

Appendix C2: Field Screening Plan, 2016





Field Screening Plan

**For the City and County of Honolulu
Municipal Separate Storm Sewer System
National Pollutant Discharge Elimination System
Permit No. HI S000002**

Final

Revised February 2016

**Prepared by
Department of Facility Maintenance, Storm Water Quality Branch
City and County of Honolulu**



This page is intentionally left blank.

Table of Contents

TABLE OF CONTENTS I

DEFINITION AND ACRONYMS II

REFERENCES..... III

SECTION 1 – BACKGROUND 1

 1.1 Introduction..... 1

 1.2 Purpose and Scope..... 2

SECTION 2 – CRITERIA AND METHODOLOGY 2

 2.1 Outfall and Point Source Definition 2

 2.2 Field Investigation Form..... 2

 2.3 Outfall Inventory and Map Preparation 5

 2.4 Dry Weather Inspection Periods 5

 2.5 Field Inspection Data Storage..... 5

SECTION 3 – PRIORITY-BASED RANKING PROCESS 5

SECTION 4 – PRIORITY-BASED SYSTEM CRITERIA..... 6

 4.1 Criteria 1 - Total Maximum Daily Load, Waikiki, and Downtown-Chinatown Areas 6

 4.2 Criteria 2 - Catch Basin and Grated Drain Inlet Severity (FY10-FY16)..... 7

 4.3 Criteria 3 - Industrial and Commercial Facilities 10

 4.4 Criteria 4 - Previous Storm Water Violations..... 11

 4.5 Criteria 5 - Areas Heavily Occupied by Homeless..... 12

SECTION 5 - PRIORITY AREA INSPECTION SCHEDULE FOR FIELD SCREENING 13

 5.1 Priority Schedule 13

SECTION 6 – FIELD INSPECTIONS PROCEDURES..... 15

 6.1 Inspection Areas 16

 6.2 Inaccessible Outfall Inspections 16

 6.3 Submerged Outfall..... 16

 6.4 Outfalls with Observed Flow..... 17

 6.5 Outfalls without Observed Flow..... 18

 6.6 Potential Illicit Flow 19

 6.7 Potential Illicit Connection..... 20

 6.8 Structures with Unknown ID and Incorrect Classification 20

 6.9 Outfalls Not Found 20

APPENDIX A: Sample Outfall Field Screening Map

Definition and Acronyms

City	City and County of Honolulu
CB	Catch Basin
CWB	Clean Water Branch, Department of Health, State of Hawaii
DOH	Department of Health, State of Hawaii
DFM	Department of Facility Maintenance, City and County of Honolulu (from July 1, 1998)
EPA	U.S. Environmental Protection Agency
GDI	Grated Drain Inlet
GIS	Geographic Information System
HoLIS	Honolulu Land Information System
MS4	Municipal Separate Storm Sewer System
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
Permit	National Pollutant Discharge Elimination System Permit No. HI S000002
ROE	Right of Entry
ROH	Revised Ordinances of the City and County of Honolulu
State	State of Hawaii
SWQ	Storm Water Quality Branch, Department of Facility Maintenance, City and County of Honolulu
TMDL	Total Maximum Daily Load

References

Draft “2014 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to 303(d) and 305(b), Clean Water Act (P.L. 97-117),” The Hawaii Department of Health, April 2014

Enforcement Records, City and County of Honolulu, Department of Facilities Maintenance, Storm Water Quality, 7/8/15.

“Priority-Based Inspection and Maintenance Plan,” City and County of Honolulu, (to be submitted February 2016)

Location of Industrial Facilities, City and County of Honolulu, Department of Facilities Maintenance, Storm Water Quality, July 9, 2015.

Revised Ordinances of Honolulu, Chapter 14, Article 12, Drainage, Flood and Pollution Control, September 1996.

“Rules Relating to Soil Erosion Standards and Guidelines,” Department of Planning and Permitting, City and County of Honolulu, dated April 1999.

State of Hawaii Homeless Point-in-Time Count 2015. The State of Hawaii, Department of Human Services, Homeless Programs Office, April 2015

“Street Sweeping Pilot Study Plan,” City and County of Honolulu, (to be submitted February 2016)

This page is intentionally left blank.

SECTION 1 – BACKGROUND

1.1 Introduction

The City and County of Honolulu (City) received from the State Department of Health (DOH) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. HI S000002 which became effective on February 16, 2015. The City's NPDES MS4 permit authorizes the City to discharge storm water runoff and certain non-storm water discharges (Part B.2) from the City's MS4, Municipal Building Complex, Kapolei Building Complex, and City facilities into State Waters in and around the Island of Oahu.

As part of the permit requirements [Part D.1.c Illicit Discharge Detection and Elimination (IDDE)], states that:

“The Permittee shall review and update its IDDE program to detect and eliminate illicit connections and illegal discharges into its MS4.”

Any connection without a permit is considered an illicit connection and any discharge other than allowable discharges are considered to be an illegal discharge. Part B.2 of the permit identifies allowable, non-storm water discharges into the City's MS4.

As part of the permit requirements [Part D.1.c.(3)], states that

“Field Screening. Within 90 calendar days of the effective date of this permit, the Permittee shall revise its field screening plan for observing major and minor outfalls to screen for improper discharges to include procedures to evaluate observed dry weather flows and erosion at the outfalls. The field screening plan shall be included within the SWMP and any revisions thereafter reported in the Annual Report. The City shall develop defined procedures for conducting dry weather flow analyses and upstream tracking in an effort to characterize flows from the MS4 and to identify potential illicit discharges and connections. If any outfall locations are submerged at the time of inspection, the monitoring personnel shall inspect the discharge line (or contributing tributary lines), at the closest location(s) upstream of the discharge location and outside tidal influence. Additionally, the City shall establish a process for City or consultant field staff to notify ENV if dry weather flow, pollutant discharge, or erosion is observed from an MS4 outfall so the flow and erosional area can be assessed and tracked, if necessary. The plan shall also designate priority areas for screening and specify the frequency for screening. Areas used by the homeless that discharge to the MS4 shall be designated a priority.”

As a result, R.M. Towill Corporation worked with the City's Department of Facilities Maintenance Storm Water Quality Branch (DFM-SWQ) in updating the field screening plan as outlined in the following document.

1.2 Purpose and Scope

The field screening plan will be established to ensure consistent and thorough inspections. The plan establishes a process for inspecting outfalls with illegal discharges as well as evaluation of flow, structure condition, erosion, and blockage. The plan details the methodology of inspections including protocol for tidally influenced or submerged outfalls and inaccessible outfalls.

The field screening plan will establish a process for:

- 1) Inspecting outfalls for illegal discharges.
- 2) Evaluating the condition of the outfall including an assessment of damaged structures, outlet blockages, and erosion around outfall structures.
- 3) Evaluating and identifying dry weather flows and determining potential illicit connections.
- 4) Documenting data for coordination of follow-up action and possible enforcement.

SECTION 2 – CRITERIA AND METHODOLOGY

2.1 Outfall and Point Source Definition

EPA regulations define “outfall” at 40 CFR 122.26(b)(9) as follows:

“Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.”

EPA regulations define “point source” at 40 CFR 122.2 as follows:

“Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff. (See §122.3).”

2.2 Field Investigation Form

The field investigation form was developed to include general information such as the date of inspection, outfall ID and weather condition. The inspection form also includes information for outlet size and type; condition of the outfall structure and discharge, if any.

For outfalls with discharges, information such as odor, color, turbidity and floatables will be documented. A sample outfall inspection form is shown in Figure 1.

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF ENVIRONMENTAL SERVICES
STORM WATER QUALITY BRANCH
KAPOLEI, HAWAII 96707
OUTFALL INSPECTION FIELD SHEET

Section 1: Background Data

Accessible Inaccessible Not Found

Priority Area:	Outfall ID:
Inspection Date: (Choose a date)	Time: Select a time.
Investigators:	Form completed by:
Land Use in Drainage Area (Check all that apply): <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Other: _____	Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Cloudy <input type="checkbox"/> Partially Cloudy <input type="checkbox"/> Drizzle <input type="checkbox"/> Rain Past Rainfall: -3days _____ -2days _____ -1day _____

Section 2: Outfall Description

TYPE	MATERIAL	SHAPE	QUANTITY	DIMENSION	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Box <input type="checkbox"/> Elliptical <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	<input type="checkbox"/> 6 <input type="checkbox"/> 12 <input type="checkbox"/> 18 <input type="checkbox"/> 24 <input type="checkbox"/> 48 <input type="checkbox"/> 60 <input type="checkbox"/> 72 <input type="checkbox"/> 84 <input type="checkbox"/> 96 <input type="checkbox"/> 108 <input type="checkbox"/> 120 Length = ____ (in) Width = ____ (in)	<input type="checkbox"/> No <input type="checkbox"/> In Water: <input type="checkbox"/> Partially <input type="checkbox"/> Fully <input type="checkbox"/> With Sediment: <input type="checkbox"/> Partially <input type="checkbox"/> Fully
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip Rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Rectangular <input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____		Top Width = ____ (in) Bottom Width = ____ (in)	

Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Inconclusive <i>(If Inconclusive, Skip and go to Section 4)</i>
If Yes: Flow Severity	<input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial
If NO: Describe Condition	<input type="checkbox"/> Ponding Water <input type="checkbox"/> Damp Surface <input type="checkbox"/> Dry

Section 3: Physical Indicators for Flowing Outfalls Only

Are There Any Physical Indicators Present in the Flow? Yes No *(If No, Skip and go to Section 4)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/Sour <input type="checkbox"/> Petroleum/Gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily Detected	<input type="checkbox"/> 3 – Noticeable from a Distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other: _____	<input type="checkbox"/> 1 – Light	<input type="checkbox"/> 2 – Medium	<input type="checkbox"/> 3 – Dark
Turbidity	<input type="checkbox"/>	SEE SEVERITY	<input type="checkbox"/> 1 – Slight Cloudiness	<input type="checkbox"/> 2 – Cloudy	<input type="checkbox"/> 3 – Opaque
Floatables	<input type="checkbox"/>	<input type="checkbox"/> Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Trash <input type="checkbox"/> Sewage (toilet paper, etc.) <input type="checkbox"/> Other: sdf	<input type="checkbox"/> 1 – Few/Slight; origin not obvious	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible suds or oil sheen)	<input type="checkbox"/> 3 – Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

(Version 2015-07-17)

page 1 of 2

Figure 1 – Outfall Inspection Form (Page 1 of 2)

Outfall Inspection Field Sheet

Section 4: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are There Physical Indicators that are Not Related to Flow Present? Yes No *(If No, Skip and go to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion <input type="checkbox"/> Other: _____	
Deposits/Stains	<input type="checkbox"/>	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Algae <input type="checkbox"/> Sediment <input type="checkbox"/> Other: _____	
Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Slight/Sparse <input type="checkbox"/> Moderate <input type="checkbox"/> Excessive	
Erosion	<input type="checkbox"/>	<input type="checkbox"/> Light <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy	

Section 5: Additional Comments & Notes

Section 6: Photos

Photo 1: (Caption)

Photo 2: (Caption)

Photo 3: (Caption)

Photo 4: (Caption)

Figure 1 – Outfall Inspection Form (Page 2 of 2)

2.3 Outfall Inventory and Map Preparation

There are approximately 2,150 outfalls identified in the Honolulu Land Information System (HoLIS) Geographic Information System (GIS) Database. The outfall inventory was downloaded to develop Outfall Field Screening Maps using the GIS data and AutoCAD software. The inventory data and maps were prepared for the priority areas and will be utilized with the outfall inspection forms to conduct the field screening inspections.

Outfall Field Screening Maps utilized for inspections shall display the entire system for the specified outfalls. All outfall structures shall be labeled with the corresponding GIS ID's, provided by HoLIS. Outfall maps for outfalls located near shore that may be submerged due to tidal influences will identify the locations of potential drainage structures that may be outside of the tidal influence for which inspections can take place. This will assist the field crews in locating potential structures for starting dry weather inspection procedures. Sample Field Screening Maps can be seen in Appendix A.

2.4 Dry Weather Inspection Periods

Dry weather inspections can only occur if the weather preceding the inspection is deemed dry. Using rainfall data from the National Weather Service found at <http://www.prh.noaa.gov/hnl/pages/hydrology.php>, inspections may proceed after readings of the nearest rain gage to the outfall is 0.00" for a 48 hours period. Inspections may occur year-round. Ideally, inspections would occur during the drier summer months between May 1st and July 31st of each year. The City's Rules Relating to Soil Erosion Standards and Guidelines, Expected Monthly Distribution of Erosive Rainfall table indicates this period as having the least amount of rainfall. Inspections shall not be conducted at any time during or immediately after rainfall events which could affect tracking of dry weather discharges or expose inspection crews to hazardous conditions.

2.5 Field Inspection Data Storage

Completed inspection forms and supporting photo documentation will be used to identify outfalls that are in poor condition and/or exhibits heavy erosion and illicit connections or illegal discharges. Outfall structures with these conditions are reported to the City for appropriate follow-up action for maintenance or enforcement. Results of all of the inspections are uploaded to the City's database system.

SECTION 3 – PRIORITY-BASED RANKING PROCESS

Scheduling of outfalls will be based on structure outfall ratings determined from the priority based ranking process which analyzes five priority based criteria. Criteria for the priority area inspections are discussed in the following sections and will include structures located in Total Maximum Daily Load (TMDL) water body areas, problematic areas such as Waikiki and Downtown-Chinatown, findings from previous and current inspection and maintenance activities, location of industrial and commercial facilities, documented storm water violations, and areas occupied by homeless persons.

The five priority based criteria will be analyzed for each of the outfalls and an overall rating will be assigned. Ratings for each of the outfalls will then be compared and a priority-based inspection and maintenance schedule will then be developed with the highest priority outfalls being scheduled first.

The priority-based system inspection and maintenance plan and schedule will be reviewed annually and updated as necessary. The changes, along with explanations of the changes shall be submitted within each respective annual report.

SECTION 4 – PRIORITY-BASED SYSTEM CRITERIA

The following criteria were used in determining the prioritized storm water structure inspection rating.

4.1 Criteria 1 - Total Maximum Daily Load, Waikiki, and Downtown-Chinatown Areas

Waikiki and Downtown-Chinatown are known problematic areas. Waikiki is a major tourist destination and thus has a high volume of pedestrians. Downtown-Chinatown is the center of business in Hawaii and home to a high number of homeless people.

Table 1 – Waikiki and Downtown-Chinatown Areas

Receiving Water Bodies
Nuuanu Stream
Kapalama Stream
Honolulu Harbor
Ala Wai Canal
Ala Wai Harbor
Mamala (East) Bay

Approved Total Maximum Daily Load water bodies are established to achieve and maintain water quality standards in areas determined by State of Hawaii Department of Health. TMDL areas are shown in Figure 2 on the following page.

Table 2 - Total Maximum Daily Load Water Bodies

Assessed Water Body
Kamooalii (Trib to Kaneohe Stream)
Kaneohe
Kapaa
Kawa
N. Fork Kaukonahua
S. Fork Kaukonahua
Waimanalo
Ala Wai Canal and Boat Harbor

*Reference: 2014 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to 303(d) and 305(b), Clean Water Act (P.L. 97-117).

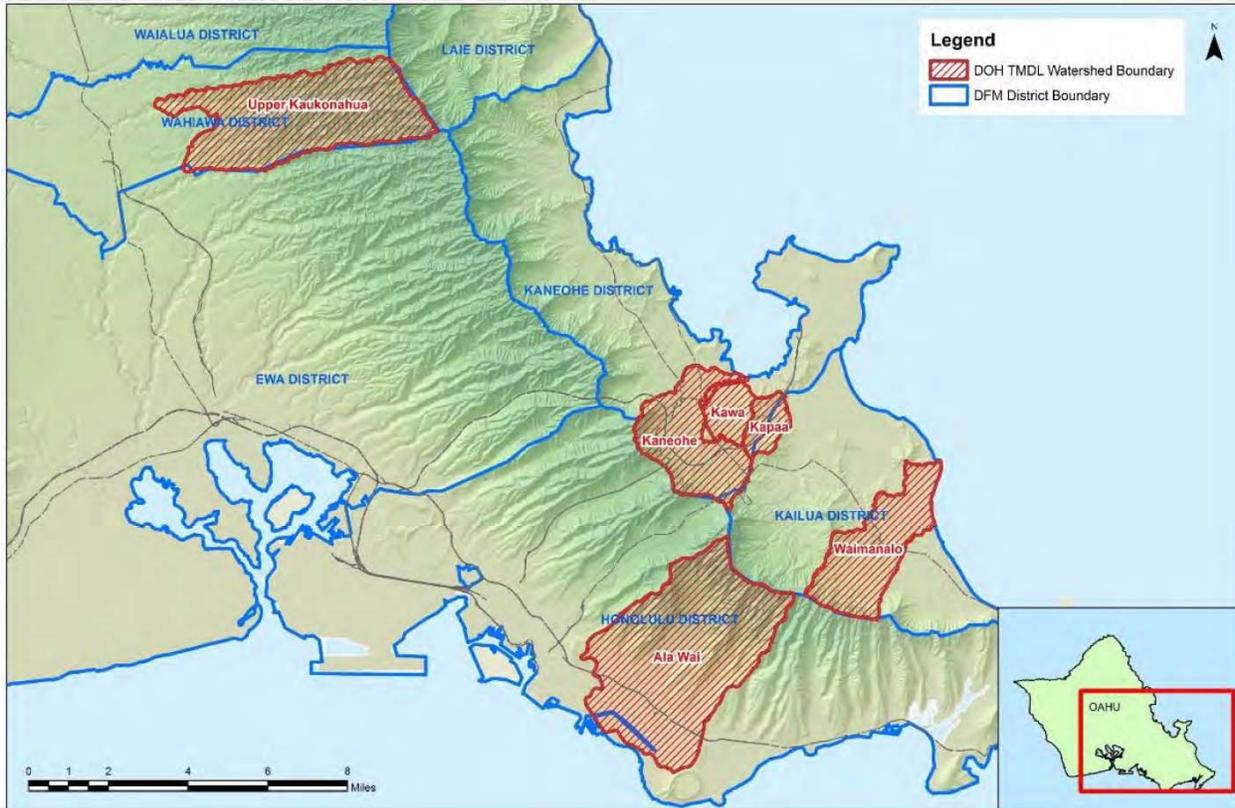


Figure 2 – TMDL Watershed Boundaries

*Reference: “Street Sweeping Pilot Study Plan,” City and County of Honolulu, (to be submitted February 2016)

1) Priority Criteria

- a) Drainage structures located in Waikiki, Downtown-Chinatown, and TMDL outfalls will be assigned a priority rating of “Critical”.

4.2 Criteria 2 - Catch Basin and Grated Drain Inlet Severity (FY10-FY16)

The database of previous and current inspections and maintenance activities were analyzed to determine the percentage of severe structures located in outfall areas. Severe structures are those structures (CB’s and inlets) which contained sediment and/or debris at the outlet pipe to a level of half full or greater. The results of the severe structures are indicated in Tables 3-5 on the following three pages.

Table 3 - Catch Basin/Inlet Severe Inspections (FY10-FY15)

Outfall	% Severe Inspections	Priority
LPBP	75.00	High
WCAA	50.00	High
WCUS	45.10	High
WCKK	40.00	High
WWAS	40.00	High
WPOH	35.78	High
WCMS	35.71	High
HAWH	33.77	High
HKB	30.81	High
WCPO	28.94	High
WCMA	27.78	High
WCKI	25.24	High
WKUS	23.81	High
WWAI	23.08	High
WCNI	22.64	High
WKWS (WKC)	21.65	High
HAML	20.87	High
LKWS	20.00	High
NKG	18.18	Medium
WPO	16.12	Medium
NPS	16.00	Medium
WKAB	15.58	Medium
LWBM	14.89	Medium
HEMB	14.73	Medium
LBPH	12.90	Medium
WMAA	12.50	Medium
HKS	12.00	Medium
HHB	11.92	Medium
WWES	11.76	Medium
NHG	11.11	Medium
HMIS	11.06	Medium
HKMS	10.58	Medium
LWMB	10.57	Medium
HAWC	10.40	Medium
HKL	9.76	Low
WPOK	9.09	Low
HMAS	9.01	Low

Outfall	% Severe Inspections	Priority
NPNS	8.41	Low
LAG	8.40	Low
LWAS	8.25	Low
LLG	8.16	Low
LWUS	8.06	Low
HKPW	8.00	Low
HWG	7.04	Low
WMIO	6.98	Low
HNUS	6.91	Low
HKKS	6.90	Low
WPOL	6.78	Low
HWNS	6.73	Low
WOAC	6.72	Low
CNFK	6.67	Low
NKAA	6.25	Low
WKKI	6.25	Low
HKAS	6.18	Low
HPMS	5.13	Low
LKLC	5.12	Low
HMB	5.01	Low
HWS	5.00	Low
LPHW	5.00	Low
LEGA	4.98	Low
LHIS	4.95	Low
LWOS	4.88	Low
CPOS	4.76	Low
HKKI	4.65	Low
LWIS	4.64	Low
LPG	4.60	Low
HKAE	4.52	Low
LWES	4.47	Low
HSL/SLB	4.30	Low
HKIS	4.29	Low
WKIP	4.27	Low
WKNB	4.17	Low
LOPM	4.10	Low
CWAS	4.09	Low

Table 4 - Catch Basin/Inlet Severe Inspections (FY10-FY15, cont.)

Outfall	% Severe Inspections	Priority
WKEB	3.88	Low
LKAS	3.50	Low
LPHE	3.10	Low
HPNS	2.99	Low
LEWA	2.94	Low
WMAS	2.87	Low
HPAS	2.76	Low
HWPS	2.75	Low
CSFK	2.73	Low
CKIS	2.68	Low
HPPS	2.63	Low
WWKB	2.63	Low
WNAP	2.56	Low
WIAS	2.52	Low
WKSS	2.46	Low
WKAS	2.26	Low
WHAS	2.21	Low
NPAS	2.17	Low
WMIS	2.13	Low
HKPE	2.00	Low
LKAP	1.79	Low
HKPM	1.68	Low
WPAS	1.65	Low
HWES	1.60	Low
HMS	1.58	Low
CWES	1.54	Low
LNHS	1.28	Low
HKC	1.21	Low
WAUS	1.13	Low
LEGB	0.91	Low
HMMS	0.85	Low
HKG	0.77	Low
HKWS	0.69	Low
WASB	0.44	Low
LEGC	0.40	Low
WKES	0.28	Low
HADC	0.00	Low

Outfall	% Severe Inspections	Priority
LMAS	0.00	Low
LSHS	0.00	Low
NKIS	0.00	Low
NPOS	0.00	Low
NPUS	0.00	Low
NWDC	0.00	Low
WHIS	0.00	Low
WKEK	0.00	Low
WKHS	0.00	Low
WKSE	0.00	Low
WMLS	0.00	Low
WWOB	0.00	Low
LAS/LASS	--	N/A
LHS/LSH	--	N/A
LKCY	--	N/A
LKPA	--	N/A
LMBP	--	N/A
LMG/LKG	--	N/A
LPHM	--	N/A
WCMI	--	N/A

Table 5 - Catch Basin/Inlet Severe Inspections (FY16)

Outfall	% Severe Inspections	Priority
HKB	21.25	High
HKL	18.07	Medium
HAML	12.78	Medium
HKAS	10.44	Medium
HAWC	10.35	Medium
HHB	10.34	Medium
HEMB	9.52	Low
HAWH	8.82	Low
LWMB	8.16	Low
LWAS	7.05	Low
HSL/SLB	5.90	Low
LWUS	5.12	Low
HMAS	4	Low
LPHW	3.82	Low
CSFK	1.89	Low
WKIP	1.12	Low
WKAS	1.11	Low
CNFK	0	Low
WKEK	0	Low

1) Priority Criteria

Severe structures were assigned a priority rating depending on the percentage of severe structures located in the outfall.

- a) High >20% Severe Inspections
- b) Medium $10\% < X \leq 20\%$ Severe Inspections
- c) Low $\leq 10\%$ Severe Inspections

4.3 Criteria 3 - Industrial and Commercial Facilities

The location of industrial facilities in outfall areas was determined in order to determine the level of concentration of the facilities in each of the outfall areas. Higher concentrations of industrial facilities were located in Kalihi, Campbell and Mapunapuna areas. The results are indicated in Table 6 on the following page.

Table 6 - Location of Industrial Facilities

Area	#	Priority	Area	#	Priority
Aiea-Pearl City	17	Low	Kalihi	92	High
Airport	14	Low	Kaneohe	20	Low
Ala Moana	9	Low	Kapaa	3	Low
Campbell	67	High	Mapunapuna	65	High
Gentry	14	Low	Laie	1	Low
Halawa	36	Medium	Waialae	2	Low
Iwilei	47	Medium	Pearl City	20	Low
Kailua	3	Low	Wahiawa	18	Low
Kakaako	15	Low	Waipahu	29	Medium
Total			472		

*Reference: City and County of Honolulu, Department of Facilities Maintenance, Storm Water Quality, July 9, 2015.

1) Priority Criteria

The results of the industrial facility locations were determined and the outfall areas were assigned one of the following priority ratings:

- a) High >50 Industrial Facilities per Area
- b) Medium 25<X≤50 Industrial Facilities per Area
- c) Low ≤ 25 Industrial Facilities per Area

4.4 Criteria 4 - Previous Storm Water Violations

The database of notice of violations (NOVs) for illicit connections and illegal discharges were analyzed to determine the locations of the violations. The results are indicated in Table 7 below.

Table 7 - Number of Notice of Violations per Community

Community	#	Priority	Community	#	Priority
Central	30	Low	Makakilo-Kapolei	24	Low
East Honolulu	82	Medium	Moanalua-Aiea-Pearl City	64	Medium
Ewa Plain	28	Low	North Shore	20	Low
Hauula	2	Low	Urban Honolulu	354	High
Kailua	6	Low	Waipahu	40	Low
Kalaeloa Industrial	12	Low	Windward	72	Medium
Kalihi	2	Low	No Community Specified	234	N/A
Leeward	40	Low			
Total			1010		

* Reference: City and County of Honolulu, Department of Facilities Maintenance, Storm Water Quality, 7/8/15.

1) Priority Criteria

Based on the number of NOV's per Community, the following priority ratings were assigned:

- a) High >100 NOV's per Community
- b) Medium $60 < X \leq 100$ NOV's per Community
- c) Low ≤ 60 NOV's per Community

4.5 Criteria 5 - Areas Heavily Occupied by Homeless

Areas heavily occupied by the homeless were identified and assigned higher priority ratings over areas of lower concentrations of the homeless. Inspections in these areas will assist the City in monitoring and scheduling maintenance/cleaning of its MS4. The results are indicated in Table 8 below.

Table 8 - Number of Unsheltered Homeless by Region

Region	#	Priority
Downtown Honolulu	743	High
East Honolulu	367	Medium
Ewa	102	Low
Kaneohe to Waimanalo	145	Low
Wahiawa to North Shore	188	Low
Upper Windward	25	Low
Waianae Coast	369	Medium
Total	1939	

*Reference: State of Hawaii Homeless Point-in-Time Count 2015. The State of Hawaii, Department of Human Services, Homeless Programs Office

1) Priority Criteria

Based on the number of unsheltered homeless per Region, the following priority ratings were assigned.

- a) High >500 Unsheltered Homeless per Community
- b) Medium $200 < X \leq 500$ Unsheltered Homeless per Community
- c) Low ≤ 200 Unsheltered Homeless per Community

SECTION 5 - PRIORITY AREA INSPECTION SCHEDULE FOR FIELD SCREENING

The outfalls were assigned one of the priority ratings listed below based on the priority ranking criteria presented in Section 4. Priority ratings consist of a numeric value and descriptor as shown below.

1) Critical (4):

- a) Outfalls located in Total Maximum Daily Load (TMDL) areas designated by DOH, Waikiki, and Downtown-Chinatown. Waikiki areas include: Ala Wai Canal, Ala Wai Harbor, and Mamala (East) Bay. Downtown-Chinatown areas include: Nuuanu Stream, Kapalama Stream, and Honolulu Harbor. TMDL areas include: Ala Wai Canal, Kawa Stream, Waimanalo Stream, Kapaa Stream, Kaneohe Stream, North and South Forks of Upper Kaukonahua Stream.

2) High (3):

- a) Areas that have reached “high” threshold for at least one of the priority based ranking criteria.

3) Medium (2):

- a) Areas that have reached “medium” threshold for at least one of the criteria and have not reached the “high” threshold for any of the criteria.

4) Low (1):

- a) Areas that have not reached the “high” or “medium” threshold for any of the criteria.

5.1 Priority Schedule

A priority schedule for inspection, maintenance and cleaning of drainage structures was developed for the current permit period from FY16 to FY20 based on the outfall priority ratings. The following priority schedule shall be used for the outfall inspections. The priority schedule will be analyzed annually though the permit period and will be revised accordingly based on changes to priority ratings.

Table 9 – Outfall Priority Schedule

Outfall		Priority	Outfall		Priority
FY16 Priority Areas					
Airport Drainage Canal	HADC	High	Kawa Stream, East Branch	WKSE	Medium
Ala Wai Canal	HAWC	Critical	Kewalo Basin	HKB	High
Ala Wai Harbor	HAWH	Critical	Makiki Stream	HMIS	Critical
Honolulu Harbor	HHB	Critical	Mamala (West) Bay	LWMB	High
Halawa Stream, South Segment	LSHS	Medium	Manoa Stream	HMS	Critical
Halawa Stream, North Segment	LNHS	Medium	Moanalua Stream	HMAS	High
Kahawai Stream	WWKB	Critical	Nuuanu Stream	HNUS	Critical
Kanaka Stream	HKMS	Critical	Pacific Ocean off Barbers Point	LPBP	High
Kamooalii Stream	WKEK	Critical	Palolo Stream	HPMS	Critical
Kaneohe Stream	WKES	Critical	Pukele Stream	HPPS	Critical
Kapakahi Stream	LKWS	High	Waikele Stream	LWES	Medium
Kaukonahua Stream, North Fork	CNFK	Critical	Wailani Stream	LWIS	Medium
Kaukonahua Stream, South Fork	CSFK	Critical	Waimanalo Stream	WWAI	Critical
Kawa Stream	WKAS	Critical	Waiomao Stream	HWPS	Critical
FY17 Priority Areas					
Ala Moana Lagoon	HAML	High	Maile Stream	WCMS	High
Kaalaea Stream	WCAA	High	Makaha Stream	WCMA	High
Kahaluu Stream	WKUS	High	Manaiki (Moanalua) Stream	HMMS	High
Kahauiki (Moanalua) Stream	HKKI	High	Nanakuli Stream	WCNI	High
Kalihi Stream	HKIS	High	Pacific Ocean at Hauula	WPOH	High
Kamanaiki (Kalihi) Stream	HKKS	High	Pacific Ocean off Waianae	WCPO	High
Kapalama Stream, East Branch	HKAE	High	Pauoa (Nuuanu) Stream	HPNS	High
Kapuni Stream	WCKI	High	Salt Lake	HSL/SLB	High
Kawainui (Kaelepulu) Stream	WKWS	High	Ulehawa Stream, South Segment	WCUS	High
Kawiwa (Kaupuni) Stream	WCKK	High	Waikane Stream	WWAS	High
Keehi Lagoon	HKL	High	Waimanalo Stream	WWAI	Critical
LBPH	LBPH	High	Waiomao Stream	HWPS	Critical
LMBP	LMBP	High	Waiolani (Nuuanu) Stream	HWNS	High
FY18 Priority Areas					
Ahuimanu (Kahaluu) Stream	WAUS	Medium	Kaiwi Channel	HKC	Medium
Ahuimanu Stream South Branch	WASB	Medium	Kalauao Stream	LKAS	Medium
Aiea Stream	LAS/LASS	Medium	Kaluanui Ridge Gulch	HKG	Medium
Haiamoa Stream	WHIS	Medium	Kapakahi Stream	HKWS	Medium
Halawa Stream	LHS/LSH	Medium	Keaahala Stream, North Branch	WKHS	Medium
Heeia Stream	WHAS	Medium	Keaahala Stream, North Branch	WKNB	Medium
Honouliuli Stream	LHIS	Medium	Kuapa Pond East Segment	HKPE	Medium
Iolekaa (Heeia) Stream	WIAS	Medium	Kuapa Pond Middle Segment	HKPM	Medium
Kaelepulu Stream	WKIP	Medium	Kuapa Pond West Segment	HKPW	Medium
Kahaluu Stream Segment	WKSS	Medium	Kuliouou Stream	HKS	Medium
Kahanaiki (Maunawili) Stream	WKKI	Medium	Maililii Stream	WCMI	Medium
Kailua Bay	WKAB	Medium	Makaua Stream	WMAA	Medium
Kaipapau Stream	WKEB	Medium	Manana (Waiawa) Stream	LMAS	Medium
FY19 Priority Areas					
Maunalua Bay	HMB	Medium	Pearl Harbor, Middle Loch	LPHM	Medium
Maunawili Stream	WMIS	Medium	Pearl Harbor, West Loch	LPHW	Medium
Muliwaiolena Stream	WMAS	Medium	Pia Stream	HPAS	Medium
NHG	NHG	Medium	Puha Stream (Inoaole)	WPAS	Medium
NKG	NKG	Medium	Waialaenui Gulch	HWG	Medium
NPS	NPS	Medium	Waialaenui Stream	HWS	Medium
Nuuipa Pond	WNAP	Medium	Waiawa Stream	LWAS	Medium
Omao (Maunawili) Stream	WMIO	Medium	Waihee (Kahaluu) Stream	WWES	Medium
Oneawa Channel	WOAC	Medium	Waikele Stream	LWES	Medium
Pacific Ocean at Kaaawa	WPOK	Medium	Wailani Stream	LWIS	Medium
Pacific Ocean at Laiea	WPOL	Medium	Wailupe Stream	HWES	Medium
Panakauani Gulch	LPG	Medium	Waimalu Stream	LWUS	Medium
Pearl Harbor, East Loch	LPHE	Medium	Waimanalo Bay	WWOB	Medium
FY20 Priority Areas					
Waimano (Waiawa) Stream	LWOS	Medium	LKLC	LKLC	Low
West Beach Marina	LWBM	Medium	LKPA	LKPA	Low
WMLS	WMLS	Medium	LLG	LLG	Low
WPO	WPO	Medium	LOPM	LOPM	Low
Awanui Gulch	LAG	Low	Makakilo Gulch	LMG/LKG	Low
Kaunala Stream	NKAA	Low	NWDC	NWDC	Low
Kiikii Stream	NKIS	Low	Pacific Ocean off North Shore	NPNS	Low
Kipapa (Waikele) Stream	CKIS	Low	Paukauila Stream	NPAS	Low
LEGA	LEGA	Low	Paumalu Stream	NPUS	Low
LEGB	LEGB	Low	Poamoho (Kaukonahua) Stream	CPOS	Low
LEGC	LEGC	Low	Poamoho (Kaukonahua) Stream	NPOS	Low
LEWA	LEWA	Low	Waikakalua (Waikele) Stream	CWAS	Low
LKAP	LKAP	Low	Waikele Stream Segment	CWES	Low

SECTION 6 – FIELD INSPECTIONS PROCEDURES

The following flow chart shows the inspection procedures that are used during field outfall inspections.

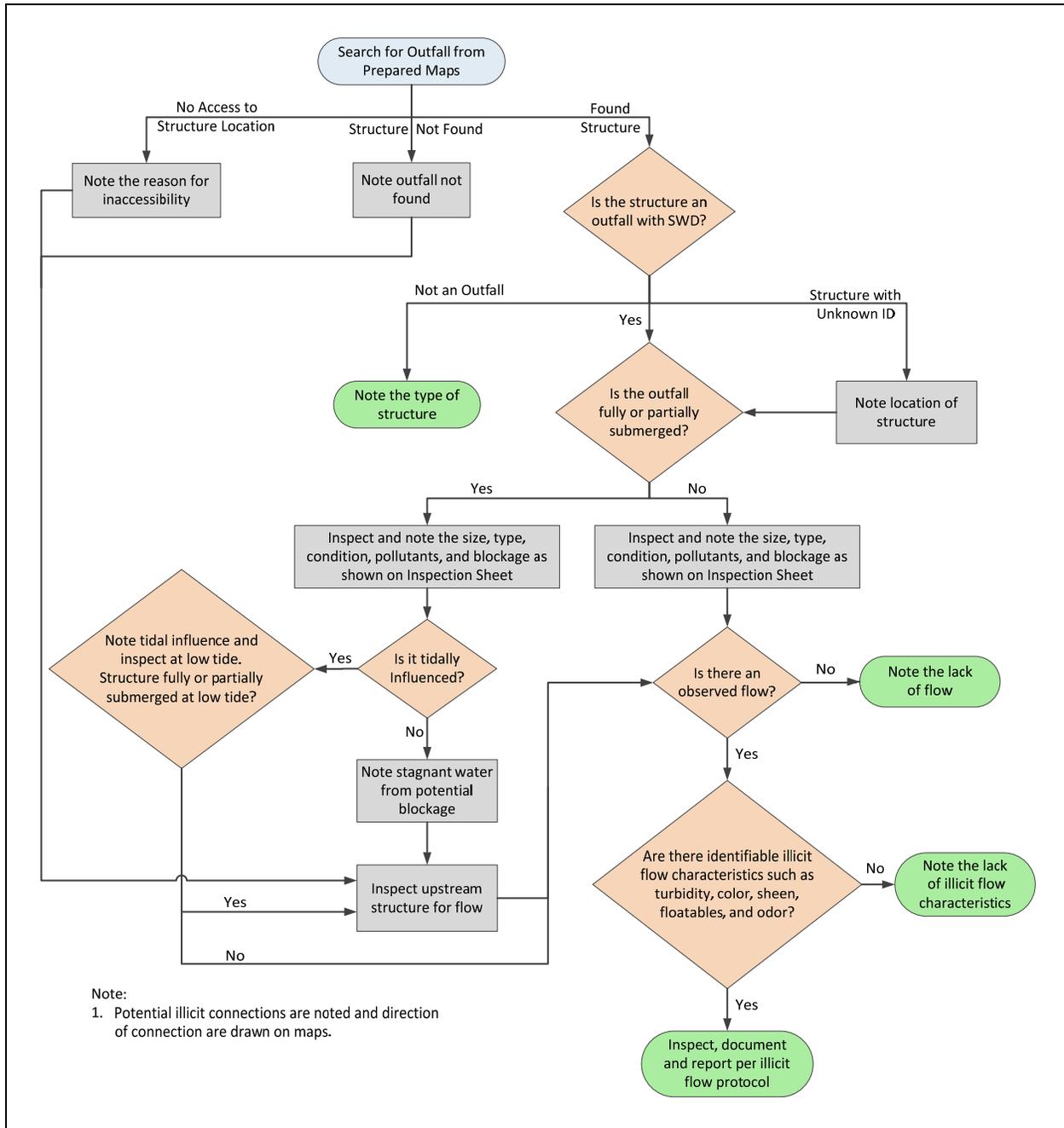


Figure 3 – Field Inspection Procedure Flow Chart

6.1 Inspection Areas

The Field Screening Plan inspections will target major (36" and larger) outfalls according to the priority schedule developed in table 9. Inspections include a visual assessment of the physical and environmental conditions at each site including erosion, flow, blockage and structural damage. An inspection form is completed along with supplemental photos of the storm water structure and relevant surrounding area.

6.2 Inaccessible Outfall Inspections

If access is required through a private property, a formal right of entry (ROE) letter will be given to the owner or manager requesting access for inspection. If conditions prevents outfall inspection (such as severe terrain), the outfall and reason for inaccessibility will be noted. Examples of difficult terrain include outfalls located on steep cliffs or outfalls releasing into the ocean with no beach access. An outfall inspection may not be able to be performed due to physical constraints or lack of right-of-entry. These outfalls will be analyzed and follow-up action such as obtaining ROE will be performed. If the outfall remains inaccessible, the upstream structure will be inspected for flow.

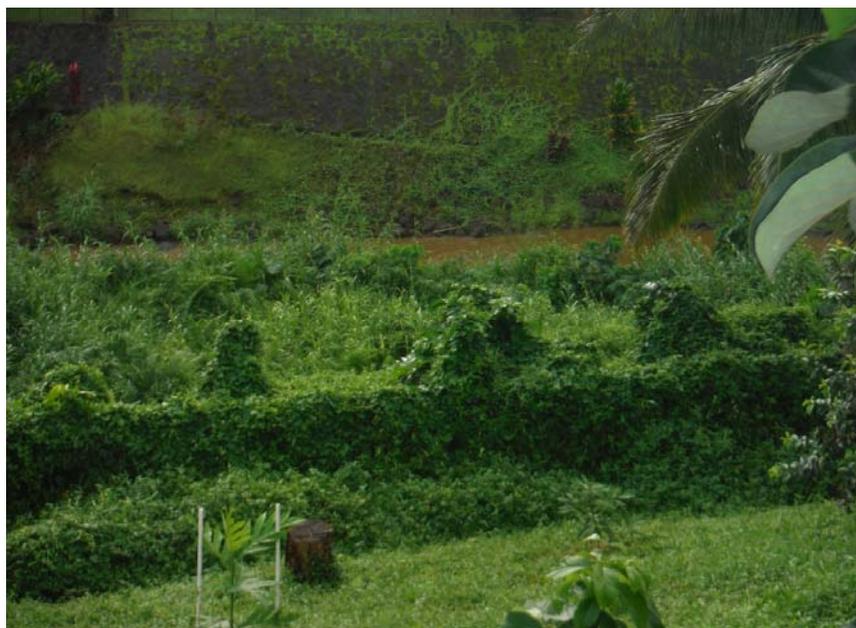


Figure 4 – Inaccessible outfall due to high fence at back of private property with dense vegetation.

6.3 Submerged Outfall

If the outfall is determined to be submerged, proceed to the nearest upstream structure identified on the system map that is outside the tidal influence and continue the inspection process. Up to 5 upstream manholes will be inspected in search for a structure outside the tidal influence. The upstream structures will only be inspected for flow, while other inspection information will be gathered at the outfall itself.



Figure 5 – Outfall is partially submerged at connection to ocean. Access is limited due to terrain and wave challenges.

6.4 Outfalls with Observed Flow

If flow is observed at an outfall, the flow will be inspected to identify characteristics such as color, sheen, turbidity, floatables, and odor. Record the inspected segment(s) of MS4 on the Field Screening Map, complete the Field Screening Inspection form and take all necessary photo documentation. The field inspections will also document allowable discharges. Examples of allowable discharges are as follows:

- Water line Flushing
- Landscape/lawn watering irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration
- Uncontaminated pumped ground water
- Discharges from potable water sources and foundation drains
- Air-conditioning condensate
- Springs
- Water from crawl space pumps and footing drains
- Water from individual residential car washing
- Water from charity car washes
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Exterior building wash water (water only)
- Residual street wash water (water only), including wash water from sidewalks, plazas, and driveways, but excluding parking lots
- Discharges or flows from firefighting activities



Figure 6 – A steady light flow is observed at the left outlet. This flow appears to be an allowable discharge.

6.5 Outfalls without Observed Flow

If no flow is observed, examine the outfall for indications of potential past illicit connections or illegal discharges. The outfall and surrounding areas may be stained, corroded, eroded, or cluttered with debris. Sedimentation or settled sludge may also be apparent as well as vegetative growth. Highlight the inspected segment(s) of MS4 on Field Screening Map, complete the Field Screening Inspection form, and take all necessary photo documentation of the outfall conditions.



Figure 7 – No flow observed at outfall connection to MS4.

6.6 Potential Illicit Flow

If any abnormal conditions relating to potential illegal discharges are seen, investigative efforts are made to trace the drainage system upstream to identify the location of the discharge and initiate appropriate investigative and enforcement actions. The inspection team will make reasonable efforts to locate the source. However, the investigation will terminate at private property or if conditions pose a potential safety concern. The inspector will document reasons for termination of the inspection process.

When the inspection team finds evidence of an illegal discharge and/or illicit drain connection, the following actions will be taken:

1. Inspect MS4 structures and adjacent properties upstream.
2. Photograph and document findings.
3. Complete the Investigation Form.
4. Document the address/location of the source of illegal discharges.
5. If the illicit discharge constitutes a matter of public safety, call 911.
6. If active illegal discharges are found, notify DFM-SWQ immediately.
7. If no surface flow is observed, the team will approximate the location of illegal discharge by investigating manholes with and without observable flow.
8. Submit all pertinent documentation (photos, forms and maps) to DFM-SWQ within 24 hours of screening.

Sections 3.4 Investigating Complaints and Tracking Illicit Discharges and 3.5 Enforcement of the Storm Water Management Program Plan (SWMPP) describe the investigation process as well as necessary enforcement procedures for when illegal discharges are identified.



Figure 8 – Potential petroleum/gas pollution detected visually and by odor.

6.7 Potential Illicit Connection

If a potential illicit connection is found, the inspector will note the size and type of pipe. The inspector will also note on maps the direction and property that the pipe is coming from in order to verify if the connection is or is not an illicit connection. The inspection team will photograph and document all findings.



Figure 9 – A potential PVC illicit connection is located at the outfall structure.

6.8 Structures with Unknown ID and Incorrect Classification

Structures found in the field that are not identified in the GIS provided by HoLIS will be inspected under the inspection protocol noted in Section 3. These structures will be noted with approximate location for addition to the HoLIS database. Similarly, structures that are not found or labeled incorrectly (e.g. a catch basin labeled as an outfall) will also be noted for correction to the database.

6.9 Outfalls Not Found

If the inspection team is unable to find an outfall based on the location provided by HoLIS, they will note that the outfall is not found for correction to the database. An outfall shall be considered not found if the inspection team cannot find the outfall in the immediate vicinity of the specified location provided by HoLIS. This is different from 3.2 Inaccessible Outfall Inspections where limited access and conditions can restrain the inspection team from nearing the outfall location.

If the outfall is not found, the upstream structure will be inspected for flow and information regarding the outfall location. Inspection team shall follow the direction of drain line to further assist the finding of the outfall. If the outfall is found in a location different than the HoLIS identified location, the correct location will be noted for correction to the database.

This page is intentionally left blank.

APPENDIX A

Sample Outfall Field Screening Map



This page is intentionally left blank.















This page is intentionally left blank.
