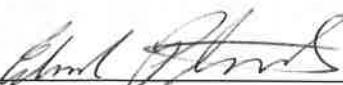
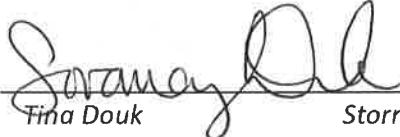


Standard Operating Procedures <i>Town of Dracut</i> <i>Department of Public Works</i> Water Quality Screening Approved by: The Stormwater Committee	SOP Number: 13	Issue Date: June 30, 2019	
 Edward Patenaude	<i>Public Works Director</i>	 Tina Douk	<i>Stormwater Manager</i>

Purpose

Outfalls from an engineered storm drain system can be in the form of pipes or ditches. Water quality parameters can be collected during dry weather and wet weather outfall inspections. Additional opportunity to collect water quality data can be conducted when catch basin inspection and cleanings are maintained.

This standard operating procedure addresses screening-level measurements than can be collected at outfalls, catch basins, receiving waters, or other water bodies. The measurements can be collected with field test kits or with portable meters.

Water quality screening data collected in this manner can feed into an illicit discharge detection and elimination investigation.

Visual Condition Assessment

In the standard operating procedures for dry weather outfall inspection, wet weather outfall inspection, and catch basin inspection and cleaning, a Visual Condition Assessment is described to collect observations related to the quality of stormwater conveyed by an engineered storm drain system. These observations may include such visual evidence and/or potential pollutants as:

- Foaming (detergents)
- Discoloration
- Evidence of sanitary waste
- Optical enhancers (fluorescent dyes added to laundry detergent); and
- Turbidity

If a Visual Condition Assessment indicates the presence of these pollutants, it may be necessary to quantify the extent of each, and gather data on other parameters that cannot be visually observed but can be measured using field kits or meters. These parameters include:

- Ammonia
- Chloride (present in treated drinking water but not groundwater)
- Conductivity
- Fluoride
- Hardness
- pH
- Potassium

Field Kits and Sampling Methods Available

The following table shows field test kits and portable meters that can be used for screening parameters.

Table SOP 13-1
Field Measurements, Test Kits, and Instrumentation

Analyte or Parameter	Instrumentation (Portable meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA
Bacteria		Hach™ Ammonia Test Strips Bacteria field test kits require 24-hour window
Boron	N/A	Hanna™ HI 38074 Taylor™ K-1541
Chloride	CHEMetrics™ V-2000 Colorimeter Hach™ Pocket Colorimeter™ II LaMotte™ DC1200 Colorimeter	CHEMetrics™ K-2002 through K-2070 Hach™ CDS-DT
Color		Hach™ Chloride QuanTab® Test Strips Hach™ ColorDisc
Conductivity	CHEMetrics™ I-1200	N/A
Detergents (Surfactants)	CHEMetrics™ I-2017 CHEMetrics™ V-2000 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Fluoride		N/A
Hardness	N/A	CHEMetrics™ K-1705 and K-1710 CHEMetrics™ K-4502 through K-4530 Hach™ HA-DT
Optical enhancers		Hach™ Hardness Test Strips Field tests still under development
pH	CHEMetrics™ I-1000	Hach™ 17J through 17N Hach™ pH Test Strips
Potassium	Horiba™ Cardy C-131	LaMotte™ 3138 KIW
Turbidity	CHEMetrics™ I-1300	N/A

Each field test kit will include instructions specific to that test kit, and most kits are available in configurations that detect different ranges of the parameter.

The table below shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table SOP 13-2
Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>50.0 mg/L
Conductivity	>2,000
Detergents (Surfactants)	> 0.25 mg/L
Fluoride	>0.25 mg/L
pH	<5
Potassium	>20 mg/L

If water quality screening samples exceed these benchmark concentrations, analytical samples should be collected for laboratory analysis.

Field test kits and portable instrumentation can be used as a screening tool. Field test kits can be used as an inexpensive method of field testing compared to a full analyses conducted at a laboratory. Portable instrumentation such as the colorimeters have the benefit of providing accurate readings, measure to low detection limits, and can be purchased pre-programmed to measure concentrations of most parameters required.

WATER QUALITY SCREENING FORM

Outfall I.D.			
Outfall Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular <input type="checkbox"/> Pre-Storm Event <input type="checkbox"/> During Storm Event <input type="checkbox"/> Post-Storm Event <input type="checkbox"/>			
Most Recent Storm Event			

FIELD WATER QUALITY SCREENING RESULTS

Sample Parameter	Field Test Kit or Portable Instrument Meter	Benchmark	Field Screening Result	Full Analytical Required?
Ammonia ¹		> 50.0 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Boron ¹		> 0.35 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Chloride ²		230 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Color ¹		> 500 units		<input type="checkbox"/> Yes <input type="checkbox"/> No
Specific Conductance ¹		> 2,000 μ S/cm		<input type="checkbox"/> Yes <input type="checkbox"/> No
Detergents & Surfactants ³		> 0.25 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Fluoride ³		> 0.25 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Hardness ¹		< 10 mg/L or > 2,000 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
pH ¹		< 5		<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium ¹		> 20 mg/L		<input type="checkbox"/> Yes <input type="checkbox"/> No
Turbidity ¹		> 1,000 NTU		<input type="checkbox"/> Yes <input type="checkbox"/> No

¹ – *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, Center for Watershed Protection and Robert Pitt of University of Alabama, 2004, p. 134, Table 45.

² – *Env-W's 1703.21 Water Quality Criteria for Toxic Substances*, State of New Hampshire Department Surface Water Quality Regulations.

³ – *Appendix I – Field Measurements, Benchmarks and Instrumentation*, Draft Massachusetts North Coastal Small MS4 General Permit, 2009.

FULL ANALYTICAL TESTING WATER QUALITY RESULTS

Sample Parameter	Analytical Test Method	Sample Collection (Time/Date)	Testing Lab	Analytical Testing Result
Ammonia	EPA 350.2/SM4500-NH3C			
Bacteria	E coli: 1103.1; 1603 Enterococcus: 1106.1; 1600			
Boron	EPA 212.3			
Chloride	EPA 9251			
Color	EPA 110.2			
Specific Conductance	SM 2510B			
Detergents & Surfactants	EPA 425.1/SM5540C			
Fluoride	EPA 300.0			
Hardness	EPA 130.1/SM 2340B			
Optical Enhancers	N/A*			
pH	EPA 150.1/SM 4500H			
Potassium	EPA 200.7			
Turbidity	SM 2130B			

*- There is presently no USEPA Standard Method for analysis of optical enhancers. Typically, sample pads are described as with "Present" or "Not Present" for fluorescing dye when exposed to UV light or a fluorometer.

