



Stormwater Management Facility Routine Maintenance Manual District 5 – Glen Burnie Shop

Version 1.0





Stormwater and Drainage Asset Management Program

TABLE OF CONTENTS

<u>SECT</u>	<u>PAGE NO.</u>
I.	Introduction1
	How to Use This Manual1
II.	Glossary1
III.	Types of Stormwater Management Facilities
	SWM Facility Routine Maintenance Categories
	How to Identify Routine Maintenance Categories
IV.	Routine Maintenance of SWM Facilities
	Routine Maintenance Guidelines
V.	Identifying and Solving Common Problems6
	Erosion
	Sediment Accumulation
	Lack of Vegetation7
	Excessive Vegetation
	Damaged or Deteriorated Structure or Pipe
	Unstable Embankment
	Undesirable Ponding Water
VI.	Mapping and Index Description

APPENDICES

- **Routine Maintenance Guidelines** А.
- В. Stormwater Management Facility Mapping
 - B-1 Overview Map
 - Tile Maps B-2
 - B-3 Detail Maps
- Index of Stormwater Management Facilities С.

I. INTRODUCTION

The Maryland State Highway Administration (SHA) Highway Hydraulics Division (HHD) has established the Stormwater and Drainage Asset Management Program to guide the operation and remediation of the numerous permanent stormwater and drainage assets owned by SHA that convey and treat highway runoff. The program goal is to provide preventive care, and remedial solutions when problems are identified, for the stormwater and drainage infrastructure within the right-of-way. The program applies a life-cycle approach to its management of stormwater and drainage assets. Operations of these assets, especially routine maintenance, is a critical phase in this life-cycle. Routine maintenance is necessary to ensure that these assets function effectively, and to prevent the need for costly and time-consuming repairs and retrofits.



This Stormwater Management Facility Routine Maintenance Manual has been developed by HHD to aid and inform SHA maintenance personnel who work out of SHA maintenance shops to perform routine maintenance on stormwater and drainage assets. Of SHA's numerous assets, this manual specifically addresses the routine maintenance of stormwater management (SWM) facilities. SWM facilities are structural and non-structural practices designed to manage the volume, flow rate, and quality of stormwater runoff before that water enters natural waterways or groundwater. These SWM facilities play an important role in protecting Maryland's water and land resources.

This manual has been prepared specifically for the District 5 Glen Burnie Shop (Shop). The manual serves two main purposes:

- 1. To define the location and type of all SWM facilities in the Shop area, and
- 2. To provide guidelines on recommended routine maintenance activities for these SWM facilities.

The following narrative identifies and describes the routine maintenance categories of SHA SWM facilities, recommended guidelines for routine maintenance of these facilities, and solutions for commonly-occurring minor maintenance issues. Routine Maintenance Guidelines are included in Appendix A of this manual. A map of each SWM facility in the Shop area is provided in Appendix B, and an index summarizing all of the SWM facilities is provided in Appendix C.

How to Use This Manual

Follow these steps to determine the maintenance requirements of a particular SWM facility:

- Both the tile maps and detail maps identify the SWM facility number.

II. GLOSSARY

The following terms are used within this manual to describe the components of SHA stormwater management facilities and their associated routine maintenance activities. Portions of this glossary were adapted from the "2000 Maryland Stormwater Design Manual" produced by the Maryland Department of the Environment, Water Management Administration.

Aquatic Perimeter Planting – Vegetation generally living within 15 feet from the edge of the permanent pool in Wet Ponds. Aquatic perimeter planting is not mowed as part of SWM facility routine maintenance.

Basin – A land feature that holds water, with slopes on all sides. A basin may be constructed by excavating a pit in the ground or by constructing a dam or fill embankment.

Berm – A mound or bank of earth, compacted and stabilized on an uninterrupted continuous slope, that is used as a barrier for water.

Check Dam – A small dam (typically 6" to 12" in height) constructed across a bio-swale or other linear SWM facility that holds water in order to give it time to soak into the ground. A check dam may be constructed out of earth, timber or concrete.

Cleanout - A capped vertical pipe (typically 6" dia. PVC) that extends from the underdrain of a Filtration Facility to above the ground surface. Cleanouts are only present if the Filtration Facility has an underdrain.

1. Identify the SWM facility number. If the SWM facility number is unknown, use the overview map and tile maps in Appendix B to navigate to the SWM facility by its location.

2. Identify the SWM facility routine maintenance category. Using the Index of Stormwater Management Facilities in Appendix C, locate the identified SWM facility number in the table and read across the row to determine its routine maintenance category. Section III of this manual describes how SWM facilities are divided into routine maintenance categories.

3. Follow the Routine Maintenance Guidelines applicable to the identified category. Routine Maintenance Guidelines for SWM facilities can be found in Appendix A, along with sample schematics and photographs. Note that some routine maintenance categories, as described in Section III, either do not require routine maintenance by Shop maintenance personnel or should be maintained per SHA Turfgrass Management Guidelines.

The cleanout allows the underdrain to be accessed from the surface in order to clean the underdrain. From the surface, a cleanout may appear identical to an observation well – the two can only be distinguished by removing the cap and investigating belowground to determine if the vertical pipe is connected to an underdrain.

Concentrated Flow – Stormwater runoff that accumulates or converges into well-defined channels.

Dam - A barrier against the flow of water intended to: confine or raise water for storage or diversion; slow the speed of runoff; reduce erosion potential; and/or encourage sediment to settle out of water.

Dewatering Pipe – A small pipe running from the bottom of a forebay to the main treatment area of a SWM facility in order to allow water in the forebay to drain out.

Embankment – The side slope areas of SWM facilities. There are two main types of embankments: fill embankments and cut embankments. Fill embankments are created by placing fill material above existing ground to hold water in the facility. Some fill embankments contain a buried structural component to add stability and prevent seepage. Cut embankments are the side slopes of a facility that was created by excavating below existing ground.

End Structure – Any structure located at the end of a pipe where the pipe is open to a ditch, stream, or other natural land feature (i.e. where the pipe daylights). Examples of end structures include end walls and flared end sections.

Erosion – The process of water wearing away the soil surface.

Filter Bed – The section of a Filtration Facility below the ground that contains filter media and the underdrain pipe, if present.

Filter Media – Layers of sand, organic matter, soil, gravel and/or other media in a Filtration Facility used to remove pollutants and sediment from water soaking into the ground. The filter media cleans water before it reaches a stream or other natural body of water.

Filtration – The separation or removal of pollutants and sediment from stormwater runoff as water moves downward through filter media.

Footprint – The general area of land covered by a SWM facility.

Forebay – Storage space where runoff enters a SWM facility at an inflow point. The forebay traps incoming sediment before it can accumulate in the main treatment area of a SWM facility. It is often separated from the main treatment area by an earthen or stone weir. The forebay may be designed to be dry or may be designed to have a permanent pool of water. A dry forebay may include a dewatering pipe.

Herbaceous Vegetation – Plants that have non-woody stems which die down to the soil level at the end of the growing season; excludes trees and shrubs.

Infiltration – The downward movement of water into the ground.

Inflow/Outflow Protection – A device or material (usually riprap, gabions or a concrete structure) placed at inflow and outflow points and used to protect the soil surface from erosion caused by concentrated flows.

Inflow Point – Any place where a concentrated flow of water enters a SWM facility. Examples of inflow points include pipes, end structures, curb openings, and ditches.

Inlet – A structure at ground level with an opening that intercepts water and directs it into a pipe. An inlet is typically a concrete structure with a metal grate covering the opening. An inlet may also be called a catch basin.

Maintenance Access – A permanent entrance or access way into a SWM facility that is stabilized and graded to allow vehicular access.

Major Sediment Accumulation – Sediment that has accumulated in a large enough quantity that mechanical equipment must be used to remove it.

Minor Sediment Accumulation – Accumulated sediment that can be easily removed with a shovel.

Observation Well – A capped vertical pipe (typically 6" dia. PVC) that extends from the bottom of a Filtration Facility's filter bed or an Infiltration Facility's stone reservoir to above the ground surface. Observation wells are not connected to other pipes. By removing the cap and looking in the observation well, an inspector is able to measure the level of water below the ground at any given time. From the surface, an observation well may appear identical to a cleanout – the two can only be distinguished by removing the cap and investigating belowground to determine if the vertical pipe is connected to an underdrain.

Outfall – The place where water leaves a pipe or ditch carrying water away from a SWM facility; located outside of the SWM facility footprint and downstream of an outflow point. An outfall is typically a ditch or stream.

Outflow Point – Any structure or place where a concentrated flow of water leaves a SWM facility; located within the SWM facility footprint. Examples of outflow points include riser structures, inlets, pipes, and weirs.

Permanent Pool – An area within a SWM facility that is intentionally designed to permanently hold some volume of water at all times. Generally, any water that is *not* in a permanent pool is supposed to soak into the ground within 72 hours after a storm. After a storm it may be difficult to determine in the field whether standing water is intended to be a permanent pool, so maintenance personnel may need to reference design plans to identify permanent pools.

Pond Drain – A small pipe that runs from the bottom of a SWM facility to the bottom of a riser structure. A pond drain can be used to dewater a SWM facility. In Wet Ponds, this opening in the riser may be intentionally sealed or blocked to maintain the permanent pool. Pond drains may be outfitted with locks or valves where they connect to the riser structure.

Retrofit – Changes made to an existing SWM facility in order to improve the overall function. Retrofits generally involve more design and permitting than typical maintenance activities. SWM facilities that are intended to be retrofitted or are undergoing retrofit may be excluded from routine maintenance activities.

Riser Structure – A vertical corrugated metal pipe or concrete box structure which extends above the bottom of a SWM facility. The riser structure is the main outflow point that allows water to flow out of the facility.

Runoff – Water from rain, snow or other precipitation that does not soak into the ground, but instead flows over the land surface.

Sediment – Solid material, such as soil particles, that is carried by (and eventually settles out of) water.

Seepage – The process of water moving through or emerging from a fill embankment. Seepage is a sign that the embankment may potentially be failing. This problem may be indicated by wet soil on the outside of a fill embankment. Any signs of seepage should be reported to HHD.

Stone Reservoir – The section of an Infiltration Facility below the ground that is filled with stone. The stone reservoir serves as short-term storage-space for water that has soaked into the facility, in order to hold that water until it can infiltrate into the ground below the stone reservoir.

Stormwater Management (SWM) Facility – A structural or non-structural practice designed to manage the volume, flow rate, and quality of stormwater runoff before that water enters natural waterways or groundwater. SWM facilities may be located belowground or at the land surface.

SWM Facility Number – A unique identification number assigned to a SWM facility by HHD for the purpose of tracking activities and functions associated with that facility.

Toe (of Embankment) - Typically where the embankment slope stops, levels out, or meets existing grade; generally the bottom of the slope. It may be difficult to determine in the field where the outer toe of a fill embankment is if the SWM facility is located on a slope, so maintenance personnel may need to reference design plans in order to determine this location.

Trash Rack – A metal grill, grate, or other device installed at the point where water flows into a riser structure, meant to prevent oversized debris from entering the structure.

Underdrain – A horizontal perforated or slotted pipe that lies at the bottom of a filter bed in a Filtration Facility. Most Filtration Facilities have underdrains. The underdrain allows water that has soaked all the way through the filter bed to flow to the outfall.

Weir – A barrier that holds ponded water until the water depth reaches the height of the barrier, at which point water then flows over the weir. Examples of weirs include a barrier between the forebay and the main treatment area of a SWM facility (resembling a small dam), a low point in the top of an embankment through which excess water flows away from the facility, or a wall that limits or controls the flow of water into a riser structure.

III. TYPES OF STORMWATER MANAGEMENT FACLITIES

As of 2015, the State Highway Administration (SHA) owns and maintains more than 3,600 permanent stormwater management (SWM) facilities throughout the state of Maryland, and this number is increasing each year. The Glen Burnie Shop (Shop) area contains over 250 SWM facilities, all of which must be routinely maintained in order to preserve their ability to perform effectively. These SWM facilities play an important role in managing both the quantity and quality of stormwater runoff entering Maryland's waterways. Title 4, Subtitle 2 of the Environment Article of the Annotated Code of Maryland states that "...the management of stormwater runoff is necessary to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding, all of which have adverse impacts on the water and land resources of Maryland."

As part of the Stormwater and Drainage Asset Management program, HHD has developed a geodatabase inventory that identifies all SHA infrastructure that captures, treats, and conveys stormwater runoff within SHA right-of-way. This geodatabase defines the location, facility number, and type of all SWM facilities owned by SHA in the state of Maryland. There are 46 different types of SWM facilities in the HHD geodatabase, all varying widely in design and function. Some SWM facilities are ponds, traditionally designed according to older guidelines. Many of the newer facilities are smaller in footprint, but greater in number, and are designed according to Environmental Site Design (ESD) guidelines. These newer ESD facility types are indicated below with "(ESD)".

SWM Facility Routine Maintenance Categories

There are three defining characteristics of SWM facilities relating to routine maintenance requirements: (1) how the SWM facilities function, (2) how they appear at the land surface, and (3) how they should be maintained. Based on these three characteristics, the 46 SHA SWM facility types have each been classified into one of seven routine maintenance categories. This manual provides routine maintenance guidelines for five of the seven categories (Categories 1-5). Routine maintenance of SWM facilities in the other two categories (Categories 6-7) is either not the responsibility of Shop maintenance personnel or is guided by SHA Turfgrass Management Guidelines. The routine maintenance categories are as follows:

- to settle out of water, and to manage the volume of stormwater runoff in order to prevent floods. A Dry Pond generally appears to be a grass basin. It is not designed have a permanent pool of water, and therefore should not have standing water during dry weather conditions. Dry Ponds should be maintained by following the Dry Pond Routine Maintenance Guidelines in Appendix A. The category of Dry Pond includes the following SWM facility types:
 - Dry Pond
 - Dry Extended Detention Pond

1. Dry Pond – A Dry Pond is a SWM facility that is designed to hold stormwater runoff, then release the runoff over a period of time. The purpose of a Dry Pond is to allow time for pollutants and sediment



- 2. Wet Pond Similar to a Dry Pond, a Wet Pond is a SWM facility that is designed to hold stormwater runoff, then release the runoff over a period of time, with the purpose of removing pollutants and sediment from water and providing flood protection. Unlike a Dry Pond, however, a Wet Pond is designed to permanently hold some volume of water at all times. A Wet Pond generally includes a grassed embankment and aquatic perimeter planting around a pool of water. Wet Ponds should be maintained by following the Wet Pond Routine Maintenance Guidelines in Appendix A. The category of Wet Pond includes the following SWM facility types:
 - Wet Pond
 - Shallow Marsh
 - Wet Extended Detention Pond
 - Micropool Extended Detention Pond
 - Wet Swale (*ESD*)
 - Pocket Pond
 - ED Shallow Wetland
 - Pond/Wetland System
 - Pocket Wetland
 - P-4 (Multiple Pond System)
 - W-1 (Shallow Wetland)



Example Wet Pond

Note that wetland SWM facility types in this category are not considered jurisdictional wetlands or natural resources protected by the Maryland Department of the Environment (MDE). Wetland SWM facility types may be accessed and maintained without an MDE permit.

3. Infiltration Facility – An Infiltration Facility is a SWM facility that is designed to temporarily hold stormwater runoff while allowing the water to soak into the ground over time. The purpose of an Infiltration Facility is to reduce the amount of stormwater runoff flowing on top of the land surface by

redirecting that water into the ground. An Infiltration Facility may be in the form of a basin or a ditch. It may have a stone or grass bottom, and typically includes an observation well. Infiltration Facilities may also have stone reservoirs belowground. Infiltration Facilities should be maintained by following the Infiltration Facility Routine Maintenance Guidelines in Appendix A. The category of Infiltration Facility includes the following SWM facility types:

- Infiltration Trench
- Infiltration Basin
- Dry Well (ESD)



Example Infiltration Facility

- Appendix A. The category of Filtration Facility includes the following SWM facility types:
 - Micro-Bioretention (ESD)
 - Bioretention
 - Surface Sand Filter
 - Submerged Gravel Wetland (ESD)
 - Rain Garden (ESD)
 - Landscape Infiltration (ESD)
 - Organic Filter
 - Enhanced Filter (ESD)
- water soaks through the filter media. Note that Bio-swales are identified as a separate category from the Filtration Facility category because they make up a relatively large percentage of SHA SWM facilities. Bio-swales should be maintained by following the Bio-swale Routine Maintenance Guidelines in Appendix A. Dry swales are functionally and physically very similar to bio-swales and can be maintained the same way. The category of Bio-swale includes the following SWM facility types:
 - Bio-swale (ESD)
 - Dry Swale

4. Filtration Facility - A Filtration Facility is a SWM facility that is designed to temporarily hold stormwater runoff above a filter bed. Over time, the water soaks through the filter media, which removes pollutants and sediment from the water. A Filtration Facility often includes an underdrain and cleanout(s) extending above the surface of the ground. The facility may be fully vegetated, or have only mulch on the bottom, or be landscaped with both vegetation and mulch. Filtration Facilities should be maintained by following the Filtration Facility Routine Maintenance Guidelines in



5. Bio-swale – A Bio-swale is a specific type of Filtration Facility that is located in a ditch with a 2 to 8 foot wide flat bottom. Like a Filtration Facility, the purpose of a Bio-swale is to remove pollutants from stormwater runoff. A Bio-swale generally includes check dams spaced evenly along the length of the facility. The check dams are intended to create ponding of water for a period of time while the



6. **Turfgrass Maintenance** – Some SWM facilities do not have visible features that distinguish them from other grassed areas that SHA maintenance personnel routinely mow and maintain. SHA maintenance personnel *are* responsible for the routine maintenance of these simple turfgrass SWM

facilities. However, guidelines for such routine maintenance are not provided in this manual. Instead, follow SHA Turfgrass Management Guidelines to maintain the following facility types:

- Grass Swale (ESD)
- Grass Channel Credit
- Disconnection of Non-Rooftop Runoff (ESD)
- Infiltration Berm (*ESD*)
- Sheetflow to Conservation Areas (ESD)

Example Turfgrass SWM Facility

- 7. No Routine Maintenance Although the following SWM facility types may be mapped and included in the Index in this manual, SHA maintenance personnel are *not* responsible for their routine maintenance unless otherwise directed by HHD:
 - Underground Detention
 - Underground Sand Filter
 - Permeable Pavement (ESD)
 - Porous Pavement
 - Rainwater Harvesting (ESD)
 - Oil Grit Separator
 - Stream Restoration
 - Other

How to Identify Routine Maintenance Categories

The routine maintenance category that any SWM facility falls into can be identified as follows:

Option A: Given a known SWM facility number, the SWM facility type and routine maintenance category can be read from the Index of Stormwater Management Facilities in Appendix C.

Option B: Read the SWM facility type at the top right corner of a detail map in Appendix B. Then return to this section (pages 3 through 5) to determine which routine maintenance category the identified SWM facility type is listed under.

IV. ROUTINE MAINTENANCE OF SWM FACILITIES

There are four levels of stormwater management (SWM) facility maintenance: (1) routine, (2) minor, (3) major, and (4) retrofit. Effective routine maintenance of SWM facilities will typically ensure good function and pleasing aesthetics of the facilities, and can be essential in the minimization of minor and major maintenance needs over time. Failure of SWM facilities to perform as designed can negatively affect both SHA SWM permit compliance and achievement of Chesapeake Bay TMDL goals.

The SHA maintenance shops are generally responsible for routine maintenance of SWM facilities, and for repair or correction of any minor issues that occur. HHD is committed to providing the shops with support in these operational activities. When performing routine and minor maintenance activities, contact HHD if any questions or concerns are raised regarding SWM facilities or other stormwater and drainage assets.

Major maintenance issues and SWM facility retrofits are the responsibility of HHD. Consequently, any SWM facilities that are in need of major maintenance or are designated as retrofit facilities will not be the responsibility of the SHA shops while the repair or retrofit implementation is occurring. HHD will annually provide a list to the **Glen Burnie Shop** (Shop) that clearly identifies all SHA SWM facilities in the Shop area, along with who is responsible for their maintenance. Note that the mapping provided in Appendix B may include SWM facilities that do not need to be routinely maintained by the Shop. Therefore, in order to effectively plan routine and minor maintenance to be completed by the Shop, this mapping should be used in conjunction with the annual list of facilities and personnel responsible for maintenance.

Routine Maintenance Guidelines

Routine Maintenance Guidelines for five SWM facility routine maintenance categories are provided in Appendix A of this manual. Each set of guidelines is accompanied by a sample schematic of a SWM facility type associated with that category, along with sample photographs of such facilities. For all five of these SWM facility routine maintenance categories, it is recommended that that routine maintenance of a facility be performed at least twice a year: once in the spring between March 15th and May 15th and once in the fall between September 15th and November 15th.

In order to simplify the routine maintenance requirements for maintenance personnel, mowing guidelines have been standardized for the five SWM facility routine maintenance categories (Categories 1-5). Herbaceous SWM facility vegetation, excluding aquatic perimeter planting, should be mowed to a height of 6-inches once each year in the fall. Facilities should be mowed using an articulated or side arm mower. Boom-axe, flail or rotary heads should be attached for proper mowing based on the type of vegetation being cut. Equivalent equipment, as available to the maintenance crew for safe mowing procedures, is acceptable.

In general, SWM facilities should be mowed according to the guidelines presented in this manual within the limits of 15 feet beyond the top of a cut embankment; 15 feet beyond the outer toe of a fill embankment; or the ditch bottom for a linear SWM facility located in a ditch. Refer to the SWM Facility Limits of Mowing in Appendix A for profiles of these mowing limits. Note that mowing according to this manual's

- Other Pond
- Other Wetland
- Other Infiltration
- Other Filtering
- Other Open Channel System
- X-2
- Y-1

guidelines may be in addition to mowing according to other guidelines. For example, a Bio-swale should be mowed according to the Bio-Swale Routine Maintenance Guidelines within the limits of the flat ditch bottom, and should generally also be mowed according to SHA Turfgrass Management Guidelines outside of those limits along the ditch side slopes.

Other routine maintenance activities that should be performed each year include removing trash and debris, stabilizing eroded areas, and re-seeding sparsely vegetated areas. While performing this routine maintenance, maintenance personnel should also inspect the SWM facility to identify potential issues that may require minor or major maintenance. Check for deterioration or damage to any structures associated with the facility; soft spots, depressions, water seepage or any other signs of potential structural failure in the embankment; and/or a build-up of sediment. Identification of and responses to such issues are further explained in Section V of this manual.

Of the five SWM facility routine maintenance categories for which guidelines are provided in this manual, only Wet Ponds should have a permanent pool of water during dry weather conditions. Any SWM facility classified as one of the other four maintenance categories is not functioning properly if water remains in the facility more than 72 hours after a storm. Actions that maintenance personnel can perform to solve the issue of undesirable ponding water include clearing clogs or obstructions to outflow points, removing accumulated sediment and debris, and cleaning out the underdrain, if present. See Page 9 for further information. Regardless of whether the undesirable ponding water issue is solved, report any actions taken to remediate the issue and the results to HHD.

In order to function properly, Filtration and Infiltration Facilities depend on the infiltration of water into and through soil layers at specific rates, per the design of the SWM facility. When soil and/or filter media become compacted, the rate of infiltration through the media is reduced. Therefore, it is important to perform all maintenance activities on Filtration and Infiltration facilities (including Bio-swales) in a manner that prevents compaction of the facility bottom. Do not drive equipment over the bottoms of Infiltration facilities, Filtration facilities, or Bio-swales at any time. If compacted soil is ever observed in a Filtration or Infiltration facility, report the condition to HHD.

Do not perform maintenance on any portions of a SWM facility that contain saturated or wet soil at the surface. If saturated soils are observed, the routine maintenance activities for the affected areas should be rescheduled to occur when drier conditions are present, during the same season, if possible.

V. IDENTIFYING AND SOLVING COMMON PROBLEMS

While major issues with SWM facilities are the responsibility of, and should be reported to HHD, minor issues are typically handled by Shop maintenance personnel. The following pages define common issues that may be observed at SWM facilities, along with their solutions. Portions of this Section V were adapted from Chapter 7, "Best Management Practice Assessment Guidelines for Maintenance and Remediation," of the "Stormwater NPDES Program Standard Procedures Manual" produced by SHA.

Erosion

A common problem that occurs at many SWM facilities is erosion, often along an unstable ditch or embankment slope. When soils are not properly compacted during construction, or when vegetation does not establish properly along a slope or channel, erosion can occur. It is important to repair minor erosion immediately because bare soil that is exposed by erosion becomes even more susceptible to additional erosion, and thus minor erosion can quickly become a major problem.

Problem	Solution
	Fill the ero
	restore the
Minor erosion	to existing
	Else, re-see
	and install
Major erosion	Report to H



oded area with Furnished Topsoil as necessary to original ground surface. If the eroded area is adjacent riprap, stabilize the repaired area with Class I Riprap. ed the repaired area with SHA Turfgrass Seed Mix Type 'A' Soil Stabilization Matting. HHD.

Sediment Accumulation

Sediment is carried into SWM facilities with stormwater runoff, and as the water is held in the facility the sediment settles out of the water. Many SWM facilities have forebays to allow most of the sediment to settle out before the water reaches the main treatment area. Sediment can also accumulate in a SWM facility as a result of erosion upstream of the facility. Sediment accumulation in the main treatment area is a problem because it can slow infiltration of water into the ground, reduce the volume of water that can be stored in the facility, and/or clog outflow points. If identified, maintenance personnel should remove minor accumulated sediment from forebays, outfalls and other areas.

Problem	Solution
	Remove minor accumulated sediment with a shovel. If
Minor sediment accumulation	necessary, re-seed the affected area with SHA Turfgrass Seed
	Mix and install Type 'A' Soil Stabilization Matting.
Major sediment accumulation	Report to HHD.



Lack of vegetation is most commonly identified by areas of visible bare soil, and is a problem because it bare soil is vulnerable to erosion. While small areas of bare soil are not uncommon in the life-cycle of a SWM facility, large areas of bare soil may indicate that permanent or reoccurring conditions are not favorable for plant growth. In such cases, the condition should be reported to HHD so that HHD can assess the facility and determine whether there is an underlying issue causing the lack of vegetation.

Problem	Solution
Small area of bare soil	Re-seed the
Sinali area of bare son	Type 'A' S
Large area of bare soil	Report to H



Major Sediment Accumulation at Outfall

Major Sediment Accumulation in Forebay





he bare area with SHA Turfgrass Seed Mix and install Soil Stabilization Matting. HHD.

Excessive Vegetation

The growth of excessive vegetation over time can adversely impact a SWM facility by blocking pipes, structures, and weirs or by growing into and interfering with the proper function of filter media. Excessive vegetation can also interfere with an inspector's ability to perform required periodic inspections of facilities and structures. In most cases, vegetation should be controlled by routine mowing of SWM facilities. However, if excessive vegetation is encountered it should be removed.

Problem	Solution
Excessive vegetation	Clear the vegetation with a weed trimmer.

Damaged or Deteriorated Structure or Pipe

Structures and pipes in SWM facilities are occasionally damaged by large debris, ice, soil settlement, or other conditions. These critical components of SWM facilities also deteriorate over time. It is important to maintain structures and pipes in good condition to ensure that water is collected and conveyed to the intended location. If maintenance personnel encounter a damaged or deteriorated structure or pipe, inform the Shop Resident Maintenance Engineer to determine how to repair the structure or pipe.

Problem	Solution
Damaged or deteriorated structure	Report to I
or pipe	Report to I



Resident Maintenance Engineer.

Unstable Embankment

The embankment of a SWM facility holds water in the facility. Failure of an embankment results in water leaving the facility in problematic ways and locations, and is an indication that the facility cannot manage stormwater runoff as intended. Unmanaged runoff can lead to downstream flooding. It is therefore important to identify signs of potential embankment failure, including soft spots or depressions in the embankment, as well as seepage of water through a fill embankment. Erosion and holes, such as animal burrows, could also contribute to embankment failure.

Problem	Solution
Animal burrows or other holes	Eliminate holes by filling them with soil.
Erosion	See Identifying and Solving Erosion on page 6.
Soft spots, depressions, seepage, or other problem.	Report to HHD.



Undesirable Ponding Water

For all routine maintenance categories except Wet Ponds, no ponding water should be visible in the facility 72 hours after a storm. Only a Wet Pond should have a permanent pool of water during dry weather conditions. Undesirable ponding water may indicate that outflow point(s) are clogged; accumulated sediment/debris or clogged/compacted filter media is reducing the rate of infiltration; or the underdrain of a Filtration Facility is blocked. Regardless of whether the issue of undesirable ponding water is solved, report the actions taken to remediate the issue and the results to HHD.

Problem	Solution
Outflow point(s) are clogged	Clear clogs
Leaves/sediment/debris has	Remove m
accumulated on the facility bottom	the facility
Underdrain is blocked	Clean out t
Filter media is clogged or	Report to H
compacted, or other problem.	





gs in or obstructions to the outflow point(s). ninor leaf/sediment/debris buildup from the bottom of y. Report major buildup to HHD. the underdrain with a vacuum truck.

HHD.

VI. MAPPING AND INDEX DESCRIPTION

To effectively maintain all of the SWM facilities in the Glen Burnie Shop (Shop) area, Shop personnel must know the location and type of each facility. HHD has therefore developed maps of each of the existing SHA-owned SWM facilities in the Shop area, specifying the locations and types of the facilities. These maps are contained in Appendix B of this manual, and were prepared utilizing April 2015 geodatabase data. There are three types of maps provided:

- 1. An overview map of the entire Shop area, defining the limits of the Shop area within a reference grid.
- 2. Tile maps corresponding to the reference grid on the overview map, showing portions of the Shop area in greater detail. These tile maps show the general locations of the SWM facilities. Each SWM facility is labeled with a unique identification number.
- 3. One detail map for each SWM facility in the Shop area, defining the specific location and type of the facility, as well as the approximate layout of the facility.

The following information and features are displayed on the detail maps:

- The SWM facility number.
- The SWM facility type, corresponding to the facility types listed in Section III of this manual.
- The approximate facility footprint. A diamond or circle may be shown if the actual facility footprint was not available in the HHD geodatabase.
- SHA-owned pipes and drainage structures in the vicinity of the SWM facility, as defined in the HHD geodatabase. Structure numbers and pipe sizes and materials are labeled, if the information was available in the HHD geodatabase. Pipes are labeled as "UNK" if the pipe size and material was not available.
- The approximate SHA Right-of-Way line. This line is approximate and does not define ownership.
- Mile points along SHA-owned roads.
- Names of roadways in the immediate vicinity of the SWM facility, for location reference.
- The Shop boundary, if applicable.

Note that some detail maps show multiple SWM facilities, for cases where facilities are in close proximity to each other. In such cases, the SWM facility corresponding to the facility number and type written in the top right corner of the sheet is shown with a blue outline and red label, while other nearby facilities are shown with a yellow outline and gray label.

The locations and types of all of the SWM facilities in the Shop area have been summarized in the Index of Stormwater Management Facilities, found in Appendix C. This Index lists the SWM facility number, facility type, and routine maintenance category of all of the SWM facilities mapped in Appendix B, along with the number of the tile map that the SWM facility can be found on. This Index is presented in two forms: one sorted by SWM facility number, and one sorted by tile map.

This manual is a living document. Please provide comments and feedback to Kiona A. Leah at 410-545-8044 or at kleah@sha.state.md.us.

APPENDIX A

Routine Maintenance Guidelines



SWM Facility Limits of Mowing



NOTES: 1. SOME SWM FACILITIES MAY BE A COMBINATION OF CUT AND FILL EMBANKMENTS.

2. "SWM FACILITY LIMITS OF MOWING" ARE LIMITS OF MOWING ACCORDING TO GUIDELINES PRESENTED IN THIS STORMWATER MANAGEMENT FACILITY ROUTINE MAINTENANCE MANUAL. THERE MAY BE ADDITIONAL MOWING OUTSIDE OF THESE LIMITS ACCORDING TO OTHER GUIDELINES, SUCH AS SHA TURFGRASS MANAGEMENT GUIDELINES, WHERE APPLICABLE.

Dry Pond Routine Maintenance Guidelines

Maintaining Dry Ponds

		ructural maintenance of Dry Ponds.	
Scheduling: Once ea	ich sprin	g (March 15 – May 15) and fall (September 15 – Noven	nber 15).
Team:			Equip./
Facility Maintenance Technician IV	1	Spring Maintenance Work Method:	Materia
Facility Maintenance Technician	3	1. Install MOT devices.	(A)
		2. Remove trash, leaves, and debris from the	(B, C)
Equipment:		pond, trash rack, and other structure(s).	
MOT/Safety Equipment	А	3. Check for deterioration or damage to	
Pick-Up Truck	В	structure(s). Notify Resident Maintenance	
Shovel	С	Engineer if repair work is needed.	
Weed Trimmer	D	4. Check for clogs and clear vegetation	(D)
Articulated or Side Arm Mower	Е	obstructing the structure(s).	
Spreader	F	5. Remove accumulated sediment from the	(B, C)
Material:		facility.	(C, C)
	C	6. Check each side of the embankment, if	(C, G)
Furnished Topsoil SHA Turfgrass Seed Mix	G H	present. Eliminate any animal burrows/holes	
0		by filling them with soil. Report any soft	
Type 'A' Soil Stabilization Matting	1	spots, depressions, or water seepage to	
Class I Riprap	J	HHD.	(D)
		7. Haul removed trash, debris, vegetation, and	(B)
Unit of Measure:		sediment to designated disposal area.	
Each Dry Pond		8. Remove MOT devices.	
Payment:		Fall Maintenance Work Method:	
Maintaining Dry Ponds should be		1. Install MOT devices.	(A)
charged to Activity [TBD], with the		2. Remove trash, leaves, and debris from the	(B, C)
approval of the Office of Highway		pond, trash rack, and other structure(s).	
Design – Highway Hydraulics Divisior	1	3. Mow herbaceous vegetation within the	(D, E)
(HHD). When inspecting/supporting		SWM facility limits of mowing to a height of	
the work of contractors, the Agency		6-inches.	
Code [TBD] should also be used.		4. Seed sparsely vegetated areas and install	(F, H, I)
Number		matting.	
Notes:		5. Fill eroded areas with topsoil as necessary to	(C, F, G,
Follow guidelines for recommended	_	restore the original ground. Stabilize eroded	H, I, J)
personal protective equipment. Place	5	areas adjacent to existing riprap with riprap.	
signs and other safety devices in		Else, seed and install matting.	(D)
accordance with MUTCD and WZTC.		6. Haul removed trash, leaves, and debris to	(B)
De net nerferm meintenenes en		designated disposal area.	
Do not perform maintenance on		7. Remove MOT devices.	
portions of the facility with saturated	1	Tranklashasting	
soil.		Troubleshooting:	
		If water is still ponding in the facility 72 hours after	
		a storm, determine the cause and resolve in the	
		following order:	
		1. Check for clogs and clear any obstructions to	
		the outflow point(s).	
		2. Report to HHD.	





SAMPLE DRY POND SCHEMATIC

SAMPLE DRY POND PHOTOS

Wet Pond Routine Maintenance Guidelines

Maintaining Wet Ponds

			nber 15).
Team:			Equip./
Facility Maintenance Technician IV	1	Spring Maintenance Work Method:	Material
Facility Maintenance Technician	3	1. Install MOT devices.	(A)
		2. Remove trash, leaves, and debris from the	(B, C)
Equipment:		pond, trash rack, and other structure(s).	
MOT/Safety Equipment	А	3. Check for deterioration or damage to	
Pick-Up Truck	В	structure(s). Notify Resident Maintenance	
Shovel	С	Engineer if repair work is needed.	
Weed Trimmer	D	4. Check for clogs and clear vegetation	(D)
Articulated or Side Arm Mower	E	obstructing the structure(s).	
Spreader	F	Remove accumulated sediment from the facility.	(B, C)
Material:		6. Check each side of the embankment, if	(C, G)
Furnished Topsoil	G	present. Eliminate any animal burrows/holes	
SHA Turfgrass Seed Mix	Н	by filling them with soil. Report any soft	
Type 'A' Soil Stabilization Matting	I	spots, depressions, or water seepage to	
Class I Riprap	J	HHD.	
		7. Haul removed trash, debris, vegetation, and	(B)
Unit of Measure:		sediment to designated disposal area.	
Each Wet Pond		8. Remove MOT devices.	
Payment:		Fall Maintenance Work Method:	
Maintaining Wet Ponds should be		1. Install MOT devices.	(A)
charged to Activity [TBD], with the		2. Remove trash, leaves, and debris from the	(B, C)
approval of the Office of Highway		pond, trash rack, and other structure(s).	
Design – Highway Hydraulics Division		3. Mow herbaceous vegetation within the	(D, E)
(HHD). When inspecting/supporting		SWM facility limits of mowing to a height of	
the work of contractors, the Agency		6-inches.	(=)
Code [TBD] should also be used.		4. Seed sparsely vegetated areas and install	(F, H, I)
Neter		matting.	
Notes: Follow guidelines for recommended		5. Fill eroded areas with topsoil as necessary to	(C, F, G,
		restore the original ground. Stabilize eroded	H, I, J)
personal protective equipment. Place signs and other safety devices in		areas adjacent to existing riprap with riprap.	
accordance with MUTCD and WZTC.		Else, seed and install matting.	(D)
		 Haul removed trash, leaves, and debris to designated disposal area. 	(B)
Do not perform maintenance on		7. Remove MOT devices.	
portions of the facility with saturated			
soil.		Troubleshooting:	
		If the Wet Pond is dry and has no standing water,	
		determine the cause and resolve in the following	
		order:	
		1. Check that the pond drain opening in the	
		riser is completely sealed.	
		2. Report to HHD.	





SAMPLE WET POND SCHEMATIC

SAMPLE WET POND PHOTOS

Infiltration Facility Routine Maintenance Guidelines

Maintaining Infiltration Facilities

Description and Purpose: Aesthetic	and st	ructural maintenance of Infiltration Facilities.	
Scheduling: Once each	n sprin	g (March 15 – May 15) and fall (September 15 – Novem	nber 15).
Team: Facility Maintenance Technician IV	1	Spring Maintenance Work Method:	Equip./ Materia
Facility Maintenance Technician	3	1. Install MOT devices.	(A)
		2. Remove trash, leaves, and debris from the	(B, C)
Equipment:		facility and associated structure(s).	
MOT/Safety Equipment	А	3. Replenish stone, if necessary.	(G)
Pick-Up Truck	В	Check for deterioration or damage to	
Shovel	С	structure(s). Notify Resident Maintenance	
Weed Trimmer	D	Engineer if repair work is needed.	
Articulated or Side Arm Mower	Е	5. Check for clogs and clear vegetation	(D)
Spreader	F	obstructing the structure(s).	
		6. Replace any broken/missing observation	(H)
Material:		well caps.	
No. 2 Stone or Class 0 Riprap	G	7. Remove accumulated sediment from the	(B, C)
Screw Caps Sizes 4 and 6	Н	facility.	
Furnished Topsoil	I	8. Check each side of the embankment, if	(C, I)
SHA Turfgrass Seed Mix	J	present. Eliminate any animal burrows/holes	
Type 'A' Soil Stabilization Matting	К	by filling them with soil. Report any soft	
Class I Riprap	L	spots, depressions, or water seepage to	
		HHD.	
Unit of Measure:		9. Haul removed trash, debris, vegetation, and	(B)
Each Infiltration Facility		sediment to designated disposal area.	
		10. Remove MOT devices.	
Payment:			
Maintaining Infiltration Facilities		Fall Maintenance Work Method:	
should be charged to Activity [TBD],		1. Install MOT devices.	(A)
with the approval of the Office of		2. Remove trash, leaves, and debris from the	(B, C)
Highway Design – Highway		facility and associated structure(s).	
Hydraulics Division (HHD). When		3. Mow herbaceous vegetation within the	(D, E)
inspecting/supporting the work of		SWM facility limits of mowing to a height of	
contractors, the Agency Code [TBD]		6-inches.	
should also be used.		4. Seed sparsely vegetated areas and install	(F, J, K)
		matting.	
Notes:		5. Fill eroded areas with topsoil as necessary to	(C, F, I,
Follow guidelines for recommended		restore the original ground. Stabilize eroded	J, K, L)
personal protective equipment. Place		areas adjacent to existing riprap with riprap.	
signs and other safety devices in		Else, seed and install matting.	
accordance with MUTCD and WZTC.		6. Haul removed trash, leaves, and debris to	(B)
		designated disposal area.	
Perform all maintenance activities in		7. Remove MOT devices.	
a manner to prevent compaction of			
the facility bottom. Do not drive on		Troubleshooting:	
the facility bottom. Report observed		If water is still ponding in the facility 72 hours after	
compaction to HHD.		a storm, determine the cause and resolve in the	
		following order:	
Do not perform maintenance on		1. Check for clogs and clear any obstructions to	
portions of the facility with saturated		the outflow point(s).	
soil.		2. Remove leaf/sediment/debris buildup from	(B, C)
		the bottom of the facility.	
		3. Report to HHD.	







SAMPLE INFILTRATION FACILITY SCHEMATIC

SAMPLE INFILTRATION FACILITY PHOTOS



Filtration Facility Routine Maintenance Guidelines

Maintaining Filtration Facilities

Description and Purpose: Aesthetic	and st	ructural maintenance of Filtration Facilities.	
Scheduling: Once eacl	n sprin	g (March 15 – May 15) and fall (September 15 – Noven	nber 15).
Team: Facility Maintenance Technician IV	1	Spring Maintenance Work Method:	Equip./ Material
Facility Maintenance Technician	3	1. Install MOT devices.	(A)
,		2. Remove trash, leaves, and debris from the	(B, C)
Equipment:		facility and associated structure(s).	(-, -,
MOT/Safety Equipment	А	3. Replenish mulch, if present.	(C, H)
Pick-Up Truck	В	4. Check for deterioration or damage to	(0) 11)
Shovel	C	structure(s). Notify Resident Maintenance	
Weed Trimmer	D	Engineer if repair work is needed.	
Articulated or Side Arm Mower	E	5. Check for clogs and clear vegetation	(D)
Spreader	F	obstructing the structure(s).	(0)
Vacuum Truck	г G		(1)
	G	6. Replace any broken/missing cleanout caps.	(I) (D. C)
		7. Remove accumulated sediment from the	(B, C)
Material:		facility.	
Shredded Hardwood Mulch	H	8. Check each side of the embankment, if	(C, J)
Screw Caps Sizes 4 and 6	1	present. Eliminate any animal burrows/holes	
Furnished Topsoil	J	by filling them with soil. Report any soft	
SHA Turfgrass Seed Mix	К	spots, depressions, or water seepage to	
Type 'A' Soil Stabilization Matting	L	HHD.	
Class I Riprap	Μ	9. Haul removed trash, debris, vegetation, and	(B)
		sediment to designated disposal area.	
Unit of Measure:		10. Remove MOT devices.	
Each Filtration Facility			
		Fall Maintenance Work Method:	
Payment:		1. Install MOT devices.	(A)
Maintaining Filtration Facilities		2. Remove trash, leaves, and debris from the	(B, C)
should be charged to Activity [TBD],		facility and associated structure(s).	())
with the approval of the Office of		3. Mow herbaceous vegetation within the	(D, E)
Highway Design – Highway		SWM facility limits of mowing to a height of	(=)=)
Hydraulics Division (HHD). When		6-inches.	
inspecting/supporting the work of		4. Seed sparsely vegetated areas and install	(F, K, L)
contractors, the Agency Code [TBD]		matting.	(1, 1, 1, 1)
should also be used.		_	
אווטעוע מוצט אב עצבע.		5. Fill eroded areas with topsoil as necessary to	(C, F, J,
Notoci		restore the original ground. Stabilize eroded	K, L, M)
Notes:		areas adjacent to existing riprap with riprap.	
Follow guidelines for recommended		Else, seed and install matting.	
personal protective equipment. Place		6. Haul removed trash, leaves, and debris to	(B)
signs and other safety devices in		designated disposal area.	
accordance with MUTCD and WZTC.		7. Remove MOT devices.	
Perform all maintenance activities in		Troubleshooting:	
a manner to prevent compaction of		If water is still ponding in the facility 72 hours after	
the filter bed. Do not drive on the		a storm, determine the cause and resolve in the	
filter bed. Report observed		following order:	
compaction to HHD.		 Check for clogs and clear any obstructions to the outflow point(s). 	
Do not perform maintenance on		2. Remove leaf/sediment/debris buildup from	(B, C)
portions of the facility with saturated		the bottom of the facility.	
soil.		3. Check for and clear underdrain obstructions.	(G)
		4. Report to HHD.	







SAMPLE FILTRATION FACILITY SCHEMATIC

SAMPLE FILTRATION FACILITY PHOTOS

Bio-Swale Routine Maintenance Guidelines

MEDIAN DITCH

Maintaining Bio-Swales

Scheduling: Once each	sprin	g (March 15 – May 15) and fall (September 15 – Noven	nber 15).
Feam: Facility Maintenance Technician IV	1	Spring Maintenance Work Method:	Equip./ Material
acility Maintenance Technician	3	1. Install MOT devices.	(A)
		2. Remove trash, leaves, and debris from the	(B, C)
Equipment:		facility and associated structure(s).	
MOT/Safety Equipment	А	3. Check for deterioration or damage to	
Pick-Up Truck	В	structure(s). Notify Resident Maintenance	
Shovel	С	Engineer if repair work is needed.	
Need Trimmer	D	Check for clogs and clear vegetation	(D)
Articulated or Side Arm Mower	Е	obstructing the structure(s).	
Spreader	F	5. Replace any broken/missing cleanout caps.	(H)
/acuum Truck	G	Remove accumulated sediment from the facility.	(B, C)
Material:		7. Haul removed trash, debris, vegetation, and	(B)
Screw Caps Sizes 4 and 6	Н	sediment to designated disposal area.	
SHA Turfgrass Seed Mix	I	8. Remove MOT devices.	
Type 'A' Soil Stabilization Matting	J		
Furnished Topsoil	К	Fall Maintenance Work Method:	
Class I Riprap	L	1. Install MOT devices.	(A)
		2. Remove trash, leaves, and debris from the	(B, C)
Jnit of Measure:		facility and associated structure(s).	
Each Bio-swale		3. Mow herbaceous vegetation within the	(D, E)
		SWM facility limits of mowing to a height of	
Payment:		6-inches.	
Maintaining Bio-swales should be		4. Seed sparsely vegetated areas and install	(F, I, J)
charged to Activity [TBD], with the		matting.	
approval of the Office of Highway		5. Fill eroded areas with topsoil as necessary to	(C, F, I,
Design – Highway Hydraulics Division		restore the original ground. Stabilize eroded	J, K, L)
HHD). When inspecting/supporting		areas adjacent to existing riprap with riprap.	
he work of contractors, the Agency		Else, seed and install matting.	
Code [TBD] should also be used.		6. Haul removed trash, leaves, and debris to	(B)
		designated disposal area.	
Notes:		7. Remove MOT devices.	
Follow guidelines for recommended			
personal protective equipment. Place		Troubleshooting:	
signs and other safety devices in		If water is still ponding in the facility 72 hours after	
accordance with MUTCD and WZTC.		a storm, determine the cause and resolve in the	
		following order:	
Perform all maintenance activities in		1. Check for clogs and clear any obstructions to	
a manner to prevent compaction of		the outflow point(s).	
he filter bed. Do not drive on the		2. Remove leaf/sediment/debris buildup from	(B, C)
ilter bed. Report observed		the bottom of the facility.	
compaction to HHD.		 Check for and clear underdrain obstructions. Report to HHD. 	(G)
Do not perform maintenance on portions of the facility with saturated poil.			





SAMPLE BIO-SWALE SCHEMATIC

SAMPLE BIO-SWALE PHOTOS

APPENDIX B

Stormwater Management Facility Mapping





SHA SWM Facility Overview Map

Glen Burnie

No. SWM Facilities: 252

1 inch = 10,000 feet



SHA Maintenance Shop SWM Facility Location Tile (with SWM Facilities) Tile (without SWM Facilities) Shop Boundary



Esri Topo Basemap; Accessed 2015 Maps Prepared May, 2015





Tile Map A2 Glen Burnie No. SWM Facilities: 45 ſŅ 1 inch = 2,000 feetSWM Facility Location Shop Boundary SKA shhd Baltimore atonsvill Dundalk A2 A3 A1 B2 **B1 B**3 **B**4 C2 C1 C3 C4 ANNE Arnold Crofton Esri Streets Basemap; Accessed 2015 Maps Prepared May, 2015

SHA SWM Facility























SHA SWM Facility 020014 Infiltration basin 0 25 50 100 Feet 1 inch = 100 feetſŊ \bigotimes Manhole Inlet End/Headwall Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way Shop Boundary





MD iMap 6 Inch Imagery from 2011 Maps Prepared May, 2015





















¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
1	Shan Boundary
	Shop Boundary






Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary











$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Facility Footprint Nearby Facilities
	Nearby Facilities

















SHA SWM Facility 020051

Infiltration trench

0 12.5 25 50 Feet 1 inch = 50 feetſŊ Manhole Inlet End/Headwall Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary













09.00

SHA SWM Facility 020094 Infiltration trench 0 25 50 100 Feet 1 inch = 100 feet IN Manhole Inlet End/Headwall Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way Shop Boundary









$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary





\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







SHA SWM Facility 020110

Dry pond

0 25 50 100 LIIIF Feet

1 inch = 100 feet



¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary













	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary



























SHA SWM Facility 020124

Wet pond

0 25 50 100 LIIIF Feet

1 inch = 100 feet



\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Facility Footprint Nearby Facilities
	, , , , , , , , , , , , , , , , , , ,
	Nearby Facilities













\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary














Inlet	
🔺 End/Headwall	
Pipe	
Milepoint	
Facility Footprint	
Nearby Facilities	
Approx SHA Right-of-Way	,
Shop Boundary	







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
and the second	
	Shop Boundary









	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







Inlet	
📐 End/I	Headwall
	r Structure
Pipe	
Milep	point
Facili	ty Footprint
Near	by Facilities
Appro	ox SHA Right-of-Way
Shop	Boundary











Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary















	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







Manhole
nlet
End/Headwall
Other Structure
Pipe
Ailepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary









\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
8880	Approx SHA Right-of-Way
	Shop Boundary
	End/Headwall Other Structure Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way





$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
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	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary











\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary









	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary















\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
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•	Milepoint
	Facility Footprint
	Facility Footprint
	Facility Footprint Nearby Facilities






	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary









	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary











	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary
	Other Structure Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way







$^{\odot}$	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
	Nearby Facilities Approx SHA Right-of-Way















\odot	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







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🔺 End	d/Headwall
	ner Structure
Pip	e
🔶 Mile	epoint
Fac	cility Footprint
Nea	arby Facilities
Ар	prox SHA Right-of-Way
Sho	op Boundary





😌 M	anhole
📃 In	let
🔺 E	nd/Headwall
 ○ O 	ther Structure
===== P	ipe
♦ M	ilepoint
Fi	acility Footprint
N	earby Facilities
A	pprox SHA Right-of-Way
S	hop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Inlet	
🛕 End/Headwall	
Pipe	
Milepoint	
Facility Footprint	
Nearby Facilities	
Approx SHA Right-of-	Way
Shop Boundary	







${}^{\bigcirc}$	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







SHA SWM Facility 020247

Wet pond

0 25 50 100 LIIIFeet

1 inch = 100 feet



\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary





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nd/Headwall
ther Structure
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acility Footprint
earby Facilities
pprox SHA Right-of-Way
hop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
and a second second	
	Facility Footprint
	Facility Footprint Nearby Facilities
	, .
	Nearby Facilities







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







SHA SWM Facility 020289

Infiltration trench

0 12.5 25 50 Feet 1 inch = 50 feet



	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary



Oa Ferndale Wicklow Rd 648 020289

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	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary













¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary











SHA SWM Facility 020408

Infiltration trench

0 12.5 25 50

1 inch = 50 feet



🚱 Manhole	
Inlet	
End/Headwall	
Pipe	
Milepoint	
Facility Footprint	
Nearby Facilities	
Approx SHA Right-of-Way	/
Shop Boundary	



Perndale Wicklow Rd 6 020408

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$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary






















$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	•
	Facility Footprint
	Facility Footprint Nearby Facilities
	, .
	Nearby Facilities





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290803.004

SHA SWM Facility 020436

Wet pond

0 25 50 100 LIIIF Feet

1 inch = 100 feet



	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary
	Shop Boundary





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Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary















SHA SWM Facility 020446 Infiltration trench

50

0 12.5 25

Feet 1 inch = 50 feetŅ Manhole Inlet End/Headwall Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way Shop Boundary





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\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary
Transmission of	



















	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary















\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary
▲ ↔	Other Structure Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way







Ø	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000	Approx SHA Right-of-Way
	Shop Boundary















	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







































 Inlet End/Headwall Other Structure Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way 	\bigcirc	Manhole
 Other Structure Pipe Milepoint Facility Footprint Nearby Facilities 		Inlet
 Pipe Milepoint Facility Footprint Nearby Facilities 		End/Headwall
 Milepoint Facility Footprint Nearby Facilities 	\bigcirc	Other Structure
Facility Footprint		Pipe
Nearby Facilities	•	Milepoint
		Facility Footprint
Approx SHA Right-of-Way		Nearby Facilities
and the second	1000	Approx SHA Right-of-Way
Shop Boundary		Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







SHA SWM Facility 020524

Wet pond

0 25 50 100 LIIIFeet

1 inch = 100 feet



$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	NATION AT A
•	Milepoint
	Facility Footprint
	Facility Footprint
	Facility Footprint Nearby Facilities





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Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary










\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary











$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
	Nearby Facilities Approx SHA Right-of-Way

























Inlet A End/Headwall	
🔺 End/Headwall	
Pipe	
Milepoint	
Facility Footprint	
Nearby Facilities	
Approx SHA Right-	of-Way
Shop Boundary	













¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
	Nearby Facilities Approx SHA Right-of-Way
	-









$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Facility Footprint Nearby Facilities
	Nearby Facilities









\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Manhole
nlet
End/Headwall
Other Structure
Pipe
Ailepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







SHA SWM Facility 020556

Infiltration trench

0 25 50 100 LIIIF Feet

1 inch = 100 feet



 Inlet End/Headwall Other Structure
 △ Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary





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Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary





















\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary















Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary



















	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









😚 Ma	anhole
Inle	et
📐 En	d/Headwall
	her Structure
Pip	be
♦ Mi	epoint
Fa	cility Footprint
Ne	arby Facilities
Ap	prox SHA Right-of-Way
Sh	op Boundary







¢	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary























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SHA SWM Facility 020755 Infiltration trench 0 12.5 25 50 Feet 1 inch = 50 feetIN Manhole Inlet End/Headwall \wedge Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way



Shop Boundary



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	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
	Nearby Facilities Approx SHA Right-of-Way
	-









$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۸	Milepoint
•	epe
	Facility Footprint
	Facility Footprint
	Facility Footprint Nearby Facilities















Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary















\diamond	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	-
	Facility Footprint
	Facility Footprint Nearby Facilities
	Nearby Facilities













	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary
 ↓ ↓	Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









Ø	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Chan Davidani
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







SHA SWM Facility 020818 Surface sand filter 0 25 50 100 Feet 1 inch = 100 feetſŊ Manhole Inlet End/Headwall \wedge Other Structure \bigcirc Pipe Milepoint Facility Footprint Nearby Facilities

Approx SHA Right-of-Way

Shop Boundary





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 Inlet End/Headwall Other Structure 	\bigcirc	Manhole
		Inlet
		End/Headwall
	\bigcirc	Other Structure
Pipe		Pipe
Milepoint	۲	Milepoint
Facility Footprint		Facility Footprint
Nearby Facilities		Nearby Facilities
Approx SHA Right-of-Way	1000	Approx SHA Right-of-Way
Shop Boundary		Shop Boundary

















\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6003	Approx SHA Right-of-Way
	Shop Boundary
▲ ↔	Other Structure Pipe Milepoint Facility Footprint Nearby Facilities Approx SHA Right-of-Way







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







\odot	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
10003	Approx SHA Right-of-Way
	Shop Boundary













Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary











SHA SWM Facility 020837 Infiltration trench

Feet

1 inch = 100 feet



\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
10000	Approx SHA Right-of-Way
100 C - 100 C	ippion of intragin of thay
	Shop Boundary





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Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary













SHA SWM Facility 020840

Wet pond

0 25 50 100 Feet

1 inch = 100 feet



$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







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Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary











	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary













Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







Inlet	
🔺 End/Headwall	
Pipe	
Milepoint	
Facility Footprint	
Nearby Facilities	
Approx SHA Right-of-W	/ay
Shop Boundary	















$ \bigcirc $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
٠	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary













 Inlet End/Headwall Other Structure Pipe Milepoint 	\diamond	Manhole
 Other Structure Pipe 		Inlet
Pipe		End/Headwall
	\bigcirc	Other Structure
Milepoint		Pipe
	۲	Milepoint
Facility Footprint		Facility Footprint
Nearby Facilities		Nearby Facilities
Approx SHA Right-of-Way	600	Approx SHA Right-of-Way
Shop Boundary		Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary











\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary









Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary







\bigcirc	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
1000	Approx SHA Right-of-Way
	Shop Boundary







Manhole
Inlet
End/Headwall
Other Structure
Pipe
Milepoint
Facility Footprint
Nearby Facilities
Approx SHA Right-of-Way
Shop Boundary













	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
۲	Milepoint
	Facility Footprint
	Nearby Facilities
600	Approx SHA Right-of-Way
	Shop Boundary









	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
•	Milepoint
	Facility Footprint
	Nearby Facilities
6000) 1	Approx SHA Right-of-Way
	Approx SHA Right-of-Way Shop Boundary





$ \odot $	Manhole
	Inlet
	End/Headwall
\bigcirc	Other Structure
	Pipe
	Milonoint
•	Milepoint
	Facility Footprint
	Facility Footprint
	Facility Footprint Nearby Facilities









APPENDIX C

Index of Stormwater Management Facilities



SWM	SW/M Engility Type	Routine Maintenance	Tile Map
Facility No.	SWM Facility Type	Category	The Map
020014	Infiltration basin	Infiltration Facility	C1
020016	Infiltration basin	Infiltration Facility	C1
020017	Infiltration basin	Infiltration Facility	C1
020018	Infiltration basin	Infiltration Facility	C1
020021	Micropool extended detention pond	Wet Pond	C1
020024	Dry pond	Dry Pond	C1
020026	Wet pond	Wet Pond	C1
020033	Infiltration trench	Infiltration Facility	C2
020037	Infiltration basin	Infiltration Facility	C2
020044	Dry pond	Dry Pond	C2
020048	Infiltration basin	Infiltration Facility	C2
020051	Infiltration trench	Infiltration Facility	C2
020062	Infiltration trench	Infiltration Facility	C2
020063	Infiltration trench	Infiltration Facility	C2
020084	Infiltration trench	Infiltration Facility	C2
020088	Dry pond	Dry Pond	C2
020092	Infiltration trench	Infiltration Facility	B1
020093	Infiltration basin	Infiltration Facility	B1
020094	Infiltration trench	Infiltration Facility	B1
020095	Wet pond	Wet Pond	B1
020096	Wet pond	Wet Pond	B1
020098	Dry swale	Bio-Swale	B1
020099	Dry swale	Bio-Swale	B1
020101	Infiltration trench	Infiltration Facility	B1
020103	Wet pond	Wet Pond	B1
020108	Infiltration basin	Infiltration Facility	B1
020109	Infiltration basin	Infiltration Facility	B1
020110	Dry pond	Dry Pond	B1
020111	Infiltration basin	Infiltration Facility	B1
020112	Bioretention	Filtration Facility	B1
020113	Wet pond	Wet Pond	B1
020114	Wet pond	Wet Pond	B1
020115	Wet extended detention pond	Wet Pond	B1
020117	Infiltration trench	Infiltration Facility	B1
020120	Infiltration basin	Infiltration Facility	B2
020121	Infiltration basin	Infiltration Facility	B2
020122	Infiltration basin	Infiltration Facility	B2
020124	Wet pond	Wet Pond	B2

SWM	SWM Facility Type	Routine Maintenance	Tile Map
Facility No.	S w w Facility Type	Category	ine map
020142	Infiltration trench	Infiltration Facility	A2
020143	Infiltration trench	Infiltration Facility	A2
020144	Infiltration trench	Infiltration Facility	A2
020150	Infiltration trench	Infiltration Facility	A2
020151	Infiltration trench	Infiltration Facility	A2
020152	Infiltration trench	Infiltration Facility	A2
020155	Infiltration trench	Infiltration Facility	A2
020156	Shallow marsh	Wet Pond	A1
020157	Infiltration basin	Infiltration Facility	Al
020189	Infiltration trench	Infiltration Facility	C2
020190	Infiltration trench	Infiltration Facility	C2
020191	Infiltration trench	Infiltration Facility	C2
020192	Infiltration trench	Infiltration Facility	C2
020193	Infiltration trench	Infiltration Facility	C2
020194	Infiltration trench	Infiltration Facility	C2
020195	Infiltration trench	Infiltration Facility	C2
020196	Infiltration trench	Infiltration Facility	C2
020197	Infiltration trench	Infiltration Facility	C2
020198	Infiltration trench	Infiltration Facility	C2
020200	Infiltration trench	Infiltration Facility	C2
020201	Surface sand filter	Filtration Facility	C2
020203	Infiltration trench	Infiltration Facility	C2
020204	Infiltration trench	Infiltration Facility	C2
020205	Infiltration trench	Infiltration Facility	C2
020206	Infiltration trench	Infiltration Facility	C2
020208	Infiltration trench	Infiltration Facility	C2
020209	Infiltration trench	Infiltration Facility	C2
020210	Infiltration trench	Infiltration Facility	C2
020211	Infiltration trench	Infiltration Facility	C2
020212	Infiltration trench	Infiltration Facility	C2
020215	Infiltration trench	Infiltration Facility	C2
020216	Infiltration trench	Infiltration Facility	C2
020217	Infiltration trench	Infiltration Facility	C2
020218	Infiltration trench	Infiltration Facility	C2
020219	Infiltration trench	Infiltration Facility	C2
020220	Infiltration trench	Infiltration Facility	C2
020222	Dry pond	Dry Pond	B2
020223	Infiltration trench	Infiltration Facility	B2

SWM	SWM Facility Type	Routine Maintenance	Tile Map
Facility No.	S will Facility Type	Category	ine map
020224	Infiltration trench	Infiltration Facility	B2
020226	Infiltration trench	Infiltration Facility	B2
020228	Infiltration trench	Infiltration Facility	B2
020229	Wet pond	Wet Pond	B2
020230	Infiltration trench	Infiltration Facility	B2
020231	Infiltration trench	Infiltration Facility	B2
020232	Dry pond	Dry Pond	B2
020233	Infiltration trench	Infiltration Facility	B2
020235	Dry pond	Dry Pond	B2
020236	Infiltration trench	Infiltration Facility	A2
020237	Infiltration trench	Infiltration Facility	A2
020239	Dry pond	Dry Pond	C2
020240	Dry pond	Dry Pond	A2
020241	Infiltration trench	Infiltration Facility	B2
020242	Infiltration trench	Infiltration Facility	A2
020243	Infiltration trench	Infiltration Facility	A2
020244	Infiltration trench	Infiltration Facility	A2
020245	Infiltration trench	Infiltration Facility	A2
020246	Infiltration trench	Infiltration Facility	A2
020247	Wet pond	Wet Pond	A2
020248	Wet pond	Wet Pond	A2
020250	Wet pond	Wet Pond	В3
020285	Infiltration trench	Infiltration Facility	A2
020286	Infiltration trench	Infiltration Facility	A2
020289	Infiltration trench	Infiltration Facility	B2
020290	Infiltration trench	Infiltration Facility	B2
020292	Infiltration trench	Infiltration Facility	B2
020293	Infiltration trench	Infiltration Facility	B2
020294	Infiltration trench	Infiltration Facility	B2
020363	Dry pond	Dry Pond	B2
020405	Infiltration trench	Infiltration Facility	A2
020408	Infiltration trench	Infiltration Facility	B2
020418	Infiltration trench	Infiltration Facility	B1
020430	Infiltration trench	Infiltration Facility	B2
020431	Infiltration trench	Infiltration Facility	B2
020432	Infiltration trench	Infiltration Facility	B2
020433	Infiltration trench	Infiltration Facility	B2
020434	Infiltration trench	Infiltration Facility	B2

SWM	SWM Facility Type	Routine Maintenance	Tile Map
Facility No.	T ("14 4' 1 '	Category	
020435	Infiltration basin	Infiltration Facility	B2
020436	Wet pond	Wet Pond	B2
020441	Infiltration trench	Infiltration Facility	C3
020442	Infiltration trench	Infiltration Facility	C3
020443	Infiltration trench	Infiltration Facility	C3
020444	Infiltration trench	Infiltration Facility	C3
020445	Infiltration trench	Infiltration Facility	C3
020446	Infiltration trench	Infiltration Facility	C3
020447	Infiltration trench	Infiltration Facility	C3
020448	Infiltration trench	Infiltration Facility	C3
020449	Infiltration trench	Infiltration Facility	C3
020450	Infiltration trench	Infiltration Facility	C3
020451	Infiltration trench	Infiltration Facility	C3
020452	Infiltration trench	Infiltration Facility	C3
020453	Infiltration trench	Infiltration Facility	C3
020456	Infiltration trench	Infiltration Facility	B1
020467	Wet pond	Wet Pond	B2
020469	Wet pond	Wet Pond	B2
020471	Infiltration trench	Infiltration Facility	B2
020472	Infiltration trench	Infiltration Facility	B2
020474	Wet pond	Wet Pond	B2
020475	Infiltration trench	Infiltration Facility	B2
020478	Wet extended detention pond	Wet Pond	B2
020497	Infiltration trench	Infiltration Facility	B3
020498	Infiltration trench	Infiltration Facility	B3
020501	Infiltration trench	Infiltration Facility	B3
020503	Infiltration trench	Infiltration Facility	B3
020504	Infiltration trench	Infiltration Facility	B3
020512	Dry pond	Dry Pond	A2
020513	Infiltration basin	Infiltration Facility	A2
020523	Infiltration trench	Infiltration Facility	C2
020524	Wet pond	Wet Pond	C2
020532	Infiltration trench	Infiltration Facility	A2
020533	Infiltration trench	Infiltration Facility	A2
020535	Infiltration trench	Infiltration Facility	B2
020536	Infiltration trench	Infiltration Facility	B1
020530	Infiltration trench	Infiltration Facility	B1 B2
020538	Infiltration trench	Infiltration Facility	B2 B2

SWM Facility Type	Routine Maintenance	Tile Map
		B2
		B2
	ž	B2
	· · · ·	B2
*		B2
Wet pond	Wet Pond	B2
Dry pond	Dry Pond	B2
Micropool extended detention pond	Wet Pond	B2
Wet pond	Wet Pond	C2
Dry pond	Dry Pond	C2
Wet pond	Wet Pond	C2
Dry pond	Dry Pond	C2
Infiltration trench	Infiltration Facility	C2
Infiltration trench	Infiltration Facility	C2
Infiltration trench	Infiltration Facility	B3
Infiltration trench	Infiltration Facility	C3
Infiltration trench	Infiltration Facility	C3
Infiltration trench	Infiltration Facility	C2
Infiltration trench	Infiltration Facility	B3
Dry extended detention pond	Dry Pond	A2
Infiltration trench	Infiltration Facility	A2
Infiltration trench		A2
Infiltration trench		A2
Wet pond	Wet Pond	B2
<u>^</u>	Wet Pond	B2
		B2
	-	A1
Infiltration basin		A2
		A2
		A2
* *		A2
	÷	A1
		Al
· · ·		B1
		B1 B2
		A2
	-	A2
Infiltration trench	Infiltration Facility	B1
	Micropool extended detention pond Wet pond Dry pond Ury pond Infiltration trench Infiltration trench Infiltration trench Infiltration trench Infiltration trench Infiltration trench Infiltration trench Dry extended detention pond Infiltration trench Infiltration trench Infiltration trench Infiltration trench Micropool extended detention pond Surface sand filter Infiltration basin Infiltration basin Infiltration basin Infiltration basin Dry pond Dry extended detention pond Wet extended detention pond Iry extended detention pond Micropool content basin Infiltration trench Infiltration trench Infiltration trench Infiltration trench	SWM Facility TypeCategoryInfiltration trenchInfiltration FacilityInfiltration trenchInfiltration FacilityInfiltration trenchInfiltration FacilityWet pondWet PondWet pondWet PondDry pondDry PondMicropool extended detention pondWet PondWet pondWet PondWet pondWet PondMicropool extended detention pondWet PondDry pondDry PondDry pondDry PondDry pondDry PondInfiltration trenchInfiltration FacilityInfiltration basinInfiltration FacilityInfiltration basinInfiltration FacilityInfiltration basin <td< td=""></td<>

SWM	SWM Facility Type	Routine Maintenance	Tile Map
Facility No.		Category	-
020792	Infiltration trench	Infiltration Facility	B3
020793	Infiltration trench	Infiltration Facility	B3
020794	Infiltration trench	Infiltration Facility	B3
020795	Infiltration trench	Infiltration Facility	B3
020796	Infiltration trench	Infiltration Facility	B3
020799	Infiltration basin	Infiltration Facility	B3
020800	Infiltration basin	Infiltration Facility	В3
020801	Infiltration basin	Infiltration Facility	C3
020807	Infiltration trench	Infiltration Facility	B1
020808	Wet pond	Wet Pond	B1
020809	Wet pond	Wet Pond	B1
020810	Infiltration trench	Infiltration Facility	A2
020811	Infiltration trench	Infiltration Facility	A2
020812	Infiltration trench	Infiltration Facility	A2
020813	Infiltration trench	Infiltration Facility	A2
020814	Infiltration trench	Infiltration Facility	A2
020817	Surface sand filter	Filtration Facility	B1
020818	Surface sand filter	Filtration Facility	B1
020819	Surface sand filter	Filtration Facility	B1
020820	Surface sand filter	Filtration Facility	B1
020821	Surface sand filter	Filtration Facility	B1
020822	Infiltration trench	Infiltration Facility	B1
020826	Infiltration trench	Infiltration Facility	A2
020829	Infiltration trench	Infiltration Facility	C2
020830	Infiltration trench	Infiltration Facility	B2
020831	Infiltration trench	Infiltration Facility	B2
020832	Infiltration trench	Infiltration Facility	B2
020833	Pond/wetland system	Wet Pond	B2
020834	Infiltration trench	Infiltration Facility	B2
020835	Infiltration trench	Infiltration Facility	B2
020836	Infiltration trench	Infiltration Facility	B2
020837	Infiltration trench	Infiltration Facility	B2
020838	Infiltration trench	Infiltration Facility	C2
020839	Infiltration trench	Infiltration Facility	C2
020840	Wet pond	Wet Pond	C2
020845	Pond/wetland system	Wet Pond	B2
020846	Wet pond	Wet Pond	B1
020847	Infiltration trench	Infiltration Facility	A2

SWM Facility No.	SWM Facility Type	Routine Maintenance Category	Tile Map
020848	Infiltration trench	Infiltration Facility	A2
020849	Infiltration trench	Infiltration Facility	A2
020850	Infiltration basin	Infiltration Facility	A1
020851	Wet pond	Wet Pond	A1
020852	Pocket pond	Wet Pond	A1
020875	Infiltration basin	Infiltration Facility	C1
020878	Infiltration trench	Infiltration Facility	C2
020882	Infiltration trench	Infiltration Facility	C2
020891	Infiltration trench	Infiltration Facility	A2
020894	Infiltration trench	Infiltration Facility	B2
020899	Infiltration trench	Infiltration Facility	C3
020900	Infiltration trench	Infiltration Facility	C3
020902	Infiltration trench	Infiltration Facility	C2
020905	Infiltration trench	Infiltration Facility	C3
020906	Infiltration trench	Infiltration Facility	C3
020956	Wet pond	Wet Pond	B2
020957	Bioretention	Filtration Facility	B2
021016	Infiltration trench	Infiltration Facility	A2
021018	Infiltration basin	Infiltration Facility	C2
021021	Infiltration trench	Infiltration Facility	B1
021022	Infiltration basin	Infiltration Facility	B1
021090	Pocket pond	Wet Pond	B2
021535	Grass Swale	Turfgrass Maintenance	A3
021538	Infiltration trench	Infiltration Facility	B2

(Sorted By HHD Facility No.) 4 of 4

SWM	SWM Equility Type	Routine Maintenance	Tile Mon
Facility No.	SWM Facility Type	Category	Tile Map
020156	Shallow marsh	Wet Pond	A1
020157	Infiltration basin	Infiltration Facility	A1
020617	Infiltration basin	Infiltration Facility	A1
020696	Dry extended detention pond	Dry Pond	A1
020697	Dry extended detention pond	Dry Pond	A1
020850	Infiltration basin	Infiltration Facility	A1
020851	Wet pond	Wet Pond	A1
020852	Pocket pond	Wet Pond	A1
020142	Infiltration trench	Infiltration Facility	A2
020143	Infiltration trench	Infiltration Facility	A2
020144	Infiltration trench	Infiltration Facility	A2
020150	Infiltration trench	Infiltration Facility	A2
020151	Infiltration trench	Infiltration Facility	A2
020152	Infiltration trench	Infiltration Facility	A2
020155	Infiltration trench	Infiltration Facility	A2
020236	Infiltration trench	Infiltration Facility	A2
020237	Infiltration trench	Infiltration Facility	A2
020240	Dry pond	Dry Pond	A2
020242	Infiltration trench	Infiltration Facility	A2
020243	Infiltration trench	Infiltration Facility	A2
020244	Infiltration trench	Infiltration Facility	A2
020245	Infiltration trench	Infiltration Facility	A2
020246	Infiltration trench	Infiltration Facility	A2
020247	Wet pond	Wet Pond	A2
020248	Wet pond	Wet Pond	A2
020285	Infiltration trench	Infiltration Facility	A2
020286	Infiltration trench	Infiltration Facility	A2
020405	Infiltration trench	Infiltration Facility	A2
020512	Dry pond	Dry Pond	A2
020513	Infiltration basin	Infiltration Facility	A2
020532	Infiltration trench	Infiltration Facility	A2
020533	Infiltration trench	Infiltration Facility	A2
020566	Dry extended detention pond	Dry Pond	A2
020568	Infiltration trench	Infiltration Facility	A2
020572	Infiltration trench	Infiltration Facility	A2
020573	Infiltration trench	Infiltration Facility	A2
020618	Infiltration basin	Infiltration Facility	A2
020619	Infiltration basin	Infiltration Facility	A2

SWM		Routine Maintenance	
Facility No.	SWM Facility Type	Category	Tile Map
020620	Dry pond	Dry Pond	A2
020622	Dry pond	Dry Pond	A2
020754	Infiltration trench	Infiltration Facility	A2
020755	Infiltration trench	Infiltration Facility	A2
020810	Infiltration trench	Infiltration Facility	A2
020811	Infiltration trench	Infiltration Facility	A2
020812	Infiltration trench	Infiltration Facility	A2
020813	Infiltration trench	Infiltration Facility	A2
020814	Infiltration trench	Infiltration Facility	A2
020826	Infiltration trench	Infiltration Facility	A2
020847	Infiltration trench	Infiltration Facility	A2
020848	Infiltration trench	Infiltration Facility	A2
020849	Infiltration trench	Infiltration Facility	A2
020891	Infiltration trench	Infiltration Facility	A2
021016	Infiltration trench	Infiltration Facility	A2
021535	Grass Swale	Turfgrass Maintenance	A3
020092	Infiltration trench	Infiltration Facility	B1
020093	Infiltration basin	Infiltration Facility	B1
020094	Infiltration trench	Infiltration Facility	B1
020095	Wet pond	Wet Pond	B1
020096	Wet pond	Wet Pond	B1
020098	Dry swale	Bio-Swale	B1
020099	Dry swale	Bio-Swale	B1
020101	Infiltration trench	Infiltration Facility	B1
020103	Wet pond	Wet Pond	B1
020108	Infiltration basin	Infiltration Facility	B1
020109	Infiltration basin	Infiltration Facility	B1
020110	Dry pond	Dry Pond	B1
020111	Infiltration basin	Infiltration Facility	B1
020112	Bioretention	Filtration Facility	B1
020113	Wet pond	Wet Pond	B1
020114	Wet pond	Wet Pond	B1
020115	Wet extended detention pond	Wet Pond	B1
020117	Infiltration trench	Infiltration Facility	B1
020418	Infiltration trench	Infiltration Facility	B1
020456	Infiltration trench	Infiltration Facility	B1
020536	Infiltration trench	Infiltration Facility	B1
020752	Wet extended detention pond	Wet Pond	B1

SWM	SWM Equility Type	Routine Maintenance	Tile Mon
Facility No.	SWM Facility Type	Category	Tile Map
020772	Infiltration trench	Infiltration Facility	B1
020807	Infiltration trench	Infiltration Facility	B1
020808	Wet pond	Wet Pond	B1
020809	Wet pond	Wet Pond	B1
020817	Surface sand filter	Filtration Facility	B1
020818	Surface sand filter	Filtration Facility	B1
020819	Surface sand filter	Filtration Facility	B1
020820	Surface sand filter	Filtration Facility	B1
020821	Surface sand filter	Filtration Facility	B1
020822	Infiltration trench	Infiltration Facility	B1
020846	Wet pond	Wet Pond	B1
021021	Infiltration trench	Infiltration Facility	B1
021022	Infiltration basin	Infiltration Facility	B1
020120	Infiltration basin	Infiltration Facility	B2
020121	Infiltration basin	Infiltration Facility	B2
020122	Infiltration basin	Infiltration Facility	B2
020124	Wet pond	Wet Pond	B2
020222	Dry pond	Dry Pond	B2
020223	Infiltration trench	Infiltration Facility	B2
020224	Infiltration trench	Infiltration Facility	B2
020226	Infiltration trench	Infiltration Facility	B2
020228	Infiltration trench	Infiltration Facility	B2
020229	Wet pond	Wet Pond	B2
020230	Infiltration trench	Infiltration Facility	B2
020231	Infiltration trench	Infiltration Facility	B2
020232	Dry pond	Dry Pond	B2
020233	Infiltration trench	Infiltration Facility	B2
020235	Dry pond	Dry Pond	B2
020241	Infiltration trench	Infiltration Facility	B2
020289	Infiltration trench	Infiltration Facility	B2
020290	Infiltration trench	Infiltration Facility	B2
020292	Infiltration trench	Infiltration Facility	B2
020293	Infiltration trench	Infiltration Facility	B2
020294	Infiltration trench	Infiltration Facility	B2
020363	Dry pond	Dry Pond	B2
020408	Infiltration trench	Infiltration Facility	B2
020430	Infiltration trench	Infiltration Facility	B2
020431	Infiltration trench	Infiltration Facility	B2

SWM		Routine Maintenance	
Facility No.	SWM Facility Type	Category	Tile Map
020432	Infiltration trench	Infiltration Facility	B2
020433	Infiltration trench	Infiltration Facility	B2
020434	Infiltration trench	Infiltration Facility	B2
020435	Infiltration basin	Infiltration Facility	B2
020436	Wet pond	Wet Pond	B2
020467	Wet pond	Wet Pond	B2
020469	Wet pond	Wet Pond	B2
020471	Infiltration trench	Infiltration Facility	B2
020472	Infiltration trench	Infiltration Facility	B2
020474	Wet pond	Wet Pond	B2
020475	Infiltration trench	Infiltration Facility	B2
020478	Wet extended detention pond	Wet Pond	B2
020534	Infiltration trench	Infiltration Facility	B2
020537	Infiltration trench	Infiltration Facility	B2
020538	Infiltration trench	Infiltration Facility	B2
020539	Infiltration trench	Infiltration Facility	B2
020540	Infiltration trench	Infiltration Facility	B2
020541	Infiltration trench	Infiltration Facility	B2
020542	Infiltration trench	Infiltration Facility	B2
020544	Wet pond	Wet Pond	B2
020546	Wet pond	Wet Pond	B2
020547	Dry pond	Dry Pond	B2
020548	Micropool extended detention pond	Wet Pond	B2
020601	Wet pond	Wet Pond	B2
020614	Micropool extended detention pond	Wet Pond	B2
020615	Surface sand filter	Filtration Facility	B2
020753	Infiltration trench	Infiltration Facility	B2
020830	Infiltration trench	Infiltration Facility	B2
020831	Infiltration trench	Infiltration Facility	B2
020832	Infiltration trench	Infiltration Facility	B2
020833	Pond/wetland system	Wet Pond	B2
020834	Infiltration trench	Infiltration Facility	B2
020835	Infiltration trench	Infiltration Facility	B2
020836	Infiltration trench	Infiltration Facility	B2
020837	Infiltration trench	Infiltration Facility	B2
020845	Pond/wetland system	Wet Pond	B2
020894	Infiltration trench	Infiltration Facility	B2
020956	Wet pond	Wet Pond	B2

SWM	SWM Facility Type	Routine Maintenance	Tile Map
Facility No.	Swivi Pacifity Type	Category	i ne map
020957	Bioretention	Filtration Facility	B2
021090	Pocket pond	Wet Pond	B2
021538	Infiltration trench	Infiltration Facility	B2
020250	Wet pond	Wet Pond	B3
020497	Infiltration trench	Infiltration Facility	B3
020498	Infiltration trench	Infiltration Facility	B3
020501	Infiltration trench	Infiltration Facility	B3
020503	Infiltration trench	Infiltration Facility	B3
020504	Infiltration trench	Infiltration Facility	B3
020555	Infiltration trench	Infiltration Facility	B3
020565	Infiltration trench	Infiltration Facility	B3
020792	Infiltration trench	Infiltration Facility	B3
020793	Infiltration trench	Infiltration Facility	B3
020794	Infiltration trench	Infiltration Facility	B3
020795	Infiltration trench	Infiltration Facility	B3
020796	Infiltration trench	Infiltration Facility	B3
020799	Infiltration basin	Infiltration Facility	B3
020800	Infiltration basin	Infiltration Facility	B3
020014	Infiltration basin	Infiltration Facility	C1
020016	Infiltration basin	Infiltration Facility	C1
020017	Infiltration basin	Infiltration Facility	C1
020018	Infiltration basin	Infiltration Facility	C1
020021	Micropool extended detention pond	Wet Pond	C1
020024	Dry pond	Dry Pond	C1
020026	Wet pond	Wet Pond	C1
020875	Infiltration basin	Infiltration Facility	C1
020033	Infiltration trench	Infiltration Facility	C2
020037	Infiltration basin	Infiltration Facility	C2
020044	Dry pond	Dry Pond	C2
020048	Infiltration basin	Infiltration Facility	C2
020051	Infiltration trench	Infiltration Facility	C2
020062	Infiltration trench	Infiltration Facility	C2
020063	Infiltration trench	Infiltration Facility	C2
020084	Infiltration trench	Infiltration Facility	C2
020088	Dry pond	Dry Pond	C2
020189	Infiltration trench	Infiltration Facility	C2
020190	Infiltration trench	Infiltration Facility	C2
020191	Infiltration trench	Infiltration Facility	C2

SWM Facility No.	SWM Facility Type	Routine Maintenance Category	Tile Map
020192	Infiltration trench	Infiltration Facility	C2
020192	Infiltration trench	Infiltration Facility	C2
020193	Infiltration trench	Infiltration Facility	C2 C2
020194	Infiltration trench	Infiltration Facility	C2 C2
020195	Infiltration trench	-	C2 C2
020196		Infiltration Facility	C2 C2
	Infiltration trench	Infiltration Facility	
020198	Infiltration trench	Infiltration Facility	C2
020200	Infiltration trench	Infiltration Facility	C2
020201	Surface sand filter	Filtration Facility	C2
020203	Infiltration trench	Infiltration Facility	C2
020204	Infiltration trench	Infiltration Facility	C2
020205	Infiltration trench	Infiltration Facility	C2
020206	Infiltration trench	Infiltration Facility	C2
020208	Infiltration trench	Infiltration Facility	C2
020209	Infiltration trench	Infiltration Facility	C2
020210	Infiltration trench	Infiltration Facility	C2
020211	Infiltration trench	Infiltration Facility	C2
020212	Infiltration trench	Infiltration Facility	C2
020215	Infiltration trench	Infiltration Facility	C2
020216	Infiltration trench	Infiltration Facility	C2
020217	Infiltration trench	Infiltration Facility	C2
020218	Infiltration trench	Infiltration Facility	C2
020219	Infiltration trench	Infiltration Facility	C2
020220	Infiltration trench	Infiltration Facility	C2
020239	Dry pond	Dry Pond	C2
020523	Infiltration trench	Infiltration Facility	C2
020524	Wet pond	Wet Pond	C2
020549	Wet pond	Wet Pond	C2
020550	Dry pond	Dry Pond	C2
020551	Wet pond	Wet Pond	C2
020552	Dry pond	Dry Pond	C2
020553	Infiltration trench	Infiltration Facility	C2
020555	Infiltration trench	Infiltration Facility	C2
020564	Infiltration trench	Infiltration Facility	C2
020829	Infiltration trench	Infiltration Facility	C2
020838	Infiltration trench	Infiltration Facility	C2
020839	Infiltration trench	Infiltration Facility	C2
020839	Wet pond	Wet Pond	C2 C2

SWM Facility No.	SWM Facility Type	Routine Maintenance Category	Tile Map
020878	Infiltration trench	Infiltration Facility	C2
020882	Infiltration trench	Infiltration Facility	C2
020902	Infiltration trench	Infiltration Facility	C2
021018	Infiltration basin	Infiltration Facility	C2
020441	Infiltration trench	Infiltration Facility	C3
020442	Infiltration trench	Infiltration Facility	C3
020443	Infiltration trench	Infiltration Facility	C3
020444	Infiltration trench	Infiltration Facility	C3
020445	Infiltration trench	Infiltration Facility	C3
020446	Infiltration trench	Infiltration Facility	C3
020447	Infiltration trench	Infiltration Facility	C3
020448	Infiltration trench	Infiltration Facility	C3
020449	Infiltration trench	Infiltration Facility	C3
020450	Infiltration trench	Infiltration Facility	C3
020451	Infiltration trench	Infiltration Facility	C3
020452	Infiltration trench	Infiltration Facility	C3
020453	Infiltration trench	Infiltration Facility	C3
020556	Infiltration trench	Infiltration Facility	C3
020557	Infiltration trench	Infiltration Facility	C3
020801	Infiltration basin	Infiltration Facility	C3
020899	Infiltration trench	Infiltration Facility	C3
020900	Infiltration trench	Infiltration Facility	C3
020905	Infiltration trench	Infiltration Facility	C3
020906	Infiltration trench	Infiltration Facility	C3

(Sorted By Tile Map) 4 of 4