this station does not change the recommendation.

A rainfall depth of 0.50 inches is recommended for use by Pleasant Grove to meet the requirements of the UDEQ MS4 General Permit.



Figure 1: Nearby Weather Stations

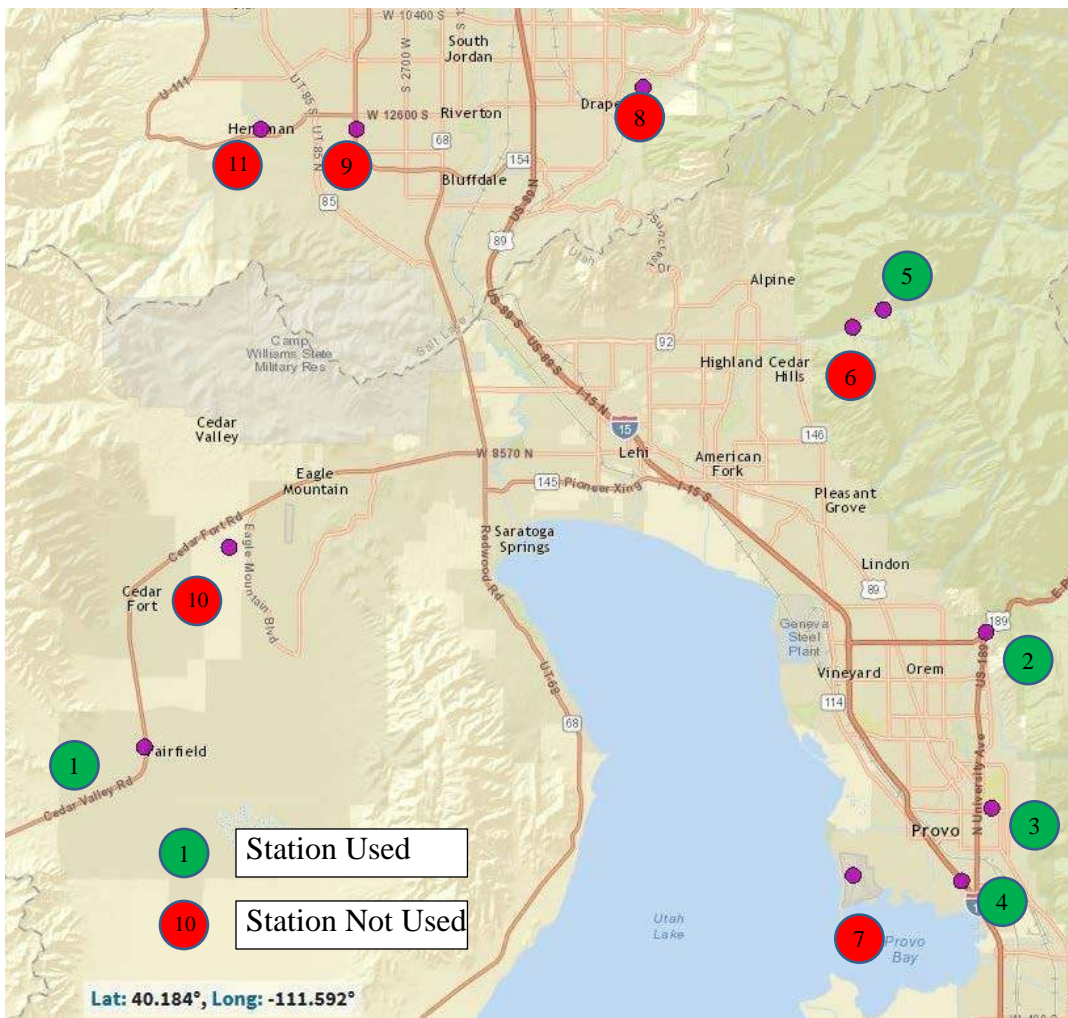


Table 4: Nearby Weather Stations

			Period of Record			
			Begin Date	End Date	Duration (years)	
Station Name			Station ID			
Used	1	FAIRFIELD, UT US	COOP:422696	8/31/1950	12/22/2013	63
	2	OLMSTEAD P H, UT US	COOP:426455	1/31/1977	12/23/2013	37
	3	PROVO BYU, UT US	COOP:427064	8/31/1980	12/31/2013	33
	4	PROVO RADIO KAYK, UT US	COOP:427068	3/31/1952	2/28/1977	27
	5	UPPER AMERCN FORK PH, UT US	COOP:428939	5/31/1986	3/31/2007	21
Not Used	6	TIMPANOGOS CAVE, UT US	COOP:428733	3/31/2007	12/24/2013	7
	7	PROVO AIRPORT, UT US	COOP:427061	6/30/1948	4/30/1952	4
	8	DRAPER, UT US	COOP:422233	11/30/1964	9/29/1968	4
	9	RIVERTON, UT US	COOP:427343	6/30/1965	9/20/1968	3
	10	FAIRFIELD CAA AIRPORT, UT US	COOP:422697	6/30/1948	7/31/1950	2
	11	HERRIMAN, UT US	COOP:423867	9/30/1963	7/31/1965	2

Figure 2: Fairfield

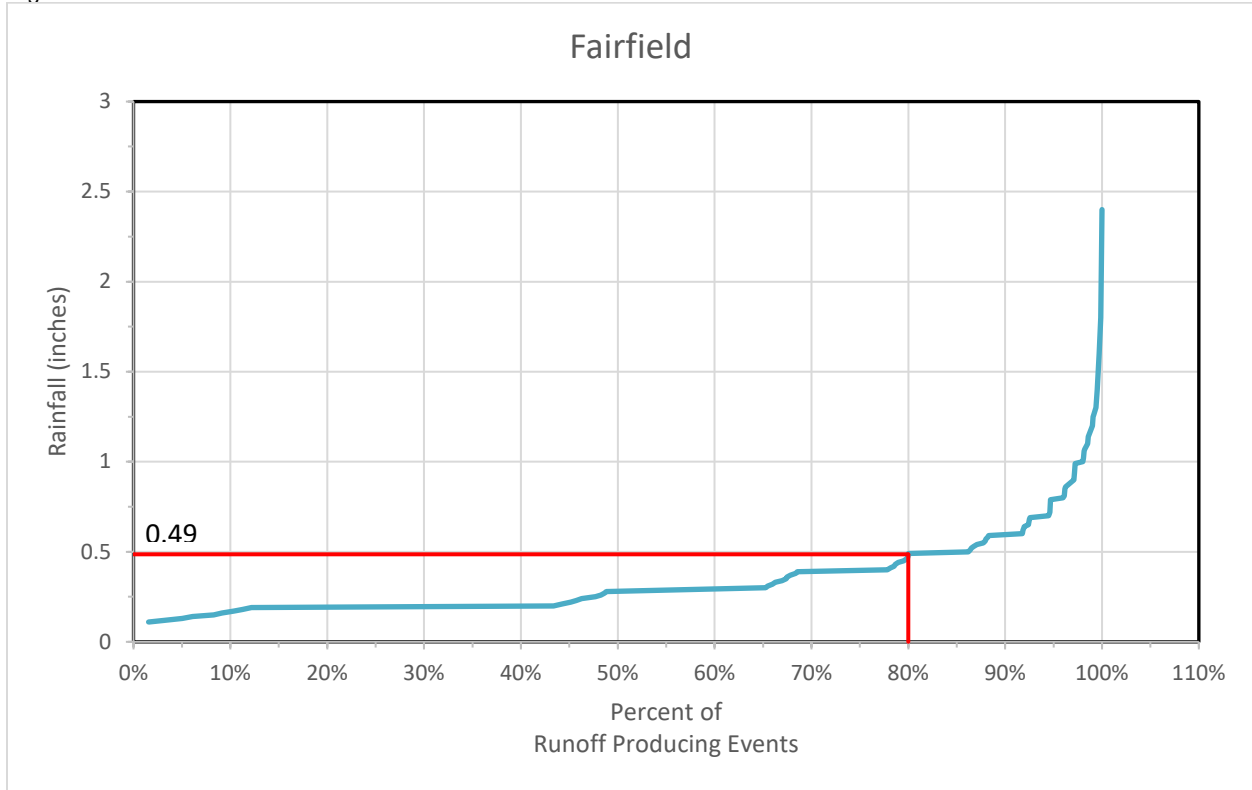


Figure 3: Olmstead PH

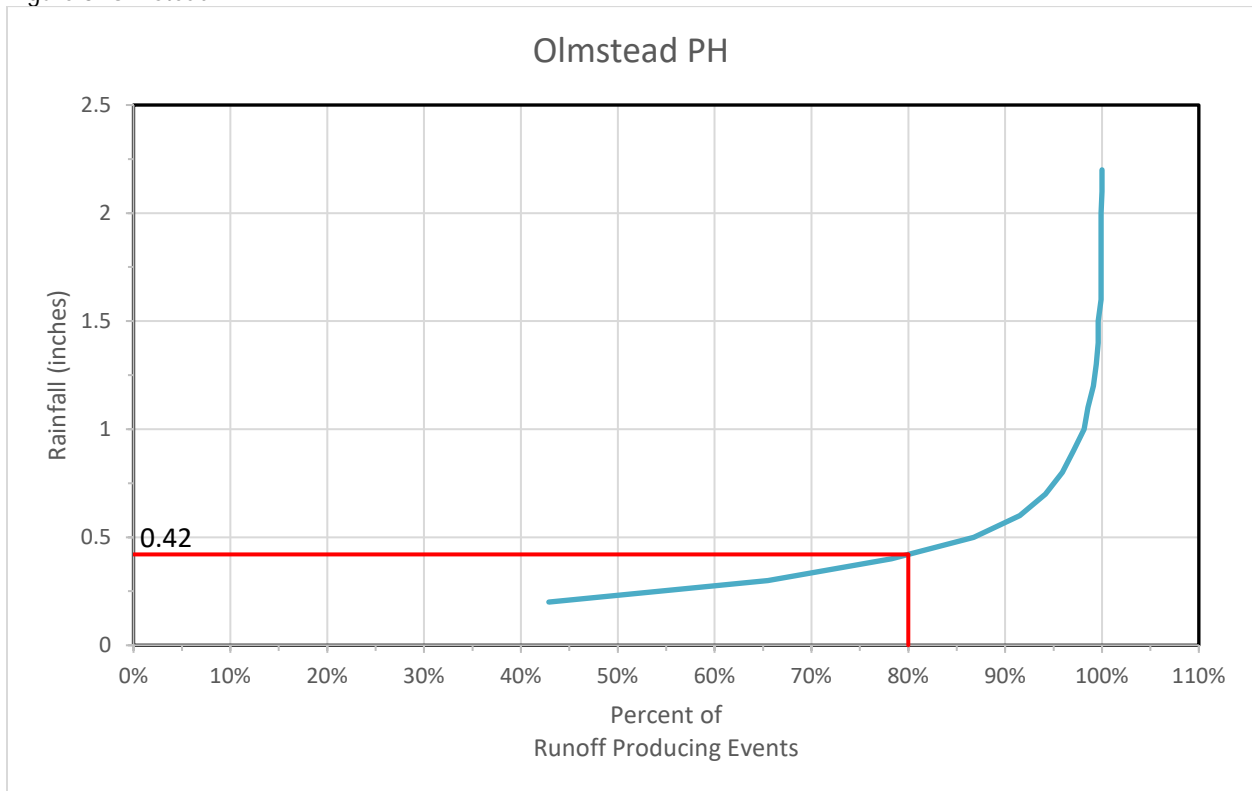


Figure 4: Provo BYU

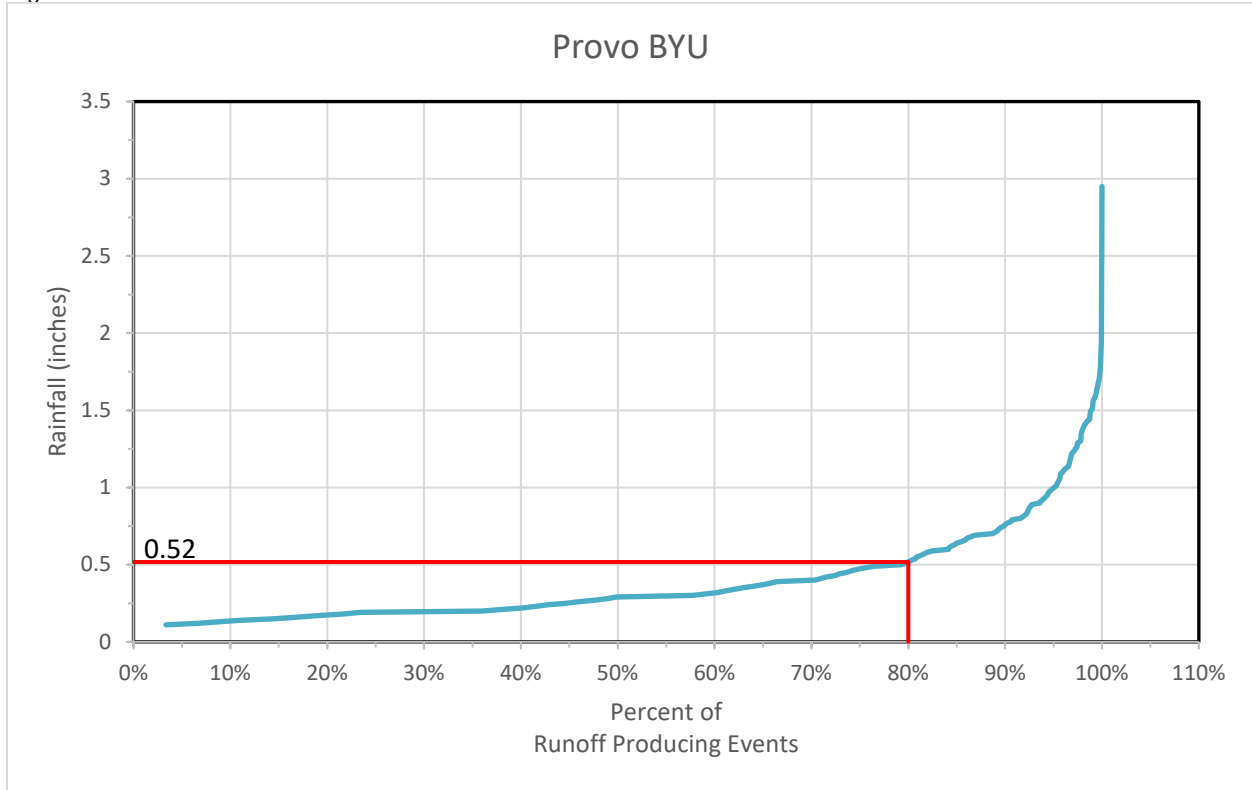


Figure 5: Provo KAYK

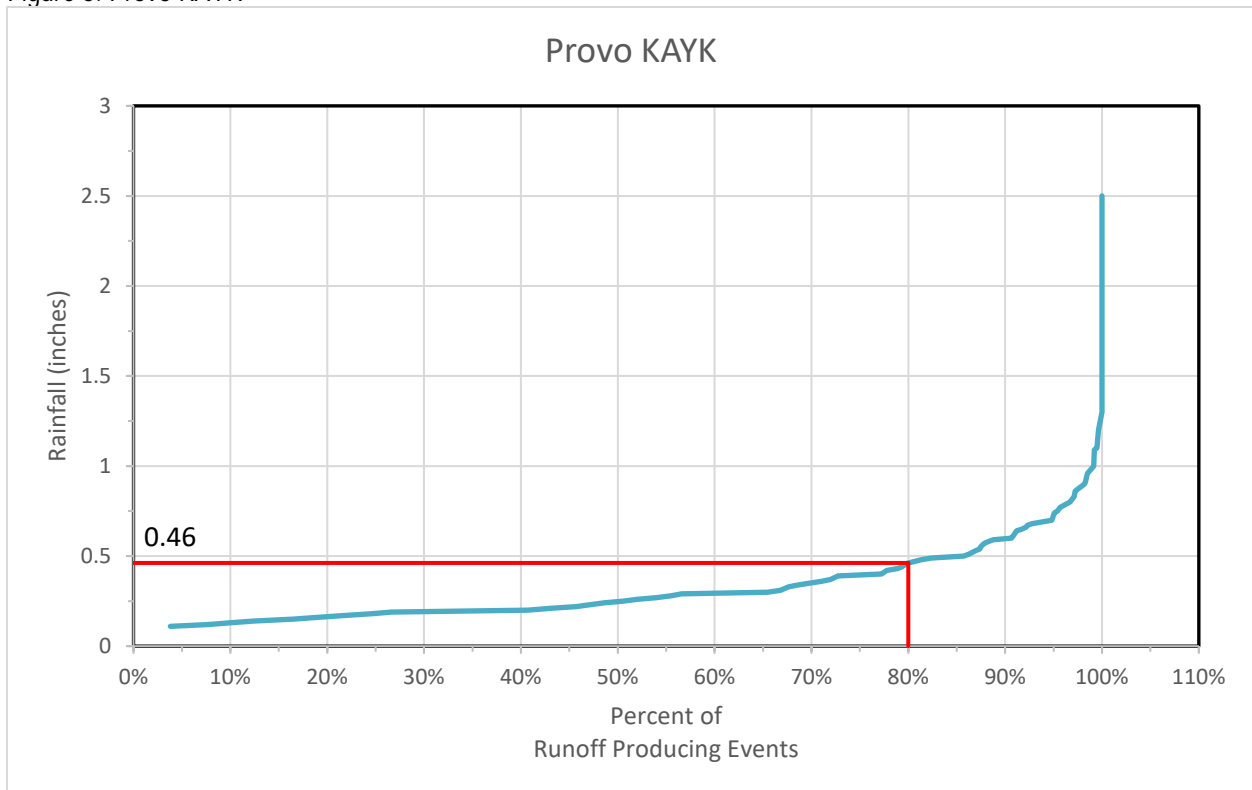
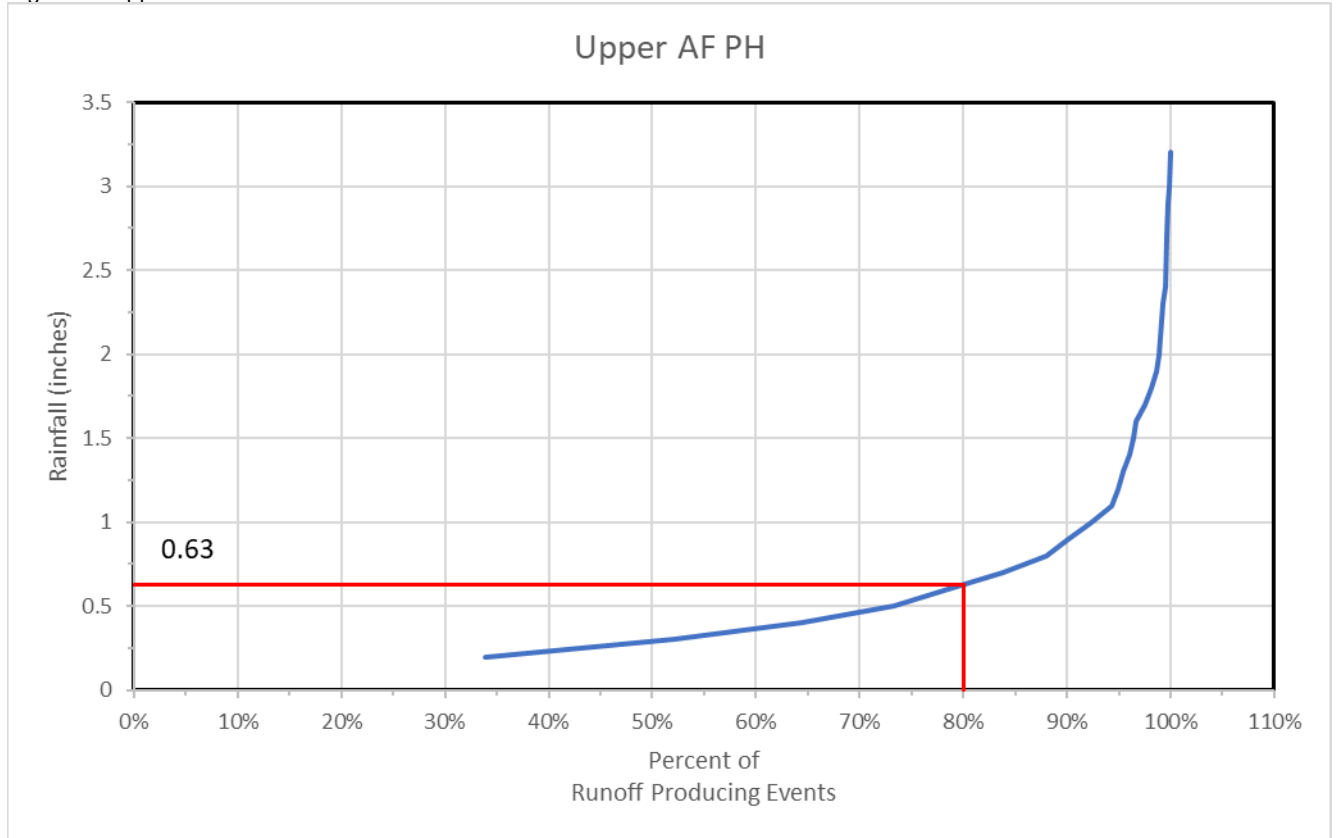


Figure 6: Upper American Fork PH



References:

- 1) Schueler, T., Hirschman, D., Novotney, M., and J. Zielinski. 2007. Urban Watershed Restoration Manual No. 3: Urban Stormwater Retrofit Practices, Table 1.3.
- 2) National Oceanic and Atmospheric (NOAA) National Centers for Environmental Information, Climate Data Online website. <https://www.ncdc.noaa.gov/cdo-web/>. Hourly Precipitation Data. Accessed April 18, 2016. Verified January 16, 2020.

# Pleasant Grove



Utah's City of Trees

## Storm Water Management Plan

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### APPENDIX K – LID HANDBOOK

See State of Utah Division of Water Quality “A Guide to Low Impact Development within Utah”