

**Douglas County, Colorado  
Stormwater Management Facility Operation and Maintenance  
Manual**

**Prepared for:**

**Prepared by:**

**Reference:**

**This manual is adapted from Town of Parker, Colorado, *STORMWATER PERMANENT BEST MANAGEMENT PRACTICES (PBMP) LONG-TERM OPERATION AND MAINTENANCE MANUAL*, October 2004**

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## **Stormwater Management Facility Operation and Maintenance (O&M) Guidance Document**

### **I. Reasons for Stormwater Facility Maintenance**

#### **A. Compliance with Douglas County Stormwater Management Facility Maintenance Requirements**

Owners or managers of property located within the unincorporated limits of Douglas County are required to maintain all Stormwater Management Facilities located on the property. Requirements for inspection and maintenance are located in this Stormwater Management Facility Operation and Maintenance (O&M) Guidance Document. Additional information can be obtained by contacting the Douglas County Public Works-Engineering Department.

#### **B. Preventive Measures to Reduce Maintenance Costs**

The most effective way to maintain your water quality facility is to prevent the pollutants from entering the facility in the first place. Common pollutants include sediment, trash and debris, chemicals, pet wastes, runoff from stored materials, illicit discharges into the storm drainage system and many others. A comprehensive maintenance program will include measures to address these potential contaminants, and will save money and time in the long run. Key points to consider in your maintenance program include:

- Educate property owners/residents to be aware of how their actions impact water quality, and how they can help reduce maintenance costs.
- Keep properties, streets and curb & gutters, and parking lots free of trash, debris, and lawn clippings.
- Ensure the proper disposal of hazardous wastes and chemicals.
- Plan lawn care to minimize the use of chemicals and pesticides.
- Sweep paved surfaces and put the sweepings in a compost pile or back on the lawn.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean out the upstream components of the storm drainage system, including inlets, storm sewers and outfalls.
- Do not store materials outdoors (including landscaping materials) unless they are properly protected from stormwater runoff.

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## **II. General Location and Description of Stormwater Management Facilities**

### **A. General Site Description**

Inspection or maintenance personnel may utilize the stormwater management facility site plan located in Appendix B containing the locations of the Stormwater Management Facilities within this development.

## **III. Stormwater Management Facilities**

### **A. Volume Reduction Facilities**

### **B. Treatment Facilities**

### **C. Storage Facilities**

### **D. Nonstructural Best Management Practices**

### **E. Open Channels**

## **IV. Access and Easements**

All stormwater management facilities located on the site have both a designated access location as well as a maintenance easement. Refer to the site plan located in Appendix B for access and easement locations.

## **V. Safety**

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper

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training or equipment. A confined space should never be entered without at least one additional person present.

If a highly toxic or flammable substance is discovered, the inspector(s) should leave the immediate area and contact the Douglas County Sheriff at **911**. If there is any question about a substance, leave the area immediately and contact the Douglas County Sheriff at **(303) 660-7500**. Also, never open a sealed container to check the contents.

Potentially dangerous (e.g., fuel, chemicals, hazardous materials) substances found in the areas must be referred to the Douglas County Sheriffs Office immediately for response by the Hazardous Materials Unit. The emergency contact number is **911**.

Vertical drops may be encountered in areas located within and around the facility. Avoid walking on top of retaining walls or other structures that have a significant vertical drop. If a vertical drop is identified within the stormwater management facility that is greater than 48" in height, make the appropriate note/comment on the maintenance inspection form.

**If any hazard is found within the facility area that poses an immediate threat to public safety, contact the Douglas County Sheriff's Office immediately!**

## **VI. Field Inspection Equipment**

It is imperative that the appropriate equipment is taken to the field with the inspector(s). This is to ensure the safety of the inspector and allow the inspections to be performed as efficiently as possible. Below is a list of the equipment that may be necessary to perform the inspections of a Stormwater Management Facilities:

- Protective clothing and boots.
- Safety equipment (vest, hard hat, confined space entry equipment).
- Communication equipment.
- Douglas County Approved Operation and Maintenance Manual for the site including stormwater management facility location maps.
- Clipboard.
- Stormwater Maintenance Facility Maintenance Inspection Forms (See Appendix D).
- Manhole Lid Remover.
- Shovel.
- First Aid Kit

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Some of the items identified above need not be carried by the inspector (manhole lid remover, shovel, and confined space entry equipment). However, this equipment should be available in the vehicle driven to the site.

## **VII. Inspecting and Maintaining Stormwater Management Facilities**

The quality of stormwater entering the waters of the state within the County relies heavily on the proper operation and maintenance of permanent best management practices.

This section contains a general overview of stormwater management facility O&M guidelines and documentation procedures. Appendix A contains the Standard Operating Procedures (SOP) for each of the stormwater management facilities located on site.

### **A. Inspection Procedures**

All stormwater management facilities shall be inspected by a qualified individual at a minimum of one time per year. Inspections should follow the inspection guidance found in the SOP located in Appendix A of this manual. The person(s) conducting the inspection activities shall complete the appropriate inspection report located in Appendix D. A copy of each inspection form shall be kept indefinitely and provided to Douglas County upon request.

### **B. Maintenance Procedures**

Stormwater Management Facility Maintenance Programs are separated into three broad categories of work. These categories were based largely on the Urban Drainage and Flood Control District's Maintenance Program for regional drainage facilities. The categories are separated based upon the magnitude and type of the maintenance activities performed. A description of each category follows:

#### **1. Routine Work**

The majority of this work consists of regularly scheduled mowing and trash and debris pickups for stormwater management facilities during the growing season. This includes items such as the removal of debris/material that may be clogging the outlet structure well screens and trash racks. It also includes activities such as weed control, mosquito treatment, and algae treatment. These activities normally will be performed numerous times during the year. These items can be completed without any prior correspondence with Douglas County.

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## 2. Minor Work

This work consists of a variety of isolated or small-scale maintenance/operational problems. Most of this work can be completed by a small crew with hand tools, and small equipment. These items require completed inspection forms.

## 3. Major Work

This work consists of larger maintenance/operational problems and failures within the stormwater management facilities. Most of this work requires consultation with the Douglas County Engineering Department to ensure the proper maintenance is performed. Some of this work requires that the engineering staff review the original design and construction drawings to assess the situation and assign the necessary maintenance. This work may also require more specialized maintenance equipment, design/details, surveying, or assistance through private contractors and consultants. A Grading, Erosion and Sediment Control (GESC) Permit or Annual Maintenance GESC Permit will be required before any Major Maintenance Work. Please refer to the Douglas County GESC Manual for additional information.

### **C. Maintenance Personnel**

Maintenance personnel must be qualified to properly maintain stormwater management facilities. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

### **D. Stormwater Management Facility Maintenance and Inspection Forms**

The Stormwater Management Facility Maintenance and Inspection Form provides a record of each inspection. A separate form shall be filled out in the field for all stormwater management facilities inspected. If a stormwater management facility cannot be inspected, the inspector shall record an explanation of the circumstances on the form. The stormwater management facility specific inspection form(s) is/are located in Appendix D. A description of each part of the form follows:

#### 1. General Information

This section identifies the Project Name/Subdivision, Stormwater Management Facility Location (address or cross streets), and Type of BMP (Stormwater Management Facility).

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2. Maintenance Activities Required.

Inspect the Stormwater Facility based on the SOP located in Appendix A and the categories outlined on the Stormwater Management Facility Maintenance and Inspection Form located in Appendix D. Once completed determine the maintenance requirements and complete.

3. Inspection Sign Off

The Inspector shall fill in the date of the inspection and sign off on each form.

**E. Completed Maintenance Forms**

Completed maintenance forms shall be kept on file by the property owner. Douglas County may request submittal of inspection forms at any time.



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**VIII. Appendices**

**Appendix A  
Standard Operating Procedures**

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## **Appendix B Site Plan**

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## **Appendix C Construction Drawings**

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**Appendix D**  
**Stormwater Management Facility**  
**Maintenance and Inspection Form**

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## **Appendix E Pictures of Finished Site**