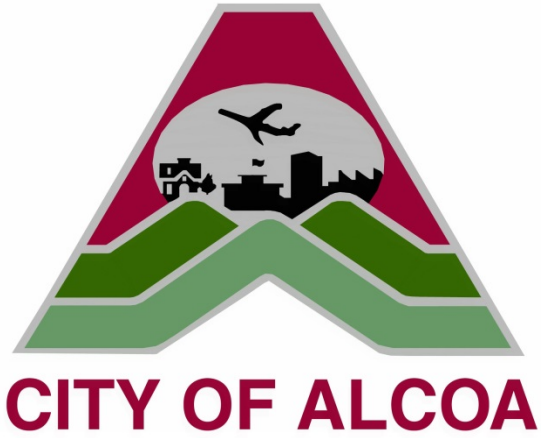
CITY OF ALCOA

Stormwater Program



Dry Screening

Standard Operating Procedure

September 2016

Updated 3/18/2024

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PURPOSE

The purpose of this document is to provide a Standard Operating Procedure (SOP) for dry weather field screening activities. Dry weather screening is part of the IDDE program that is required in our MS4.

INTRODUCTION

The City Of Alcoa Stormwater Management Program is required under its National Pollutant Discharge Elimination System (NPDES) Permit TNS075132 under Section 4.2.3 to "*develop and implement a plan to detect, identify and eliminate non-stromwater discharges including illegal disposal, to your system…develop and implement standard procedures to be followed to investigate portions of the MS4 that, based on the results of field screening or other identification programs, indicate a reasonable potential of containing illicit discharges or other sources of non-stormwater."*

This document will serve as a standard operation procedure (SOP) for activities associated with the dry screening program within the City Of Alcoa Stromwater Management Program area. The specific methods regarding the conducting of this ongoing program are defined within this document, for the current permit cycle. Any revisions to this document shall be recorded as "Revision" and be subject to appropriate peer review.

EMPLOYEE TRAINING, HEALTH, AND SAFETY

All employees involved in the dry screening program shall become familiar with the protocols outlined in this SOP. The field team shall have a working knowledge of the following:

- Outfall identification numbering
- Sample collection procedures, equipment cleaning, and equipment application for surface water collection\
- Sample record completion (i.e. chain of custody, labeling, etc.)
- Sample handling procedures
- Cartographic tools, Geographic Information Systems (GIS) technologies, and Geographic Positioning System (GPS) units

- Proper use of the HACH Storm Water Test Kit according to manufactures instructions
- Bacteriological, chemical, and biological analysis of data and possible sources of pollution if any is indicated
- Proper procedures regarding tracing events

The Program Manager, or designee, shall review this document to ensure continuing applicability and shall train employees with regards to proper monitoring protocols, as required.

Monitoring activity presents a variety of potentially hazardous situations. As a result of the innate hazard potential, special attention should be paid with regards to employee safety. General safety equipment and protocol shall include the following:

- First aid kit
- Latex gloves
- Flashlight
- Duct tape
- Emergency contacts
- Cell phone
- Disinfectant wipes
- Insect repellant
- Reflective safety vest
- Waders
- Drinking water

EQUIPMENT

The following equipment is needed to perform field screening:

- HACH Surface Water Test Kit or approved equal
- HACH Pocket Pro Conductivity Tester or approved equal
- Hach Pocket Pro pH and Temperature Tester
- Dry Screening Form or iPad
- Illicit Discharge Form or iPad
- Chain Of Custody Form for sample collection
- Sample Collection Bottles
- Tracing Dye
- Distilled Water
- Camera

- Maps
- Tape Measure
- Waste Disposal Bags
- Clipboard
- Backpack
- Gallon jug for test wastes

PROCEDURE

Frequency of inspections

Monitoring the outfalls in The City of Alcoa MS4 will be split into two sections, the Pistol Creek outfalls and the smaller streams outfalls. The inspections will be conducted in a yearly rotation to make efficient use of time and resources. (this section was added 6/4/2019)

When to Screen

Dry screening is to be carried out during dry weather conditions. Dry weather conditions are based on a period of 48-hours without any measurable rainfall. Dry screening sites must be investigated twice in a 24-hour period with a minimum of four hours between each inspection, so there must also be the time available to perform the two inspections in a single workday.

Where to Screen

Dry screening sites are determined by the outfall locations from storm drainage system that serve residential, urbanized, commercial and industrial areas. Generally, the initial location for dry screening is located at the downstream most outfall of the system or sub-basin. If a suspect illicit discharge is flowing from an outfall, an upstream investigation shall commence using the City storm system mapping and other tools. A map layout of the outfall to be investigated and the upstream drainage area shall be printed and used for locating the site and tracing any identified illicit discharges upstream as necessary.

Dry Screening Data Sheet/ Electronic Form in City Works

Once at the site, the dry screening data sheet (Appendix A) is to be completed. The data sheet is divided into the following Sections:

1. Background Data
    a. Outfall ID/ Water shed
    b. Date of screening/ Investigator(s) name

    c. Sample times
    d. *E. coli* collection
    e. Weather data/ days since last rain
    f. Drainage area land use
    g. Sample location narrative
2. Infrastructure Description
    a. Type, material, dimensions, and submerged status of the outfall
    b. Presents of flow
    c. Flow description
3. Chemical Characteristics
    a. Sample times
    b. Test results
4. Physical Flow Characteristics
    a. Presents of odor, color, turbidity, and floatables
    b. Description of the above parameters
    c. Relative Severity Index (RSI)
    d. Indicator Score (based on RSI)
5. Physical Characteristics of the outfall
    a. Presents of Indicators
    b. Description of Indicators
    c. Comments
6. Overall Outfall Characterization
7. Non-Illicit Discharge Concerns
8. Additional Comments/ Site Sketch

Section one of the sheets is to record site characteristics and investigator information. The "*E. coli* Collected" section is determined by the presence flow, physical conditions and results of pH, Conductivity, and temperature. The "Sample Location Narrative" box is for recording the site location information to allow for revisiting the site, and to identify changes that have taken place between investigations at the site. Photos of the site shall be taken to assist with documenting site details, and changes between visits (if any).

When inspecting an outfall, the presence of flow will determine if chemical and physical characteristics can be collected. If flow is not present, then only the physical characteristics of the outfall structure and location information need to be recorded. If the flow is present due to high ground water tables, springs, drainage from wetland areas or other naturally occurring water sources an assessment of physical characteristics, pH, conductivity, and temperature will be used to determine if additional sampling will be required.

Sample collection and Field tests

For sites with suspect flows, samples will need to be collected and used for onsite analysis and be collected for transport to the lab for chemical analysis. When collecting these samples, care must be taken to not introduce contaminants and to protect the field crew from exposure to pollutants. The following are things to consider when collecting samples in the field.

- Prior to sampling, calibrate the Hach Meters for pH and Conductivity according to manufactures directions.
- Make sure you have obtained sample bottles from the lab prior to dry screening.
- Wear surgical gloves when collecting samples, and wash hands with sanitary wipes after the samples are collected.
- Dry weather flows can be shallow, have low flow volumes, and be hard to reach. In some cases, alternative sample collectors may be used. A "dipper," consisting of a measuring cup at the end of a long pole, can be used to catch flows from an out fall. Other capture devices can be used when needed. No matter what is used, make sure not to disturb any sediments or benthic growth that may exist in the flow. Also, be sure to rinse any alternative collector three times with the sample water before collecting the sample.
- For *e-coli* samples fill the bottle to the line, but not over the line. These bottles have preservatives added to them.
- Do not touch the inside of the lids or bottles.
- Label the bottles and fill out a chain of custody to go with the sample to the lab. Chain of custodies are kept with the sample bottles provided by the lab.

The physical parameters of the discharge are measured using the proper meter included in the HACH Surface Water Test Kit and the HACH Pocket Pro Conductivity Tester. Duplicate measurements should be taken for the parameters measured by these devices. In between measurements, the instrument is removed from the sample and the probe is rinsed with distilled water. This ensures the meters are functioning properly when the two readings are similar. If meters fail to be consistent in the duplicate tests, an "n" is placed beside the appropriate chemical parameter section on the field sheet.

The collected samples will be delivered to the lab of choice with completed chain of custody. If the results from the chemical analysis indicate an illicit discharge, then a tracing event must take place (Water quality test parameters, along with their possible source indicators are shown in Table 1). The tracing event involves using the GIS map associated with that outfall to search

upstream of the outfall point to locate the source of the positive concentration of the chemical parameter and detect if the source is an illicit discharge. If an illicit discharge is found, an Illicit Discharge Report is completed and submitted to the Program Manager. Any unusual measurements from the meters or test kits are noted in the comments box in section three of the field sheet (Appendix A). Visual assessment of the site is made and any physical characteristics of the flow or the outfall are recorded in sections 4 and 5, respectively, of the field sheet.

Table 1. *Water Quality Test Parameters and Source Indicators*

Water Quality Test Parameter	Use of Water Quality Test	Possible Source
Nitrate	3 to 10mg/L and greater is suspect of an illicit discharge	Failing sewer line, pet or farm animal waste, industrial discharges
Conductivity	>1000uS/cm is suspect of an illicit discharge	Industrial discharges, failing sewage lines,
Ammonia	0.2 to 1.0mg/L and greater is suspect of an illicit discharge	Fertilizers, failing sewer lines, industrial discharges
Phosphorous	1.5 to 5mg/L and greater is suspect of an illicit discharge	Disturbed land areas, commercial cleaning preparations, fertilizers, failing sewer lines
Chlorine	The presents of Chlorine indicate treated water entering the storm water	Failing water lines, swimming pools, irrigation
Dissolved Oxygen	<3mg/L indicates nutrients entering the storm water and/or increased temperatures	Fertilizers, failing sewer lines, disturbed land areas

When all measurements have been taken, the overall outfall characterization is determined by assessing the likelihood of the presence of an illicit discharge. If less than two indicators are present, then the characterization is “unlikely”. A characterization of “potential” is given if there

are two or more indicators present. If there are one or more indicator(s) with a severity of three (from section four and five of the field sheet), then a characterization of “suspect” is given to the outfall point location. If the measurements clearly indicate an illicit discharge, the outfall is characterized as “obvious”.

Concerns not associated with illicit discharges are noted in section seven of the field sheet (Appendix A.) Section eight is used for additional comments and site sketches. If an Illicit Discharge Form is necessary, it should be noted in section eight.

Office Work

Office work will depend on the method used for logging the data. If the Dry Screening Data Sheets (paper forms) are used, they shall be given to the Program Manager or Designee for verification upon returning to the office. Field sheets and site photos shall be scanned and entered into City Works. Hard copies shall be kept in folders created for each site.

If data is logged into City Works while in the field, a summary of each site shall be created and filled in the hard copy files for each site. In both cases, any GIS updates shall be carried out by the GIS Coordinator.