



INSPECTION AND MAINTENANCE OF MS4 STRUCTURAL CONTROLS

ENVIRONMENTAL GUIDELINE



Activity Description	3
Potential Environmental Risks.....	4
Recommended Operating Controls.....	4
Prohibited Activities	4
General Considerations.....	4
Training Requirements	5
Storage and Materials Management	5
Emergency Response	6
Tenant Inspection and Maintenance Requirements.....	6
Tenant Expected Records and Outputs	6
DEN Inspection and Maintenance Requirements.....	6
Detention Facilities.....	7
Improved and Unimproved Drainage Ways and Storm Sewer System	7
DEN Expected Records and Outputs	7
References.....	7
Contacts	8
Guidance Materials	8
Related Environmental Guidelines.....	8
Applicable Regulations.....	8
Other Documents.....	9
Pond Inspection Checklist	10



ACTIVITY DESCRIPTION

Stormwater control structures in the City and County of Denver (CCD) are maintained pursuant to the requirements of Colorado Discharge Permit System (CDPS) Permit No. COS-000001 for stormwater discharges from CCD's Municipal Separate Storm Sewer System (MS4). At DEN, structural controls are maintained under two separate sets of requirements. Ponds and conveyances associated with the stormwater system are managed pursuant to the requirements in the CCD MS4 permit. Ponds and conveyances associated with industrial systems [such as the spent ADF collection system] are managed in accordance with Maintenance of Sewer System Work Instruction.

This document applies to MS4 structures used in the conveyance of stormwater flows through DEN to receiving waters of the State. These structures include, but are not limited to, storm sewer inlets, detention ponds, improved and unimproved channels, the storm sewer collection system, catch basins, and siphons.

Each operator and tenant conducting the inspection and maintenance of MS4 structural controls is responsible for understanding the applicable regulations and managing their activities accordingly; this Environmental Guideline is meant as guidance only and does not supersede any regulations.

Municipally owned structural controls should be inspected on a periodic basis to reduce pollutants in discharges from the MS4, ensure protection of the City's MS4 system and State receiving waters, and ensure proper functioning of the MS4 system. Improper operation due to lack of inspection and maintenance can lead to storm sewer overflows (flooding) and excessive debris build up, which leads to other environmental concerns.

Regional drainage ways at DEN are maintained by the Mile High Flood Control District (MHFCD). Pond T-239 is maintained by MHFCD. In addition, the Peña Boulevard Ponds will be inspected and maintained as detailed in the MOU between the City and County of Denver Department of Transportation and Infrastructure (DOTI) and the developers.

Maintenance of structural controls shall, at a minimum, meet or exceed recommendations outlined in the most recent version of the Mile High Flood Control District's Urban Storm Drainage Criteria Manual's Volume 3 – Best Management Practices.

* This EG is one of several specifically identified procedures for activities/facilities that are required by the Pollution Prevention/Good Housekeeping section of CCD's MS4 permit. Related procedures not specially addressed in this EG include, but are not limited to, those identified in the Reference section of this document.



POTENTIAL ENVIRONMENTAL RISKS

The following environmental concerns are associated with these activities:

- Uncontrolled releases
- Storm sewer overflow
- Contamination of surface water
- Aesthetics (trash, mowing)
- Plugging of outlet structures
- Illegal dumping & discharge
- Contamination of soil and/or groundwater
- Sediment & erosion control
- Flooding
- Odors
- Nuisance control (pests, odor)

Potential consequences from performing the activity incorrectly:

- Personal injury, property damage, or long-term damage to the environment
- Possible regulatory noncompliance, Notices of Violation, and related [financial & non-financial] penalties

RECOMMENDED OPERATING CONTROLS

Prohibited Activities

- Washing spills into the sewer system is prohibited.
- Discharges to State Waters without a permit.
- Discharge of the following materials down any drain is prohibited:
 - Any oils or grease
 - Pesticides, insecticides, or herbicides
 - Solvents
 - Solids of any kind, including soils
 - Generally prohibited discharges as specified by Metro Wastewater and Denver Wastewater rules and regulations
- Disposal/discharge of wastewater into any storm drain, inlet, etc. or waterway is prohibited.
- Transporting waste liquids and solids contained in equipment and originating from off-site onto DEN property is prohibited without prior approval from DEN Environmental Services (ES).
- Disposal of materials into the deicing waste (DIW) system (e.g., slot drains, ponds) without prior approval from DEN ES is prohibited.

General Considerations

Obtain all applicable federal, state, and local permits for construction projects.

- Either one or both the Colorado Stormwater Construction General permit and/or the Denver Construction Activities Stormwater Discharge Permit apply to construction sites meet one or more of the following criteria:



- Disturbing one acre or more, or less than one acre but part of a larger common plan of development,
 - Are part of a larger common plan of development is defined as a contiguous area where multiple separate and distinct construction activities may be taking place at various times on different schedules under one plan,
 - The site has been identified as having a significant potential for erosion, based on site characteristics including steep topography,
 - The site is not known to contain contaminated soils or pre-existing environmental impairment, and
 - The site is not directly adjacent to receiving waters (i.e., creek, stream, river, pond, lake, etc.).
- A dewatering permit may be required if construction activities require the removal and discharge of groundwater offsite.
 - A U.S. Army Corp of Engineers (USACE) Section 404 Permit may be needed if the work will be conducted in or impact waters of the United States, including wetlands, washes, drainages, ditches, creeks, streams, and rivers.
 - Applicable sediment and erosion controls shall be installed to prevent illegal discharges to the storm sewer or waterways, such as inlet protection, silt fence, sediment traps, erosion control logs, check dams, and vehicle tracking control. Sediment and erosion controls will be installed and maintained in accordance with approved design criteria and/or industry standards.
 - Protect storm drain inlets and drains with curb socks, rock berms, inlet protection, or drain covers/mats prior to any activity.
 - Sediment, debris, and litter removed from structures will be disposed of in accordance with regulatory requirements. Disposal of solid waste on DEN property is prohibited without prior DEN ES approval. Manage waste generated during maintenance activities in accordance with Environmental Guideline General Waste Management.
 - Where feasible, schedule maintenance activities during dry weather.
 - Stay alert for any signs of illicit discharges. This includes “dry weather” flows or pipes or hoses emptying directly into waterways or the storm sewer system.
 - Leaking material containers should be properly discarded and replaced.
 - Store materials in containers under cover when not in use and away from any storm drain inlet.
 - Keep impervious surfaces clean of debris and sediment to avoid transport of materials into the MS4.

Training Requirements

- Training will be conducted as necessary to conduct the Activity as described herein and to inform employees of impacts associated with illegal discharges and improper disposal of waste from municipal operations.
- Records of on-the-job training are not required. Records of formal employee training, if provided, shall be retained.

Storage and Materials Management

- Store materials per RCRA-approved methods.
- Maintain legible labels and markings on all containers and tanks.



- Ensure adequate secondary containment for all bulk storage containers, and that all containers and containment are in good operating condition.

EMERGENCY RESPONSE

- Call DEN Communications Center immediately at 303-342-4200 for all spills.
- If a spill occurs, refer to Environmental Guideline Spill Response.
- Control spills to minimize property damage and eliminate imminent risk to human health and the environment.
- Containerize all collected wastes and evaluate for labeling, storage, and disposal.

TENANT INSPECTION AND MAINTENANCE REQUIREMENTS

Private tenants are responsible for the maintenance of structural controls on or that service leased property pursuant to agreements signed with DEN. Tenants should periodically inspect structural controls and remove sediment, trash, and debris when observed.

DEN ES performs periodic inspections of tenant-operated structural controls. The Pond Inspection Checklist in the Veoci inspection database is used to document the DEN ES inspections; however, there is no required field documentation needed for the field inspection. The inspector makes visual observations and compiles a report summarizing these observations. If proper maintenance activities are not occurring as required, a report will be submitted to the DEN Properties Department for evaluation and compliance with applicable agreements signed with DEN.

TENANT EXPECTED RECORDS AND OUTPUTS

Tenants should utilize the “Pond Inspection Checklist” (provided at end of this EG) or similar document to record inspection and maintenance activities.

DEN INSPECTION AND MAINTENANCE REQUIREMENTS

Maintenance activities are initiated by FAA requirements, field observations made during normal daily activities, or based on the results of the DEN ES inspection. Depending on the level of maintenance required, DEN Field Maintenance or a contractor will provide maintenance activities for the municipally owned and operated MS4 system. These activities include but are not limited to, mowing operations to limit unwanted vegetation and to improve aesthetics, removal of debris and litter to minimize inlet/outlet clogging, repair and re-vegetation of eroded areas, and remove accumulated sediment near culverts, in channels, and pond bottoms to maintain flow capacity.

DEN ES performs an annual inspection of municipally owned and operated structural controls to identify issues and ensure that proper maintenance activities are occurring. The Pond Inspection Checklist in the Veoci inspection database is used to document the DEN ES inspections. The inspector makes visual observations and summarizes observations on the checklist. If maintenance is required a report will be



submitted to the Director of Field Maintenance for evaluation to determine the level of maintenance required.

Detention Facilities

A detention facility is a sedimentation basin designed to totally drain dry sometime, usually within 40 hours, after stormwater runoff ends. The ponds are considered “dry” because they are designed not to have a significant permanent pool of water remaining between storm runoff events. Therefore, standing, or pooling water during dry periods indicates maintenance may be required.

- Debris and litter removal will be conducted based on visual inspection.
- Mowing operations will be conducted as needed.
- Non-irrigated native grasses should be 4 to 6 inches tall.
- Erosion and sediment control issues will be addressed as necessary based on visual inspection.
- Sediment removal from the fore bay, micro-pool, and the pond bottom will take place based on visual inspection.
- Repair and revegetation of eroded areas of basins and channels will take place as needed.

Improved and Unimproved Drainage Ways and Storm Sewer System

Improved channels consist of engineered channels that are lined with riprap, concrete, or other materials that provide protection and / or improve flows. Unimproved channels are vegetated or un-vegetated drainage ways with low pitched side slopes that collect and slowly convey runoff. The Storm Sewer System includes inlets, catch basins, siphon sets, mainline pipe, and associated fittings. Standing or ponding water during dry periods is an indication that maintenance may be required.

- Improved channels require periodic maintenance including debris and sediment removal, patching, joint repair, riprap adjustment, and other such activities.
- Mowing operations will be conducted as needed.
- Debris, litter, and sediment removal will be conducted as needed based on visual inspection.
- Erosion and sediment control issues will be addressed as necessary based on visual inspection.
- Sediment in the channel should not reach a depth of 6 inches or impede the intended flow.

DEN EXPECTED RECORDS AND OUTPUTS

- MS4 related maintenance activities conducted by DEN Field Maintenance shall be recorded in the DEN Maximo system. Recorded information should include costs incurred and total hours for the activity. This information will be incorporated into the DEN MS4 Annual Summary submitted to DOTI annually.
- Results of the annual DEN ES inspection will be recorded on the Pond Inspection Checklist Form (Veoci inspection database) for incorporation into the DEN MS4 Annual Summary submitted to DOTI annually.

REFERENCES



Contacts

- DEN Communications Center (for spill reporting): 303-342-4200
- DEN Environmental Services (Main Line): 303-342-2730; DIA.Environmental@flydenver.com
- Krystina Spencer, DEN Environmental Services: 303-342-2391; Krystina.Spencer@flydenver.com

Guidance Materials

- SDSs
- DEN Stormwater Management Plan (SWMP)
- DOT Labeling and Placarding Guidance
- SPCC Plan
- Mile High Flood Control District's Urban Storm Drainage Criteria Manual Volume 3 – Best Management Practices

Related Environmental Guidelines

Note: The following list identifies procedures related to MS4 Operations and Maintenance Procedures but may not be all-inclusive. The following procedures are considered primary documents for purposes of compliance with the MS4 permit.

- Cleaning/Washing – Aircraft, Vehicles, and Equipment
- Storage of Vehicles and Equipment Containing Chemicals
- Cleaning/Washing – Indoor Industrial Surfaces
- Maintenance of Pretreatment Devices
- Construction
- Planning and Design
- Management of Pesticides and Herbicides
- Cleaning/Washing – Outdoor Areas and Structures
- Pavement Deicing
- Spill Response
- General Waste Management

Applicable Regulations

- 40 CFR 117.3 Determination of Reportable Quantities for a Hazardous Substance
- 40 CFR 122-124 NPDES Regulations for Storm Water Discharges
- 40 CFR 260-262-273 Federal RCRA Regulations
- 6 CCR 1007-3, Part 261 State RCRA Regulations
- CCD MS4 Permit
- CCD Ordinances
- Denver Wastewater Management Division Rules and Regulations
- Metro Wastewater Reclamation District Rules and Regulations
- DEN Rules and Regulations
- CCD Mayor's Executive Orders



Other Documents

- DEN Managers Bulletins



POND INSPECTION CHECKLIST

Pond Inspected (#):			Date Inspected:			
Inspector's Name:						
INSPECTED ITEM	OVERALL CONDITION (CIRCLE ONE)			MAINTENANCE NEEDED (YES/NO)		COMMENTS
SEDIMENT/DEBRIS/LITTER						
Sediment Deposits	Good	Fair	Poor	Yes	No	Depth (in):
Debris in Pond	Good	Fair	Poor	Yes	No	
Litter	Good	Fair	Poor	Yes	No	
VEGETATION						
Vegetative Cover	Good	Fair	Poor	Yes	No	
Seeding Required				Yes	No	Location: Approx Sq Ft:
Mowing Required				Yes	No	
OUTLET STRUCTURE						
Trash Rack	Good	Fair	Poor	Yes	No	
Orifice Plate	Good	Fair	Poor	Yes	No	
Outlet Structure	Good	Fair	Poor	Yes	No	
POND BOTTOM						
Concrete Trickle Channel (if present)	Good	Fair	Poor	Yes	No	
Side Slopes	Good	Fair	Poor	Yes	No	
Inflow Pipes	Good	Fair	Poor	Yes	No	
ADDITIONAL ITEMS						
MAINTENANCE REQUIRED						