Appendix D

- Salt Lake County IDDE Plan
- Salt Lake County MOU with Health Department

SALT LAKE COUNTY

Illicit Discharge Detection and Elimination Plan

Contents

1 INTRODUCTION

In February 2020, the Utah Pollutant Discharge Elimination System (UPDES) Permit No. UTS000001 (Permit) was issued to the Jordan Valley Municipalities. The municipalities covered by the Permit include Salt Lake County. Salt Lake County (SLCo, the County) owns over 180 facilities including a working farm, golf courses, parks, trailheads, libraries, theatres, senior centers, event centers, and a planetarium. Historically Salt Lake County was the largest provider of municipal services in Utah, with a population reaching 250,000. As communities grew and incorporated into cities, they annexed commercial tax areas from the remaining unincorporated communities, making it difficult for the County to fund municipal services.

The County Council created the Municipal Services District (MSD) to retain the remaining tax base and made the MSD an “independent special district under Utah law” that provides municipal services to its member communities. The inception of the Municipal Services District (MSD) transferred the population and stormwater infrastructure of Unincorporated SLCo to the MSD. This transfer reduced the County Permit requirements and applied to the remaining “County-owned” facilities only.

The Permit covers municipal stormwater discharges and requires the development of an Illicit Detection and Discharge Elimination plan (IDDE). A component of the IDDE plan is field screening, and the MSD, a co-permittee, currently administers field screening of outfalls and open spaces located in the Townships, Cities, and Unincorporated areas in Salt Lake County. Salt Lake County field screens County-owned parks and open spaces along with a single outfall located at Wheeler Farm. The IDDE plan outlines techniques to find, fix, and prevent illicit discharges. The IDDE Plan includes public education and participation facilitated through the Salt Lake County Stormwater Coalition.

A memorandum of understanding (MOU) between Salt Lake County Flood Control and Engineering and the Salt Lake County Health Department (Health Department) outlines the expectations and roles of each department regarding stormwater investigations and enforcement actions.

2 IDDE PLAN BASIS

Municipal Separate Storm Sewer Systems (MS4s) stormwater discharges often include wastes and wastewater from non-stormwater sources that enter the stormwater system. The Permit defines illicit discharge as any discharge to an MS4 that is not composed entirely of stormwater, except those discharges authorized under the National Pollutant Discharge Elimination System (NPDES) Permit. These non-stormwater sources are untreated discharges that can contribute high levels of pollutants, including heavy metals, oil and grease, solvents, nutrients, viruses, and bacteria to the receiving water bodies. EPA studies have shown that pollutant levels from illicit discharges can be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

This document provides the framework for the IDDE plan that requires a current storm system map of the MS4, an Ordinance (Appendix B), and a written plan to detect and address non-stormwater discharges (Permit sections 4.2.3.1- 4.2.3.3). The required standard operating procedures (SOPs) (Permit sections 4.2.3.5 & 4.2.3.6) and sample inspection reports (Permit sections 4.2.3.5.1) are included in the appendices of this document.

Illicit discharge field screening of priority County Municipal facilities is conducted annually (Permit section 3.2.2.2.2.). Field screening investigations aid in identifying specific pollutant sources. This screening plan includes the corrective actions to reduce or eliminate pollutant sources identified through field screening.

Currently, the MSD MS4 monitors and services the outfalls located in the Cities, Townships, and Unincorporated areas that were previously maintained by Salt Lake County. All metro SLCo area outfalls, pipes, and storm sewer systems were transferred to the MSD when it began operation in 2016. The MSD services the stormwater infrastructure through various contracts and performs IDDE field screening for the outfalls. Currently, the SLCo MS4 IDDE plan focuses on the priority parks and open spaces requiring annual screening for illicit discharges and E. coli per the Jordan River Watershed E. coli TMDL Report (Report) and Permit updates and a single outfall located at Wheeler Farm.

The Permit requires a database for mapping, tracking, and inspections conducted with the IDDE plan (Permit section 4.2.3.10). Currently, SLCo utilizes Survey123 to track inspections and illicit discharge calls in addition to the records kept by the Health Department. Annual training for employees who might encounter an illicit discharge as part of their normal job duties (Permit section 4.2.3.11) is facilitated through Human Resources using the SABA training program.

3 ILLICIT DISCHARGES

Illicit discharges are "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges under a UPDES Permit (other than the UPDES Permit for discharges from the municipal separate storm sewer) or waters of the state." Illicit discharges carry pollutants in the untreated water and empty directly into a river, lake, or stream through pipes, outfalls, ditches, or open spaces adjacent to the water bodies. Illicit discharges include illegal dumping, illicit connections, seepage, and spills of:

- Septic tank / illegal sanitary connections
- Hazardous chemicals
- Oil/auto fluids
- Home improvement waste (e.g., concrete, paint)
- Pesticides and fertilizers
- Commercial and industrial waste
- Cooking grease/household waste
- Pet waste / human waste

3.1 Emergency Spill Response

Citizen Reporting Hotline

The Permit requires MS4s to develop a plan for citizen reporting of illicit discharges (Permit section 4.2.3.9). SLCo publicizes the Health Department's Environmental Health Emergency Response number which was established as part of the MOU with local agencies to have a centralized reporting number for reporting spills and other illicit discharges. Common responses include:

- Fuels and oil spills
- Pesticides/herbicides/detergents
- Concrete washout spills
- Grease interceptor overflows
- Abandoned drums
- Commercial dumping in storm drains or waterways
- Public dumping in storm drains or waterways

SLCo has written procedures for spill response, investigation, notifications, removing spills, and enforcement actions.

The appropriate MS4, the Salt Lake County Health Department (801-580-6681), and the Utah Department of Environmental Quality (801-536-4123) are notified as required of the Reporting and Response Flow Chart (Figure 1).

Containment Procedure

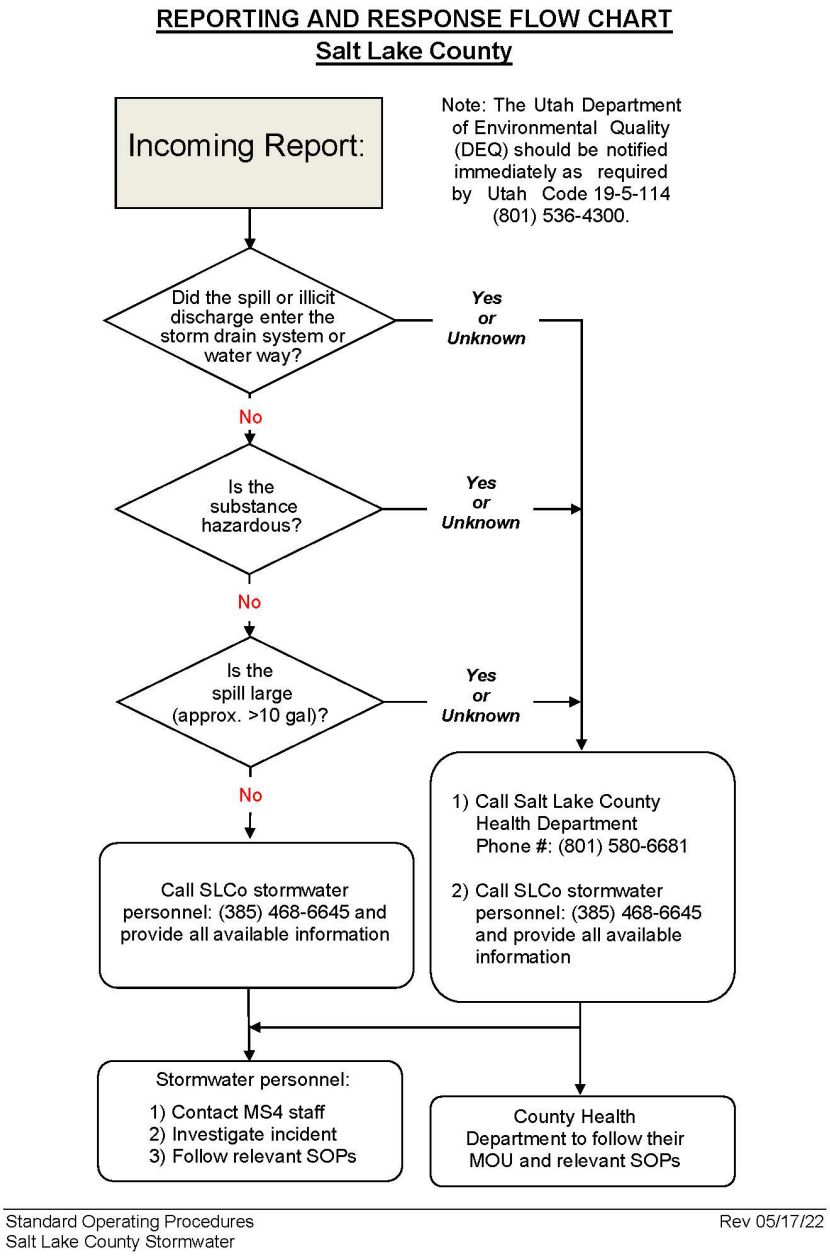
Immediately make efforts to stop or contain the discharge if possible.

1. Use appropriate personal protection equipment.
2. The general spill containment procedure is the following (when safe to do so):
    a. Stop the source of the spill.
    b. Cover storm drain inlets, manholes, and outfalls as needed.
    c. Contain any spilled material using spill kits or other available materials.
    d. Surround the perimeter of the spill with absorbent pads/rolls, berms, etc.
    e. Take any further action directed by the SLCo Health Department or DEQ.

Tracing Unknown Source:

1. Visually inspect inlets, pipes, and outfalls upstream of the discharge area for possible pollutants.
2. Use GIS software to trace the path of manholes back to the potential source.
3. Open the manhole and visually check for physical parameters:
    a. flow
    b. colors
    c. odors
    d. floatable materials
    e. deposits or stains
4. Investigate manholes closest to the outfall first and move up the sewer network until the source is identified or isolated between two manholes.
    a. If the source is apparent, assist the SLCo Health Department in collecting water samples (when appropriate), enforcement actions, and cleanup procedures.
    b. If the source is not apparent, collect field parameters as an indicator of the discharge source. Refer to the parameter table to check potential sources based on concentrations.
5. If the above efforts fail to identify the source, revisit the site the next business day to determine whether repeat visits are required or if the discharge was a one-time event.

FIGURE 1: REPORTING AND RESPONSE FLOW CHART



3.2 County Outfalls and Open Spaces

An outfall is a point where untreated stormwater from the MS4 empties directly into a river, lake, or stream. The field screening protocol is performed only at outfalls greater than 12 inches in diameter. Dry weather screening is conducted on a single outfall that discharges from Wheeler Farm into Little Cottonwood Creek.

Most of the County's screening for illicit discharges focuses on E. coli discharges in open spaces like parks, dog parks, golf courses, and trailheads. The Permit identifies priority areas that are more likely to have illicit discharges (Permit section 4.2.3.3.1):

3.3 Land Use

Residential, commercial, industrial, and municipal land uses help predict the potential for illicit discharges (Table 1). The most common illicit discharges result from infiltrating sewage, illegal dumping and connections, spills and leaks, and process waters.

Table 1. Land Uses, Generating Sites, and Activities That Produce Indirect Discharges

Land Use	Generating Site	Activity that Produces Discharge
Residential	• Apartments • Multi-family • Single Family Detached	• Car Washing • Driveway Cleaning • Dumping/Spills (e.g., leaf litter and RV/boat holding tank effluent) • Equipment Washdowns • Lawn/Landscape Watering • Septic System Maintenance • Swimming Pool Discharges
Commercial	• Campgrounds/RV parks • Car Dealers/Rental Car Companies • Car Washes • Commercial Laundry/Dry Cleaning • Gas Stations/Auto Repair Shops • Marinas • Nurseries and Garden Centers • Oil Change Shops • Restaurants • Swimming Pools	• Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing • Washdown of greasy equipment and grease traps
Industrial	• Auto recyclers • Beverages and brewing • Construction vehicle washouts • Distribution centers • Food processing • Garbage truck washouts • Marinas, boat building and repair • Metal plating operations • Paper and wood products • Petroleum storage and refining • Printing	• All commercial activities • Industrial process water or rinse water • Loading and un-loading area washdowns • Outdoor material storage (fluids)
Institutional	• Cemeteries • Churches • Corporate Campuses • Hospitals • Schools and Universities	• Building Maintenance (e.g., power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Parking Lot Maintenance (power washing) • Vehicle Washing
Municipal	• Airports • Landfills • Maintenance Depots • Municipal Fleet Storage Areas • Ports • Public Works Yards • Streets and Highways	• Building Maintenance (power washing) • Dumping/Spills • Landscaping/Grounds Care (irrigation) • Outdoor Fluid Storage • Parking Lot Maintenance (power washing) • Road Maintenance • Spill Prevention/Response • Vehicle Fueling • Vehicle Maintenance/Repair • Vehicle Washing

3.4 Municipal Facilities

SLCo keeps a current inventory of County-owned facilities and updates the list annually. The Permit requires that areas with potential sources of E. coli are inventoried and added to the IDDE priority areas that are likely to have an illicit discharge.

IDDE *Priority* Municipal Sites

SLCo has recently added areas specified in the TMDL report to the list of priority areas that are inspected annually as part of the IDDE plan (Permit Section 3.2.2.2.2). The IDDE plan includes field screening that focuses on identifying E. coli discharges in open spaces such as parks, dog parks, golf courses, and trailheads that are near sensitive water bodies. The permit specifies priority areas that are more likely to have illicit discharges (Permit Section 4.2.3.3.1):

- Areas with older infrastructure
- Industrial, commercial, or mixed-use areas
- Areas with a history of illicit discharges
- Areas with a history of illegal dumping
- Areas with older sewer systems and cross-connections
- Areas upstream of sensitive water bodies
- Areas determined likely to have illicit discharges.

Table 2. County Priority Municipal Sites

Big Cottonwood Park	Bingham Creek Regional Park	Pioneer Crossing Regional Park	Crestwood Park	Decker Lake Park
Dimple Dell Park	Evergreen Park	Sugarhouse Park	Wheadon Farm	Wheeler Farm
Millrace Park	Valley Regional Park	Constitution Park	Scott Avenue Park	JRT Sp View Farm
Yellow Fork Canyon Trailhead	JRT 4800 S	JRT Arrow	JRT Holm	JRT Little Confluence
JRT Loop	Mountain View Golf Course	Old Mill Golf Course	Riverbend Golf Course	South Mountain Golf Course
Meadow Brook Golf Course	Mick Riley Golf Course	Wheeler Farm Outfall (Lit 04.03)		

These sites were identified by Salt Lake County as priority sites based on the Permit criteria above. These sites are inspected and recorded annually (Permit Section 3.2.2.2.2) during IDDE dry weather field screening for the County, usually in the Autumn months. The inventory and map are updated to reflect changing priorities with each inspection cycle (Permit Section 3.2.2.2). These inspections are performed by the SLCo stormwater team and use Survey123 to generate inspection data.

SLCo High-Priority Facilities

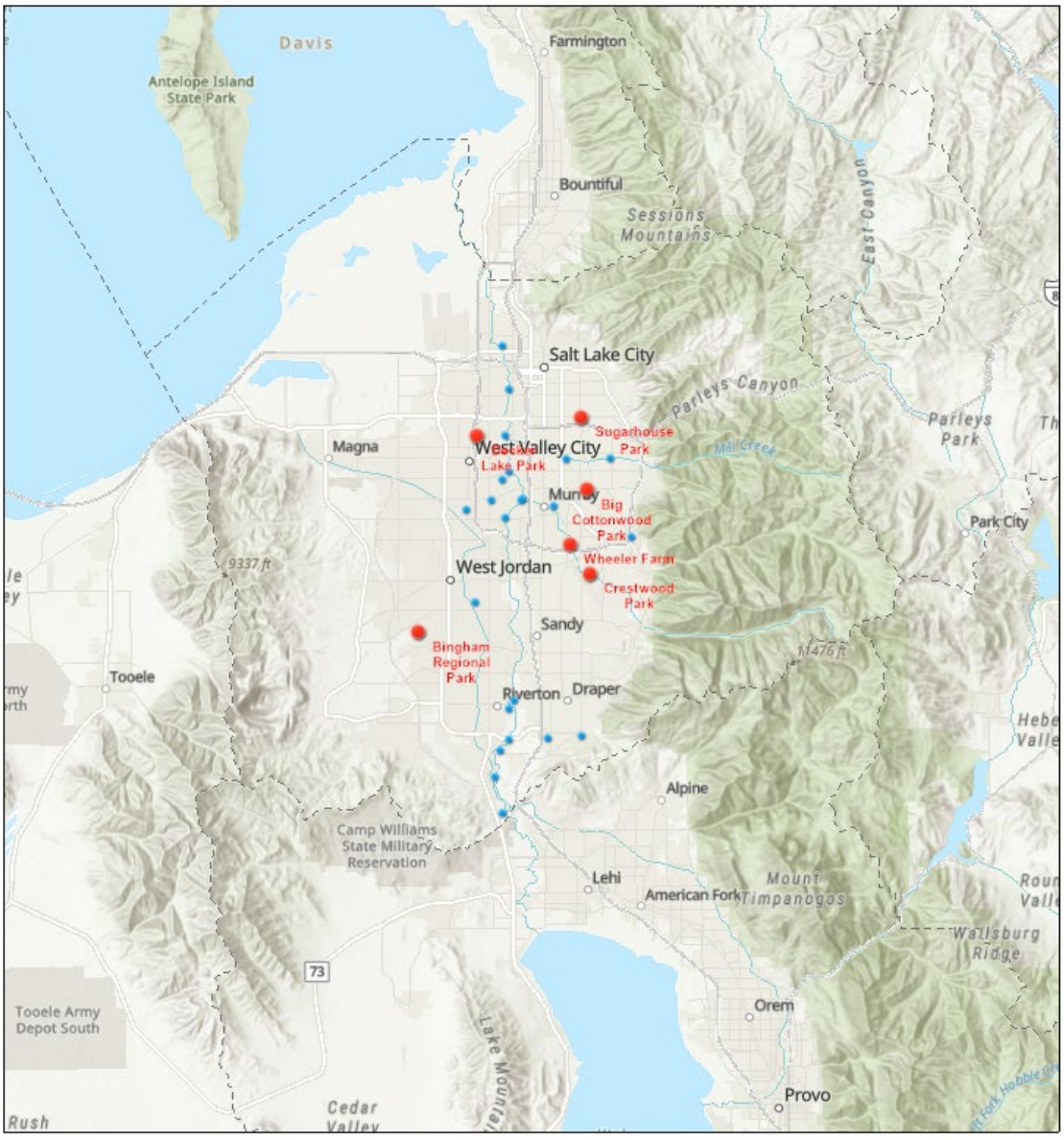
The Permit requires the priority list of MS4-owned and operated facilities with the potential to discharge E. coli to waterways (e.g., dog parks, sites with septic, parks with open water, etc.). Sites with an increased risk of E. coli discharges, especially to waterways, are placed on the high-priority list. High-priority sites are required to have structural and/or non-structural BMPs implemented (Permit section 3.2.2.3) and a SWPPP that outlines the BMPs selected to prevent pollutants from entering waterways. The high-priority site inventory and map are updated regularly to reflect changing priorities.

Inspections of high-priority sites include monthly visual inspections (Permit section 4.2.6.5.1), semi-annual comprehensive inspections (Permit section 4.2.6.5.2), and annual visual observations of stormwater discharges (Permit Section 4.2.6.5.3). These inspections are performed by the Departments that oversee site activities or by the SLCo stormwater team depending on the locations. These inspections use both paper and electronic documentation to accommodate the widely variable access to technology for each department within the County.

Table 3. County High-Priority Municipal Sites

Big Cottonwood Regional	Sugarhouse Park	Crestwood Park
Bingham Regional Park	Decker Lake Park	Wheeler Farm

FIGURE 2. PRIORITY AND HIGH PRIORITY E. COLI SITES



4 IDDE Dry Weather Screening Procedures

4.1 Dry Weather Screening

Dry weather screening is a field test method for inspecting dry stormwater areas to locate and identify harmful and illegal discharges. It can also identify improper connections to a municipal stormwater system. This method uses visual observations with simple water quality analysis to detect potential illicit discharges and trace them to their origin.

4.2 Weather Conditions

Optimal conditions for IDDE dry weather screening are prolonged dry periods during the nongrowing season with low groundwater levels. Screening fieldwork is conducted at least 48 hours after the last runoff-producing rain or snowmelt event. Evaluate weather conditions to determine that a storm event is not in the forecast during screening activities. Table 2. provides the preferred weather conditions.

Table 4. Preferred Climate/Weather Consideration for Dry Weather Screening

Preferred Condition	Rationale	Notes/Regional Factors
Low groundwater	High groundwater can confuse results	Avoid screening in spring when the ground is saturated from snowmelt.
No runoff producing rainfall in 48 hours	Reduces influence of stormwater	The time frame may vary depending on the drainage system.
Dry season	Allows for more days of fieldwork	Only applies to regions with wet/dry seasons.

Source: Center for Watershed Protection, 2004

4.3 Outfall Screening

Outfall inspections can be used as a field screening methodology to identify illicit discharges when the flow is present or when visual, olfactory, or other indicators (for example, a greasy film) are observed. Outfall inspections are best conducted during dry weather and periods of low groundwater flow, generally at least 48 to 72 hours following the last runoff-producing rainfall event. If outfalls still have flow during dry weather, the flow should be investigated further to determine if the source is groundwater inflow to the storm drainage system or an illicit discharge or illicit connection.

4.4 Field Screening

Inspections of ditches, swales, and open spaces use the dry weather field screening methodology to help identify illicit discharges in areas with no piped stormwater conveyance systems. These open spaces can convey stormwater flows carrying potential illicit discharges. Identify ditches and open spaces that convey natural flow using flow patterns and historical drainage patterns. An area that flows during storm events that was designed to carry stormwater or discharge water is not a ditch that conveys natural flow. A historic stream area is likely to convey natural flows. Standing or flowing water

should be checked for evidence of color, odor, turbidity, and visual indicators. Check the condition of an area for visual indicators like deposits and staining, structural damage, and vegetation.

4.5 SCHEDULE

Priority sites are inspected annually (Permit section 3.2.2.2.2) using IDDE dry weather field screening methods, typically during the Autumn months, and the inventory and map are updated to reflect changing priorities (Permit section 3.2.2.2).

4.6 DISCHARGE FREQUENCY

It is important to note the frequency of dry weather discharges in storm drains and open spaces. The discharge frequency is classified as continuous, intermittent, or transitory.

Transitory illicit discharges are typically one-time events such as spills, sewer breaks, or illegal dumping. These discharges can negatively affect water quality in receiving waters. Transitory discharges are the most difficult to investigate and trace back to the source.

Intermittent illicit discharges are occasional or periodic discharges that occur over a few hours per day or a few days per year. These discharges are hard to detect and typically happen as the result of line breaks or cross-connections.

Continuous illicit discharges are discharges that are endless or without pause. Continuous discharges can create direct connections into the MS4 from sanitary sewers, cross-connections, industrial infrastructure problems, or malfunctioning household septic tanks. This type of discharge is the easiest to find, investigate, trace, and eliminate from the MS4.

This plan prioritizes the detection and elimination of continuous and intermittent illicit discharges to the MS4. An investigation uses various techniques to detect and trace discharges upstream to find the offending generating site or connection.

5 MOBILIZATION

When there are optimal weather conditions, sampling teams will mobilize and prepare equipment for outfall and open space screening. Screening is performed after three days of dry weather. It is more likely that water flowing during dry weather is due to an illicit discharge. Preparation includes the following:

- Determine areas for screening and locate them using GPS/maps (Figure 2)
- Review field data sheets from previous screening(s) when available
- Review Health & Safety Guidelines (Appendix E)
- Gather field sampling equipment and digital Field Data Sheets (Appendix D)

5.1 Field Screening Procedures

A series of qualitative field observations and field analyses of selected water quality parameters are the field screening portion of dry weather monitoring. General site observations like weather conditions, outfall type/material, and conditions are recorded on the Field Data Sheet (Appendix D) which has been adapted into an optional Survey123™ digital field form.

Screening data are entered in the field except when the online sheets are unavailable. If there is no flow observed, the screening of the open space is complete after filling out the appropriate Survey123™ IDDE Parks Annual Screening Form (Appendix F). When flow is observed, field personnel will conduct additional screening activities to locate the origin of the flow using the Survey123 Dry Weather Screening Survey.

When dry weather flows are present at an outfall or in an open space, the flow is not considered stormwater-related. However, this flow is not always an illicit discharge, and it may fall under allowable discharges as defined in the Permit (Permit section 1.2.2.2):

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensate
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering runoff
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Residual street wash water
- Dechlorinated water reservoir discharges
- Discharges or flows from emergency firefighting activity

E. coli-related indicators for open space inspections include:

- Visible evidence of pet waste upgradient at the discharge point
- Visible evidence of waterfowl activity or waste upgradient of the discharge point
- Domestic pet waste containers improperly contained
- Sediment or debris build-up in gutters or catch basins
- Evidence of sanitary waste (i.e., odor, debris, or staining)

- Dry weather discharge

When dry weather flow is present field screening activities include:

- Note time, weather conditions
- Determine land use in the area (Table 1)
- Perform a visual inspection of the area, looking for evidence of pollutants or illicit discharges (e.g., staining or discoloration)
- Determine the flow rate (Appendix H)
- Record water quality parameters (i.e., temperature, pH, conductivity, and turbidity)
- Record physical indicators (i.e., odor, color, floatable material)
- Determine if water samples for lab analysis are required
- Collect a grab sample for various pollutants such as nitrates (ammonia), phosphates (detergents), chlorides (chlorine)
- If there is evidence of pollutants or an illicit discharge, call the Environmental Health Emergency Response number: (801) 580-6680

5.2 Quantitative Characterization

Field measurements and observations help identify the source of the dry weather flow and are used to supplement laboratory analysis. In most cases, dry weather discharges are several source flows (e.g., potable water, groundwater, sanitary wastewater, car wash waters). Certain water quality parameters can indicate the presence or absence of a specific type of discharge. Some parameters can be measured in situ with field probes, testing strips, and meters, while others need lab analysis. Quantitative characterizations included in the Field Data Sheet are flow rate and water quality screening.

Flow Rate is measured using either (Appendix H):

- the time to fill a container of a known volume
- the flow velocity measured with an estimated cross-sectional area

Water quality screening measures the water quality of the flow using field test equipment for the following indicators (Appendix I):

- pH
- Conductivity
- Dissolved Oxygen (DO)
- Temperature
- Turbidity
- Chlorine & Ammonia

5.3 Physical Indicators

Sensory indicators detect by smell or sight and require no field equipment to detect the most severe or obvious discharges. Check for these indicators where flow is present. Record the severity on a scale of one to three on the field data sheet. If these field measurements do not identify the potential source of discharge, additional analysis may be necessary.

- Odor
- Color
- Floatable Matter

Physical indicators are very useful in determining the significance of contaminated dry weather flows. These physical conditions indicate that an intermittent or transitory discharge has occurred, even if there is current flow. These indicators provide clues about the discharge history of an area. Note the following characteristics for flowing and non-flowing outfalls and open spaces:

- Structure Damage
- Deposits & Stains
- Pipe Benthic Growth
- Poor Pool Quality
- Vegetation

6 LABORATORY ANALYSIS

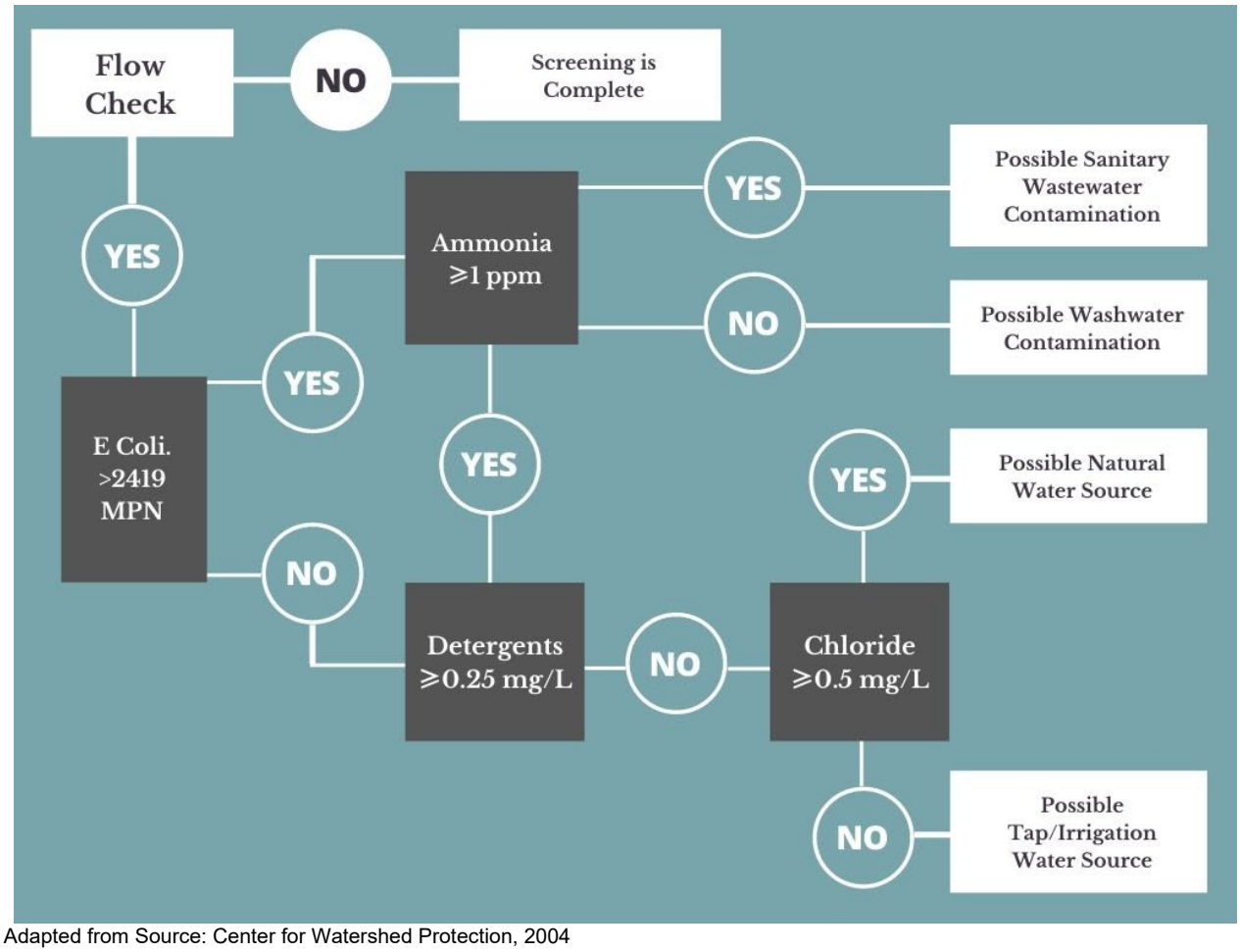
If the field measurements indicate an illicit discharge and the potential source is undetectable, the field crew may determine that lab analyses are necessary. Proper water quality sampling is conducted according to EPA Title 40 CFR 136, and the grab sample procedures are summarized in Appendix K. Potential field sampling parameters are:

- Ammonia
- Color
- Detergents
- Chloride
- E. coli/Total Coliform
- Fluoride
- Hardness
- Potassium

The flow chart in Figure 3 identifies the sequencing of the sampling. Contact the appropriate agency following the determination of the likely pollutant source. If the results from testing the chemical parameters are within the normal range, and none of the physical parameters are distressed, the outfall or open space needs no further investigation. If the screening results indicate a likely source, SLCo Engineering and Health Department will conduct further investigations.

Use the indicator parameters in Table 5 when land use is determined to be industrial or commercial. Industrial and commercial generating sites produce discharges that are often not composed of either sewage or wash water. Examples include industrial process water or wash-down water conveyed from a floor drain to the storm drain system. This guidance identifies seven field indicator parameters that serve as industrial flow benchmarks to help identify illicit discharges originating from industrial and other generating sites. The seven indicators: ammonia, dissolved oxygen, turbidity, conductivity, pH, temperature, and chlorine identify liquid wastes and other industrial discharges that are not always evident in the Flow Chart Method.

FIGURE 3. FLOW CHART FOR POTENTIAL POLLUTION SOURCES



Adapted from Source: Center for Watershed Protection, 2004

Table 5. Parameter Checklist for Potential Commercial/Industrial Flows

Parameter	Benchmark Concentration	Notes
Ammonia (as Nitrogen)	≥1 ppm	• pH and temperature dependent • Check for algal growth • Sample for fecal coliform and detergents
Dissolved Oxygen	≤5.5 mg/L	• Not enough oxygen to sustain aquatic life • Look for signs of algal growth • Test for phosphorus or nitrogen
Turbidity	Background + 10%	• Dependent on waterbody • Check for sediment sources • Test for phosphorus or nitrogen
Conductivity	<300 ($\mu mhos/cm$)	• Measured in field w/ probe • If the above benchmark sample for fecal coliform
pH	≤5.5 or ≥ 9	• Not useful for determining sanitary wastewater • High pH values may indicate an industrial discharge or residential wash waters
Temperature	>55℉ or 12.8℃	• Indicator of a broad range of industrial discharges • Temperature should be near or below ambient conditions for groundwater or stormwater runoff
Chlorine (Free)	≥ 0.5 ppm	• Supplemental parameter that identifies a few specific industrial discharges • Corrosive to MS4 system at 2 ppm and toxic to wildlife after 0.5 ppm • Check for road salt applications

Adapted From Source: Center for Watershed Protection, 2004

6.1 Indicator Parameters to Identify Illicit Discharges

An ideal indicator parameter should reliably distinguish illicit discharges from clean water and provide clues about its sources. Table 6 summarizes the parameters that meet most of the indicator criteria, compares their ability to detect different flow types, and reviews some of the challenges encountered when measuring them.

Table 6. Indicator Parameters Used to Detect Illicit Discharges

Parameter	Sewage	Wash-water	Tap Water	Industrial/ Commercial Liquid Wastes	Laboratory/ Analytical Challenges
Ammonia	☑	✓	✋	✓	Can change into other nitrogen forms as the flow travels to the outfall
Chlorine	✓	✓	✋	✓	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	✓	✓	✋	✓	
Conductivity	✓	✓	✋	✓	Ineffective in saline waters
Detergents/ Surfactants	☑	☑	✋	✓	Reagent is a hazardous waste!
E. coli/ Total Coliform	✓	✋	✋	✋	24-hour wait for results
Fluoride*	✋	✋	☑	✓	Reagent is a hazardous waste! Exception for communities that do not fluoridate tap water
pH	✋	✓	✋	✓	
Turbidity	✓	✓	✋	✓	

☑ Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water).
✓ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics/helpful in combination with other parameters.
✋ Poor indicator. Cannot reliably detect illicit discharges or tap water.
* Fluoride is a poor indicator when used as a single parameter

Adapted from Source: Center for Watershed Protection, 2004

6.2 Investigating Illicit Discharges

The IDDE plan uses a variety of tools to identify illicit discharge incidents. Isolating the source or improper connection that generates the discharge is a vital step in the investigation process. Once a dry weather flow is determined to be an illicit discharge, inspections upstream in the MS4 conveyance system must occur. There are two widely used techniques for tracing an illicit discharge. These are visual inspections of the storm drain network and drainage area investigations. SLCo Engineering and SLCo Health Department personnel will initiate actions designed to track the source and eliminate the discharge.

The visual inspection process begins when the illicit discharge is observed and recorded. A closed conveyance system visual inspection could require opening multiple manholes. Work upstream from the original location until the flow is low or no longer observed. Keep in mind where junction lines enter the stormwater system. Utilize stormwater maps to determine if this is the case. Typical methods to track the source are sandbagging or damming the trunk, dye testing, smoke testing, and video testing. During this inspection process, key observations are necessary, including:

- Presence of flow
- Oil sheen, scum, or foam
- Colors/clarity
- Stains or deposits
- Odors

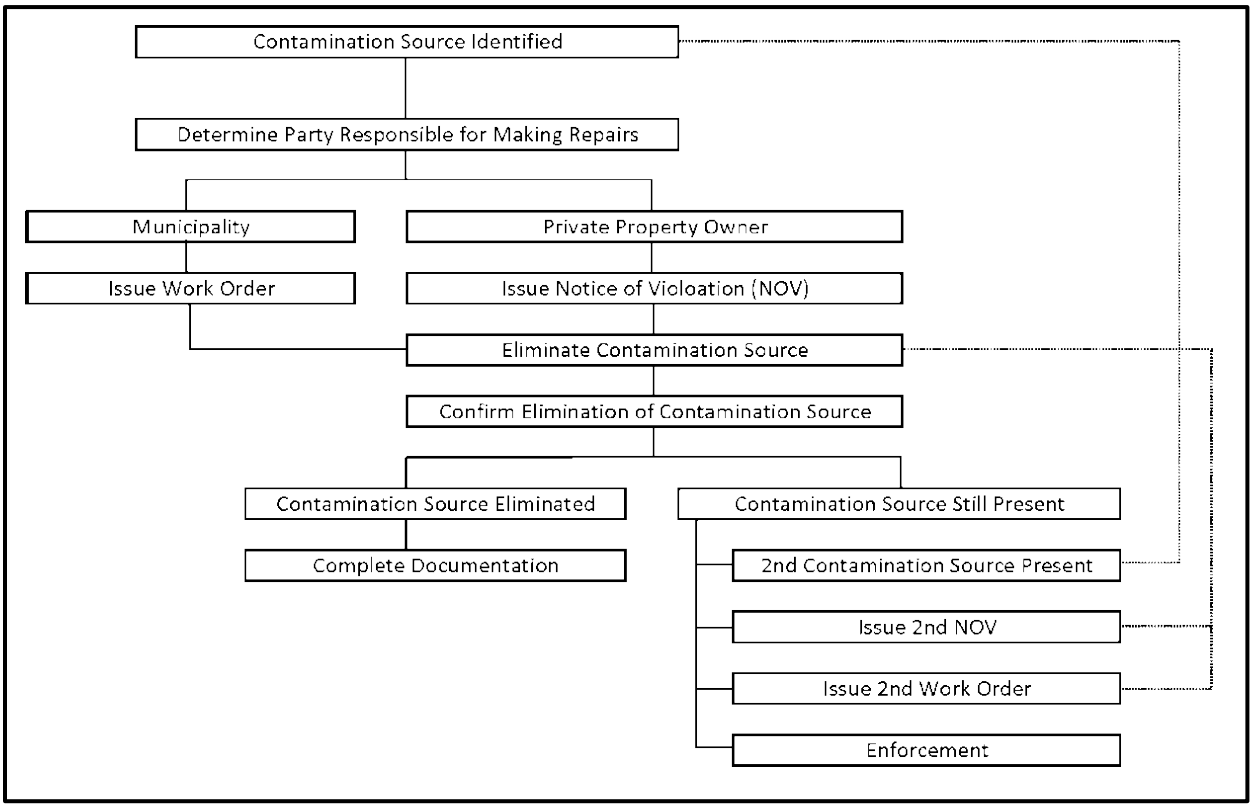
The drainage area investigation analyzes each parcel of land for the potential of illicit discharge-generating sites within the drainage area. These investigations may include the following techniques:

- Land use investigation
- Aerial photography analysis
- SIC/NAICS review
- Property ownership
- Permit review

7 Correcting Illicit Discharges

Once an illicit discharge is identified, staff must then determine who is responsible for the clean-up or removal of the discharge. Methods for removing illicit discharges involve a combination of education and enforcement (Table 5). Voluntary compliance is typically the first step for first-time, minor offenders. Often in residential and commercial areas, property owners are unaware of a problem and are willing to fix it when educated. Serious violations or continued non-compliance warrant a more aggressive, enforcement-oriented approach. Figure 4 provides the flow chart for corrective actions. The standard follow-up time between actions is 24-48 hours.

Figure 4. Flow Chart for Corrective Actions



Source: Center for Watershed Protection, 2004

Table 7. Process for Removing Illicit Discharges

Discharge	Source	Removal Action(s)
Sewage	Break in right-of-way	Repair by operator /perpetrator
	Commercial or industrial direct connection	Enforcement
	Residential direct connection	Enforcement; incentive or aid
	Infrequent discharge (RV dumping)	Enforcement; spill response
	Straight pipes/septic	Enforcement; incentive or aid
Wash Water	Commercial or industrial direct connection	Enforcement; incentive or aid
	Residential direct connection	Enforcement; incentive or aid
	Power wash/car wash (commercial)	Enforcement
	Commercial wash down	Enforcement
	Residential car wash or household maintenance-related activities	Education
Liquid Wastes	Professional oil change/car maintenance	Enforcement; spill response
	Heating oil/solvent dumping	Enforcement; spill response
	Homeowner dumping (oil, paint, solvents)	Warning; education; fines
	Spill (trucking)	Spill response
	Other industrial wastes	Enforcement; spill response

Source: Center for Watershed Protection, 2004

8 REFERENCES

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APPENDICES

IDDE Plan
Appendices

APPENDIX A.0: ACRONYMS AND GLOSSARY

CMP	Corrugated Metal Pipe
CWA	Clean Water Act
DIP	Ductile Iron Pipe
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
HDPE	High Density Polyethylene
IDDE	Illicit Discharge Detection and Elimination
MS4	Municipal Separate Storm Sewer System
NAICS	North American Industry Classification System
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheets
PPM	Parts Per Million
PVC	Polyvinyl Chloride
RCP	Reinforced Concrete Pipe
SIC	Standard Industrial Classification
SLCo	Salt Lake County
TDS	Total Dissolved Solids
UPDES	Utah Pollutant Discharge Elimination System
VCP	Vitrified Clay Pipe

APPENDIX A.1: GLOSSARY

Clean Water Act (CWA) – The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, is designed to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands.

Environmental Protection Agency (EPA) – A government agency concerned with the American environment and its impact on human health.

Floatable Material – Any foreign matter that may float or remain suspended in the water column, and includes but is not limited to, plastic, aluminum cans, wood products, bottles, and paper products.

Geographic Information System (GIS) – Any system that captures, stores, analyzes, manages, and presents data that are linked to a location.

Hazardous Material – Any material including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Illegal Connection – Any drain or conveyance, whether on the surface or subsurface, that allows an illicit discharge to enter the Municipal Separate Storm Sewer System (MS4).

Illicit Discharge – Any discharge to an MS4 that is not composed entirely of stormwater, except those discharges authorized under the National Pollutant Discharge Elimination System (NPDES) permit – other than the NPDES permit for discharges from the MS4 – and discharges from fire fighting activities.

Illicit Discharge Detection and Elimination (IDDE) Program – To find, fix, and prevent illicit discharges.

Indicator Parameter – A water quality measurement that can be used to identify a specific discharge flow type or discriminate between different flow types.

Memorandum of Understanding (MOU) – is a document that describes the broad outlines of an agreement that two or more parties have reached.

Municipal Separate Storm Sewer System (MS4) – As defined at 40 C.F.R. 122.26 (b)(8), a municipal separate storm sewer system means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

1. Owned or operated by a State, city, town, borough, county, parish, district, municipality, township, county, district, association, or other public body (created by or under State law) having jurisdiction over sewage, industrial wastes, including special districts under State law such as a sewer district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

2. Designed or used for collecting or conveying stormwater;

3. Which is not a combined sewer; and

4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 C.F.R. 122.2.

National Pollutant Discharge Elimination System (NPDES) – A permit issued by the EPA (or by a State under authority delegated under 33 USC § 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

Outfall – a point source as defined by *UAC R317-8-1.5(34)* as 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.

Point Source – any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship, or factory smokestack.

Pollutant – Anything that causes or contributes to pollution. Pollutants may include but are not limited to paints, varnishes, solvents, oil and other automotive fluids, non-hazardous liquid and solid wastes, yard wastes, refuse, rubbish, garbage, litter, or other discarded or abandoned objects, floatable materials, pesticides, herbicides, fertilizers, hazardous materials, wastes, sewage, dissolved and particulate metals, animal wastes, residues that result from constructing a structure, and noxious or offensive matter of any kind.

Reagent – A chemical added to a sample to create a reaction that enables the measurement of a target chemical parameter.

Receiving Waters – defined under the Clean Water Act. Receiving waters include surface bodies of water that serve as discharge points for the Storm Water Conveyance System, such as creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays, and the Pacific Ocean.

Stormwater Runoff – The flow of water resulting from and occurring during and following a rainfall event.

Surfactants – The main component of commercial detergents that detaches dirt from the clothing.

Total Dissolved Solids (TDS) – The total amount of mobile charged ions, including minerals, salts, or metals dissolved in a given volume of water.

Treatment – The act of applying a procedure of chemical to a substance to remove undesirable pollutants.

Run-off – is the flow of water occurring on the ground surface when excess rainwater, stormwater, meltwater, or other sources, can no longer sufficiently rapidly infiltrate the soil.

Wastewater – The spent water of a community. From the standpoint of a source, it may be a combination of liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions.

APPENDIX B: ORDINANCE SALT LAKE COUNTY TITLE 17

Public Works Flood Control Permits Title 17 - Chapter .08

A. The following facilities, wherever located in the county, including open channel sections and sections in conduit, are declared to be part of the storm drainage and flood control system and are subject to the provisions of this chapter relating to such facilities:
    1. The Jordan River
    2. City Creek
    3. Red Butte Creek
    4. Emigration Creek
    5. Parley's Canyon Creek
    6. Mountain Dell Canyon Creek
    7. Lamb's Canyon Creek
    8. Mill Creek
    9. Neff's Creek
    10. Big Cottonwood Creek
    11. Little Cottonwood Creek
    12. Dry Creek from Bell's Canyon Reservoir to Jordan River
    13. Big Willow Creek
    14. Little Willow Creek
    15. Corner Creek
    16. Beef Hollow Creek Downstream from Camp Williams Boundary
    17. Wood Hollow Creek Downstream from Camp Williams Boundary
    18. Rose Creek
    19. Butterfield Creek
    20. Copper Creek
    21. Midas Creek
    22. Bingham Creek
    23. Barney's Creek
    24. Harker's Canyon Creek
    25. Coon Canyon Creek
    26. Utah Lake Distributing Company Canal
    27. Utah and Salt Lake Canal
    28. South Jordan Canal
    29. North Jordan Canal
    30. Kennecott Canal
    31. Riter Canal
    32. Kersey Creek
    33. C-7 Ditch
    34. Lee Creek
    35. 8000 West Drain - Utah and Salt Lake Canal to C-7 Ditch
    36. Kearns-Chesterfield Drain - Utah and Salt Lake Canal to Jordan River including Decker Lake
    37. Lee Drain - Lee Drain Pump Station to Lee Creek
    38. Goggin Drain Surplus Canal to Great Salt Lake
    39. Surplus Canal
    40. 2700 West Drain - North Jordan Canal to I-215 Drain
    41. I-215 Drain - 4700 South to 4100 South and 2700 West Drain to Decker Lake
    42. 4100 South Drain - 3200 West to Jordan River
    43. 4700 South Drains - South Jordan Canal to I-215 Drain and North Jordan Canal to Jordan River
    44. 3200 West Drain - 4700 South to 4100 South

45. 5400 South Drain - Utah and Salt Lake Canal to Jordan River
46. City Drain, West Branch from CWA 2 Drain to Sewage Canal
47. Sewage Canal from City Drain to Great Salt Lake
48. CWA 2 Drain from CWA 1 Drain to West Branch City Drain
49. CWA 3 Drain from Brighton Canal Extension to CWA 2 Drain
50. CWA 1 Drain from Roper Yard to CWA 2 Drain
51. 4th Avenue Drain - Virginia Street to City Creek
52. 8th South Drain - East High School Detention Basin to Jordan River
53. 7200 South Drain - East Jordan Canal to Jordan River
54. 9000 South Drain - Sandy Irrigation Canal to Jordan River
55. Salt Lake City Canal to Red Butte Creek
56. East Jordan Canal
57. East Jordan Canal Extension
58. 2700 South Storm Drain - Nibley Park Outfall to Mill Creek

B. If not owned by the county, the rights of the county in and to canals and storm drains specified above are limited to those included in specific agreements for their use with the owners of such facilities.

C. The provisions of this chapter shall also apply to the following classes of facilities:
    1. All collection storm drains and subsurface collection systems installed in dedicated easements and other easements in which the county has a legal interest and is located in the unincorporated county area.
    2. All collection storm drains and subsurface collection systems installed in dedicated easements and located in the incorporated areas of the county through contracts and agreements specifically outlining the duties and responsibilities of the city and county on each facility. (Ord. 1478 §§ 2, 2001: Ord. 1433 §§ 2, 1998; Ord. 918 §§ 1, 1985; Ord. 817 §§ 2 (part), 1982: prior code §§ 7-2-5)

APPENDIX C: PARKS E. COLI SITES

Park	Address	Zip	Description
Big Cottonwood Park	4500 S 1500 E	84117	Park
Bingham Creek Regional Park	10200 South 4800 West	84095	Park
Crestwood Park	1673 E Siesta Dr	84093	Park
Decker Lake Park	2300 Parkway Blvd	84119	Park & Detention
Dimple Dell Park	10300 S 1300 E	84094	Park
Evergreen Park	2230 E Evergreen Ave	84109	Park
Sugarhouse Park	1300 E 2100 S	84105	Park & Detention
Wheadon Farm	13965 S Bangerter Parkway	84020	Park
Wheeler Farm	6351 S 900 E	84121	Park & Detention
Millrace Park	1150 W 5400 S	84123	Park
Valley Regional Park	5100 S 2700 W	84123	Park
Northwest Grounds (Constitution)	130 W 300 N	84116	Park
Scott Avenue Park	872 E Scott Ave	84106	Park & Detention
Pioneer Crossing Regional Park	1276 Cultural Center Dr	84119	Park

Trailhead	Address	Zip	Description
Yellow Fork Canyon Trailhead	8094 W Rose Canyon Rd	84096	Trailhead
Jordan River Trail 4800 S	800 W 4800 S	84104	Trailhead
Jordan River Trail Arrow	13807 S 1300 W	84151	Trailhead
Jordan River Trail Holm	1050 W 3900 S	84065	Trailhead
Jordan River Trail Little Confluence	790 West 4800 South	84124	Trailhead
Jordan River Trail Loop	1003 W 2320 S	84123	Trailhead

Golf Courses	Address	Zip	Description
Meadow Brook Golf Course	4197 S1300 W	84123	Golf Course
Mick Riley Golf Course	421 E Vine St	84107	Golf Course
Mountain View Golf Course	2400 W 8660 S	84088	Golf Course
Old Mill Golf Course	6080 S Wasatch Blvd	84121	Golf Course
Riverbend Golf Course	12800 S 1040 W	84065	Golf Course
South Mountain Golf Course	1247 E Rambling Rd	84020	Golf Course

APPENDIX D: IDDE STANDARD OPERATING PROCEDURES (SOPS)

IDDE Reporting and Response

Purpose:

To outline the procedure for collecting information when a phone call or online report is received regarding suspected illicit discharges and initiating an investigation.

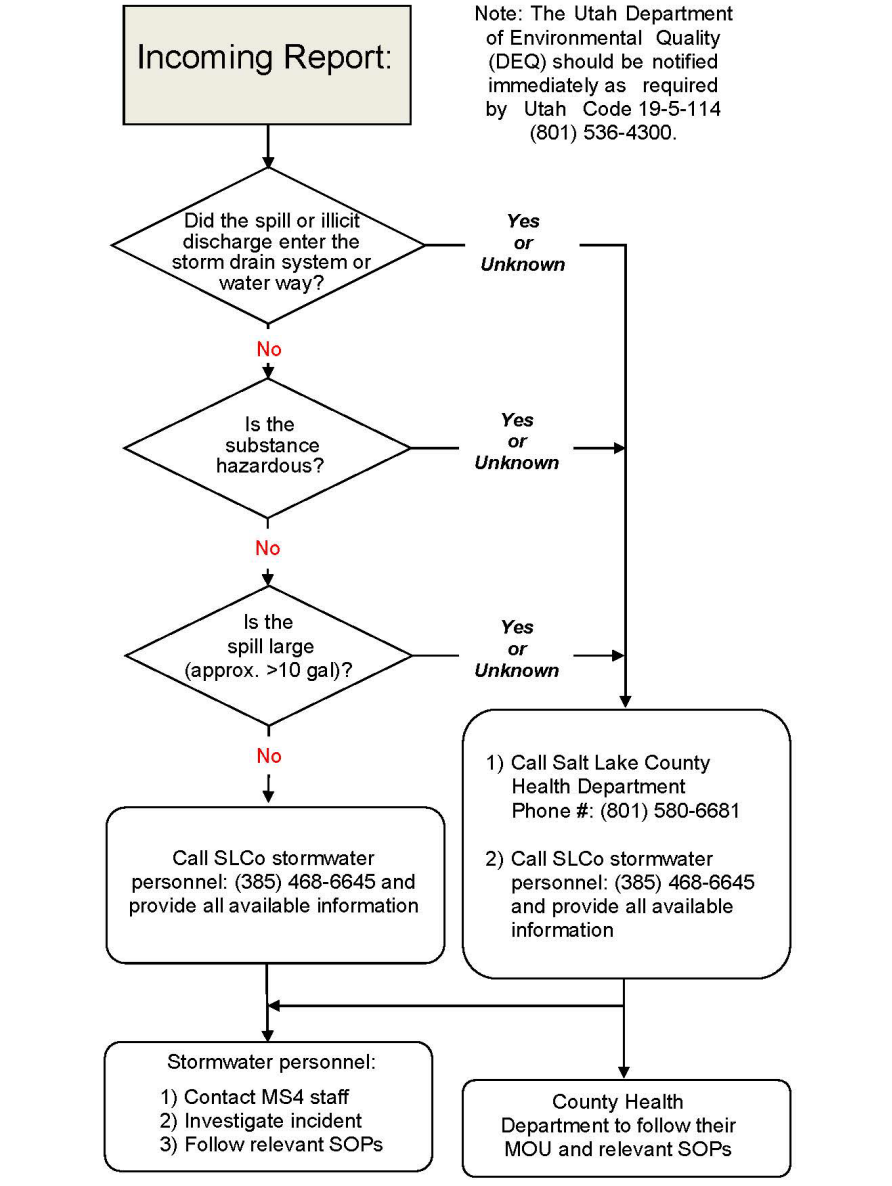
Information Gathering and Notification Procedure:

1. Collect the information from the caller. Online reports are received by email.
2. Information to collect from phone calls for the Incident Tracking Form:
    a. Date and location of the spill
    b. Description of spill
    c. Estimated quantity of spill
    d. If the spill is contaminating a nearby waterway or storm drain
    e. Contact information
    f. Have the caller submit photos (if available)
3. If the spill poses a threat to human health or the environment, have the caller call 911.
4. Notify stormwater personnel of the incident and forward all available information.
5. Stormwater personnel will notify appropriate agencies based on the IDDE Incident Response Flow Chart.
6. Stormwater personnel will investigate based on the location of the spill or assist co-permittee MS4s, SLCo Health Department, and DEQ with the investigation, as needed.

Response Procedure:

1. When the reported spill contaminates a nearby waterway or storm drain within the Salt Lake County or MSD service area, a member of the stormwater team will assist the SLCo Health Department with the investigation of the reported incident.
2. Document the spill and take photos.
3. Inspection information to collect:
    a. Date of the spill and date notified
    b. Date of investigation
    c. Location of the spill
    d. Description of spill and photos
    e. Record physical indicators: odor, color, floatables
    f. Record field parameters when there are no physical indicators present
    g. Date of removal, repair, or enforcement action taken
4. If an illicit discharge is confirmed and the source is unknown, follow the procedure for **IDDE Tracing Illicit Discharge**.
5. If an illicit discharge is confirmed and the source is known, follow the procedure in IDDE Removing Small Non-Hazardous Illicit Discharges or IDDE Large, Hazardous, or Storm Drain/Water Impacting Illicit Discharges.
6. Upload photos and enter the incident into the Vueworks database. Follow up with the responsible party or the SLCo Health Department to confirm the completion of clean-up and incident closeout. Record the date and method of removal.

REPORTING AND RESPONSE FLOW CHART
Salt Lake County



Standard Operating Procedures
Salt Lake County Stormwater
Rev 05/17/22

FIELD DATA SHEET

Sub-watershed:	Outfall ID:
Today's Date:	Time:
Investigator:	
Temperature (°F):	Rainfall (in.):
Latitude:	Longitude:

Land Use (Check all that apply): ☐ Industrial ☐ Urban Residential ☐ Open Space	☐ Suburban Residential ☐ Commercial ☐ Institutional ☐ Other:		Open Space E.coli BMPS (Check all that apply): ☐ Sign ☐ Pet Waste Bags ☐ Other:	Notes:

Section 2: Outfall Description

LOCATION	MATERIAL		SHAPE		DIMENSION (IN.)	SUBMERGED
☐ Closed Pipe	☐ RCP ☐ CMP		☐ Circular ☐ Single		Diameter/Dimension:	In Water: ☐ No ☐ Partially ☐ Fully
	☐ PVC ☐ HDPE		☐ Elliptical ☐ Double			
	☐ Steel		☐ Box ☐ Triple			With Sediment: ☐ No ☐ Partially ☐ Fully
	☐ Other:		☐ Other: ☐ Other:			
Flow Present?	☐ Yes	☐ No	If No, Skip to Section 5			
Flow Description (If Present)	☐ Trickle	☐ Moderate	☐ Substantial			

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS					
PARAMETER		RESULT		UNIT	EQUIPMENT
☐ Flow #1	Volume			Liter	Bottle
	Time to Fill			Sec	Watch/Phone
☐ Flow #2	Flow Depth			In	Tape Measure
	Flow Width	'	"	Ft, In	Tape Measure
	Measured Length	'	"	Ft, In	Tape Measure
	Time of Travel			S	Watch/Phone
pH				dimensionless	pH Probe
Temperature				°F	DO Meter
Dissolved Oxygen				% &mg/L	DO Meter
Conductivity				µS	DO Meter
Turbidity				NTU	Turbidimeter
Ammonia/Chlorine				mg/L / ppm	Test Strips
E. coli				MPN	Bottle

IDDE Tracing Illicit Discharge

Purpose:

To outline the procedure for tracing a confirmed illicit discharge from an unknown source.

Notifications:

Confirm that the appropriate MS4, the Salt Lake County Health Department (801-580-6681), and the Utah Department of Environmental Quality (801-536-4123) have been notified as required of the spill (see **IDDE Reporting and Response**).

Containment:

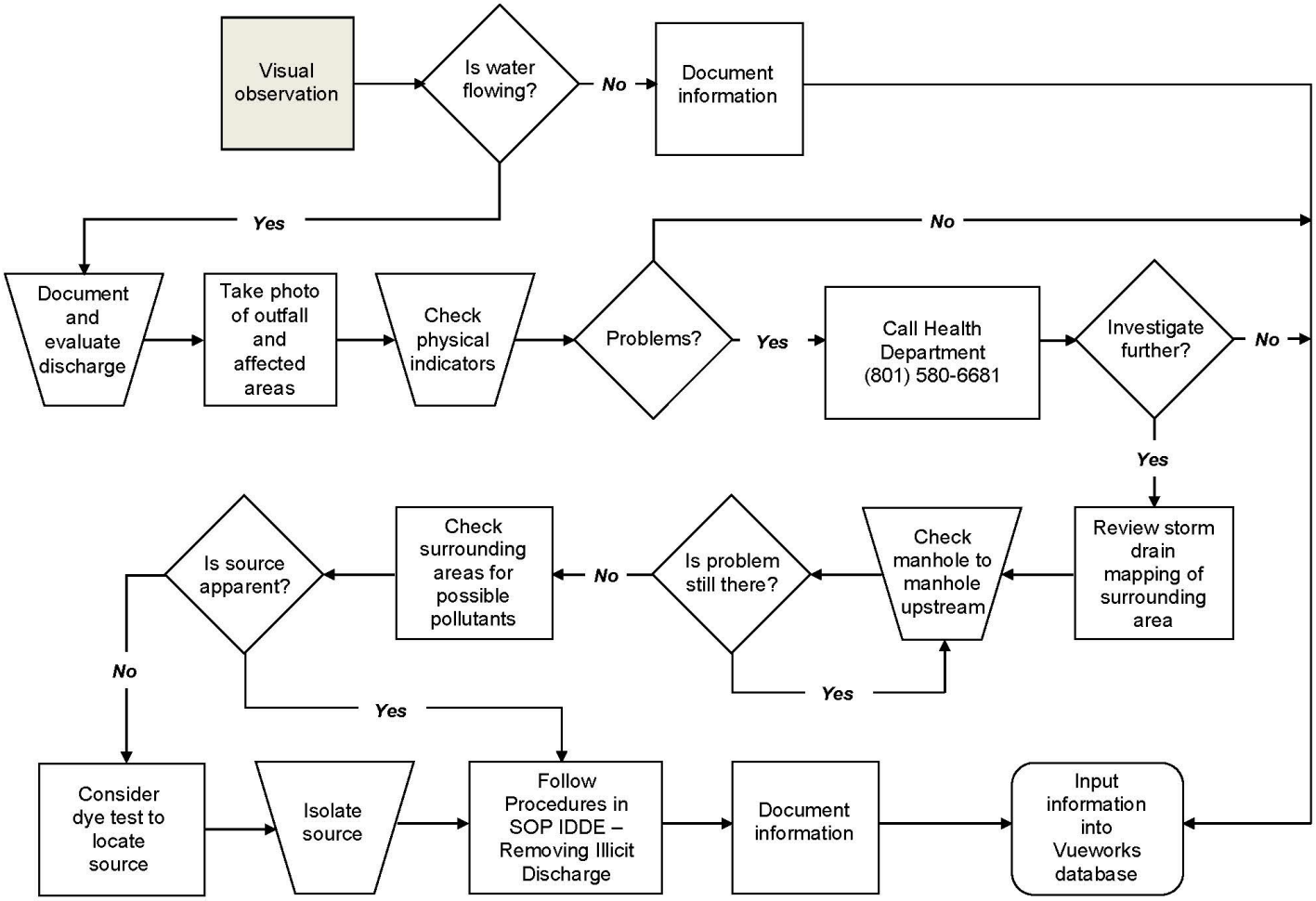
Immediately make efforts to stop or contain the discharge if possible.

1. Use appropriate personal protection equipment.
2. The general spill containment procedure is the following (when safe to do so):
    f. Stop the source of the spill.
    g. Cover storm drain inlets, manholes, and outfalls as needed.
    h. Contain any spilled material using spill kits or other available materials.
    i. Surround the perimeter of the spill with absorbent pads/rolls, berms, etc.
    j. Take any further action directed by the SLCo Health Department or DEQ.

Tracing Unknown Source:

1. Visually inspect inlets, pipes, and outfalls upstream of the discharge area for possible pollutants.
2. Use GIS software to trace the path of manholes back to the potential source.
    a. Open the manhole and visually check for physical parameters:
        i. flow
        ii. colors
        iii. odors
        iv. floatable materials
        v. deposits or stains
    b. Investigate manholes closest to the outfall first and move up the sewer network until the source is identified or isolated between two manholes.
3. If the source is apparent, assist the SLCo Health Department in collecting water samples (when appropriate), enforcement actions, and cleanup procedures.
4. For small non-hazardous spills that do **not** affect nearby waterways or storm drains, follow the procedure in **IDDE Removing Small Non-hazardous Illicit Discharges**.
5. If the source is not apparent, collect field parameters as an indicator of the discharge source. Refer to the parameter table to check potential sources based on concentrations.
6. If the above efforts fail to identify the source, revisit the site the next business day to determine whether repeat visits are required or if the discharge was a one-time event.

ILLICIT DISCHARGE SCREENING FLOW CHART



Field Parameter Table

Parameter	Benchmark Concentration	Notes
Ammonia (as Nitrogen)	≥1 ppm	• pH and temperature dependent • Check for algal growth • Sample for fecal coliform and detergents
Dissolved Oxygen	≤5.5 mg/L	• Not enough oxygen to sustain aquatic life • Look for signs of algal growth • Test for phosphorus or nitrogen
Turbidity	Background + 10%	• Dependent on waterbody • Check for sediment sources • Test for phosphorus or nitrogen
Conductivity	<300 ($\mu mhos/cm$)	• Measured in field w/ probe • If the above benchmark sample for fecal coliform
pH	≤5.5 or ≥ 9	• Not useful for determining sanitary wastewater • High pH values may indicate an industrial discharge or residential wash waters
Temperature	>55℉ or 12.8℃	• Indicator of a broad range of industrial discharges • Temperature should be near or below ambient conditions for groundwater or stormwater runoff
Chlorine (Free)	≥ 0.5 ppm	• Supplemental parameter that identifies a few specific industrial discharges • Corrosive to MS4 system at 2 ppm and toxic to wildlife after 0.5 ppm • Check for road salt applications

IDDE Removing Small Non-Hazardous Illicit Discharges

Purpose:

To outline the procedure for containing and cleaning up small non-hazardous spills that do not affect storm drains or waterways and the proper disposal of the waste.

Notifications:

1. Confirm that the appropriate MS4, the Salt Lake County Health Department (801-580-6681), the property owner, and the Utah Department of Environmental Quality (801-536-4123) have been notified as required (see the flowchart in **IDDE Reporting and Response**).
2. Notify the property owner and inform them of their responsibility to clean up the spill and offer technical assistance.
3. When there is no property owner or responsible party available, stormwater personnel will clean up small non-hazardous spills and return within 48 hours to reinspect the site and notify/educate the property owner.

General Containment:

Immediately make efforts to stop or contain the discharge if possible. Never wash spills into the storm drain inlet.

1. Use appropriate personal protective equipment.
2. The general spill containment procedure is the following:
    a. When possible, stop the source of the spill.
    b. Cover storm drainpipes, manholes, and inlets as needed.
    c. Use dry clean-up methods such as sorbent materials, broom and shovel, and vacuum.
    d. Place a barrier around the spill. Contain any spilled material and surround the perimeter of the spill with absorbent pads/rolls, berms, etc.
    e. Cover the spill completely with appropriate material.
3. Clean up and dispose of waste:
    a. After the spill is absorbed, dry sweep or vacuum the material into waste bags.
    b. Depending on the contents of the spill, dispose of waste bags according to local regulations.
    c. If the spill soaks into the soil, dig up the affected area and dispose of it according to state and federal regulations.

Disposal:

Dispose of material in compliance with local, state, and federal regulations. For questions regarding disposal methods or procedures for clean-up or spill materials, contact the Salt Lake County Health Department (801-468-3862).

Documentation:

Document notifications, containment, clean-up, and disposal in Vueworks.

IDDE Large, Hazardous, or Storm Drain/Water Impacting Illicit Discharges

Purpose:

To outline the procedure for containing and cleaning up spills that require notification of the Salt Lake County Health Department and the Utah Department of Environmental Quality based on the size, location, and contents.

Notifications:

Confirm that the appropriate MS4, the Salt Lake County Health Department (801-580-6681), the property owner, and the Utah Department of Environmental Quality (801-536-4123) have been notified as required of the spill (see Reporting and Response Flow Chart).

Assist DWQ and Salt Lake County Health Department Emergency Response Personnel with:

1. Determining the property owner or the financially responsible party.
2. Contact the owner regarding laws, ordinances, codes, and any other concerns.
3. Suspending access to storm drain when possible.
4. Directing the responsible party to initiate repairs/corrections/clean-up.
5. Coordinating with enforcement officials for escalating penalties.
6. Follow-up inspections and confirmation of clean-up.

Documentation:

Notifications, containment, and clean-up information are documented in Vueworks.

APPENDIX E: HEALTH AND SAFETY GUIDELINES

Dry weather water sampling may occur when the sampling environment and discharges create hazardous conditions. **Always** use safety precautions when conducting dry weather monitoring.

• Keep a first aid kit and a fire extinguisher in the vehicle.

• Watch for traffic along access roads.

• Park the vehicle off-road and turn hazard lights on.

• Do NOT remain in open areas or stand under trees if there is lightning.

• The ground may be wet, slippery, steep, or unstable. Do not attempt to climb down unsafe slopes.

• Always wear clean latex rubber gloves when sampling.

• Protect eyes and skin against contact with acids and preservatives.

• Wear appropriate attire (i.e., hat, safety boots, gloves, and long pants).

• Be aware of your environment. Watch for snakes, ticks, bees, poison oak, etc.

• Use common sense when deciding whether to sample during adverse weather conditions. This plan is intended to assess dry weather conditions. Do not sample during dangerous conditions such as high winds, lightning storms, or flooding conditions that might be unsafe.

• Do not enter channels during periods of high flow. The general rule of thumb is: if the product of the water depth in feet and the velocity in feet per second is greater than 10, or the level is above your waist, don't go in.

• Do not enter confined spaces.

• Follow all analytical procedures as prescribed in the equipment manuals. Give careful attention to warnings and precautionary statements.

• Be familiar with Material Safety Data Sheets (MSDS) for all chemicals used in the field and when calibrating instruments. Know the health hazards and emergency medical treatments and follow proper disposal instructions.

APPENDIX F: E. COLI PARKS INSPECTION SAMPLE

E. coli Parks Inspection

Submitted By: GHamilton@slco.org_slco

Submitted Time: December 1, 2023 10:17 AM

Park Name
Sugarhouse Park

Inspection Date
December 1, 2023

Inspection Location

Is there visible pet waste upgradient of inspection point?
No

Is there visible waterfowl activity or waste upgradient of inspection point?
Yes

Are pet waste containers appropriately contained?
Yes

Are pet waste bags available?
Yes

Is there sediment/debris built up in gutters or catch basins?
No

Is there evidence of sanitary waste (i.e., odor, staining, debris)?
No

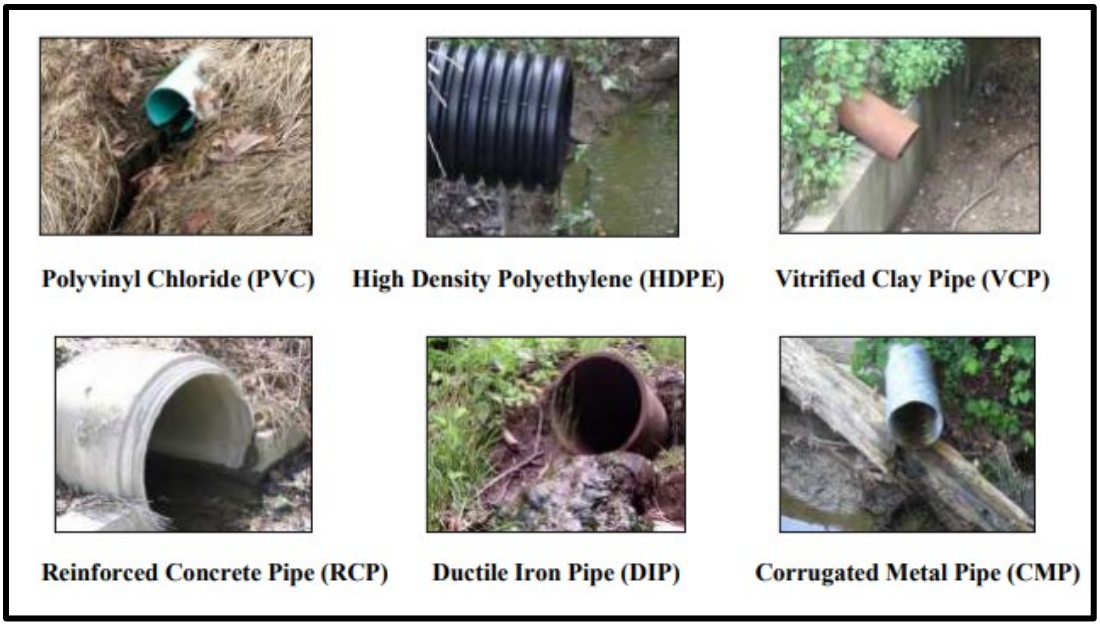
Is there evidence of dry weather discharge?
No

Corrective Action:
Record, Watch, Report, Clean up, Log for future installation, Fill out DWS Form

Corrective Action Notes
Form test run

APPENDIX G: TYPES OF OUTFALLS & CHARACTERIZING SUBMERSION AND FLOW

Photo Source: Center for Watershed Protection, 2004



APPENDIX H: ESTIMATING FLOW RATES

There are two techniques used for estimating flow rates of the Field Data Sheet.

Method 1:

The first technique simply records the time it takes to fill a container of a known volume, such as a one-liter sample bottle. The flow volume is determined by the volume of flow captured in the container per unit of time.

$$\text{Flow rate Q (gpm)} = \frac{Volume\ of\ Container\ (gal)}{Time\ to\ fill\ (sec)} \times \frac{60\ sec}{1\ min}$$

Method 2:

The Float method is used when discharge is exposed or easily accessible, like open drains or channel flows. Mark off a fixed flow length of at least 5 feet, use something light and floatable (crumbled leaves, etc.) as a marker, drop the marker in the water, and measure the time it takes for the marker to travel the flow length.

The **velocity** (ft/min or ft/sec) is estimated by measuring the time it takes crumbled leaves or other light material to travel between two points along the flow path.

The **area** (ft^2) is calculated by averaging 3 readings of the flow depth and multiplying that average by the width of the flow.

The **flow rate** (cfm or cfs) is calculated by estimating the velocity of the flow and the cross-sectional area of the discharge using the standard flow rate equation.

Flow rate (cfm or cfs) = Velocity (ft/min or ft/sec) * Area (ft^2)

APPENDIX I: WATER QUALITY SCREENING MEASURES

pH

The pH value of water indicates the relative acidity. The pH value can range from 0 to 14, a range of 6 to 8 is the most desirable range for most bodies of water. Waters with very high (basic) or very low (acidic) pH are corrosive to metal surfaces and cause biological problems for aquatic organisms and fish. pH is affected by industrial processes like acidic wastewater discharges, solutions used in metal plating operations, acidic chemicals used in printing and graphic art businesses, cement used in concrete products and concrete pavement, and chemical cleaners used in homes and businesses.

Temperature

Temperature is a simple measurement and one of the more important parameters to be considered. It dramatically affects the rates of chemical and biochemical reactions within the water. Many biological, physical, and chemical principles depend on the temperature. Shallow bodies of water are much more susceptible to temperature changes because their capacity to store heat over time is also small. An unusual temperature in a stormwater system could indicate thermal pollution introduced by illegal discharges into the system.

Dissolved Oxygen (DO)

Dissolved oxygen is the amount of oxygen present within the water. The stream system produces and consumes oxygen. Oxygen is gained from the atmosphere and plant photosynthesis. Respiration by aquatic animals, decomposition, and various chemical reactions consume oxygen. DO levels fluctuate seasonally with water temperature and altitude. Low dissolved oxygen levels are not adequate to support aquatic life and can lead to fish kills.

Conductivity

Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that have a positive charge). Natural sources, failing sewage systems, and industrial discharges affect conductivity.

Turbidity

Turbidity is a measure of water clarity. Suspended materials, including soil particles (clay, silt, and sand), algae, plankton, microbes, and other substances, impact clarity in the water. Turbidity approximates the amount of total suspended solids (TSS) in water. Soil Erosion, excessive algae population, waste discharge, land development, and urban runoff affect turbidity. Higher turbidity increases water temperatures. Higher turbidity reduces the amount of light penetrating the water, which reduces photosynthesis and the production of DO. Suspended materials can clog fish gills, reduce resistance to disease in fish, lower growth rates, and affect egg and larval development. As the

particles settle, they can blanket the stream bottom, especially in slower waters, and smother fish eggs and benthic macroinvertebrates.

Ammonia

Nitrates are a form of nitrogen and have many forms in terrestrial and aquatic ecosystems. These forms of nitrogen include ammonia (NH3), nitrates (NO3), and nitrites (NO2). Nitrates are essential nutrients for plants, but in excessive amounts, they cause significant water quality problems. Leaves and woody debris, decaying organisms, fertilizers, failing septic systems, pet waste, and industrial discharges affect ammonia levels. Phosphorus and nitrates in excess accelerate eutrophication, causing dramatic increases in aquatic plant growth and changes in the types of plants and animals that live in the stream. This affects dissolved oxygen, temperature, and other indicators. Excess nitrates cause hypoxia (low levels of dissolved oxygen) and can become toxic to warm-blooded animals at higher concentrations (10 mg/L or higher). The natural level of ammonia or nitrate in the surface water is typically low (less than 1 mg/L).

Chlorine

Chlorides are common water pollutants and are naturally present in water. Chloride ions are stable and can move through the environment, in solution, without being lost or broken down through natural processes. As a result, almost all chloride ions that enter the environment reach surface water. Chloride increases the electrical conductivity of water and thus increases its corrosivity. Road salt from de-icing, industrial discharges, and treated water infiltration are common sources of chloride pollution. Elevated concentrations of chloride are toxic to aquatic life and increase the potential corrosivity of the water. In metal pipes, chlorides react with metal ions to form soluble salts that increase the levels of metals in water and corrode infrastructure.

Appendix J: Physical Indicators

Odor

A severity score of 1 means that the odor is faint or that the origin is unknown. A score of 2 indicates a moderate odor within the pipe. A score of 3 is assigned if the odor is so strong that it is present a considerable distance away from the outfall.

Color

The discharge color can be clear, slightly tinted, or intense. The Field Data Sheet only requires a visual assessment of the discharge color and its intensity. The easiest way to measure color is to collect the discharge in a clear sample bottle and hold it up to the light. Do not collect water if the color appears to be biological waste or any other hazardous or unknown substance.

Photo Source: Center for Watershed Protection, 2004

Floatable Material

Sewage, oil sheen, and suds are examples of floatable indicators; trash and debris are generally not considered floatable material in the context of the Field Data Sheet. If the floatable material is raw sewage, a severity score of 3 is assigned. Surface oil sheens are ranked based on their thickness and coverage. Natural processes can create surface sheens that are not always related to oil discharges. A thick or swirling sheen associated with a petroleum-like odor is diagnostic of an oil discharge.

Suds are rated based on their foaminess and staying power. A severity score of 3 is for thick foam that travels many feet before breaking up. Suds that break up quickly may reflect water turbulence and not an illicit origin. Some streams have natural foams from the decay of organic matter. Suds accompanied by a strong organic or sewage-like odor could indicate a sanitary sewer leak or connection. If the suds have a fragrant odor, they may indicate laundry water or similar wash water.

APPENDIX K: GRAB SAMPLE PROCEDURE FOR LAB ANALYSIS

Sample bottles are obtained from the laboratory and are prepared for specific analysis by the laboratory. Sample bottles and chain-of-custody forms are filled out before sample collection. Sample sites are located by GPS.

The following guidelines will be employed when collecting grab samples:

- ☐ Grab samples collected directly into laboratory-supplied containers
- ☐ Sample containers are properly labeled.
- ☐ Grab samples are collected from the horizontal center channel
- ☐ Avoid stirring the bottom sediment during sample collection
- ☐ Sample containers are held with the container opening facing upstream
- ☐ Avoid touching the inside of sample containers to avoid contamination
- ☐ After collection place the sample in a cooler with ice
- ☐ Record sample collection times on chain-of-custody forms and the Feld Data Sheet
- ☐ Use caution filling sample containers to avoid spills, splatter, or washout of preservatives
- ☐ If direct sample collection is not possible use Teflon Bailers to collect a sample

Equipment Decontamination

Sample collection containers are decontaminated using a phosphorus-free detergent, such as Alcanox™, and deionized water. Sample collection containers are decontaminated by triple-rinsing with deionized water between each sample site. Bottles obtained from the analytical laboratory do not require decontamination and are disposed of by the laboratory. Field test kits and probes are cleaned and calibrated according to manufacturer instructions.

SALT LAKE COUNTY

Jenny Wilson
Mayor

Catherine Kanter
Deputy Mayor of Regional Operations

Scott R. Baird, P.E.
Director, Public Works Department

Kade D. Moncur, P.E., CFM
Director, Flood Control Engineering Division

FLOOD CONTROL ENGINEERING DIVISION

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September 16, 2020

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Salt Lake County Health Department

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Greater Salt Lake Municipal Services District (MSD)

2001 S State Street # N3-600

Salt Lake City, Utah 84190

Re: MEMORANDUM OF UNDERSTANDING

Cooperation and Enforcement of Salt Lake County's UPDES Stormwater discharge permit

This Memorandum of Understanding (MOU) is entered into by and between the Salt Lake County Health Department (Health Department), Salt Lake County Public Works Department – Flood Control/ Engineering Division, Salt Lake County Public Works- Engineering and the Greater Salt Lake Municipal Services District (MSD) and together are sometimes referred to as the "PARTIES," in the enforcement of the Salt Lake County UPDES Stormwater Discharge Permit UTS0000001.

Whereas, The Salt Lake County Health Department is organized as a County health department and exists pursuant to the Utah Code Ann. 26A-1-103 and chapter 9.04 of the Salt Lake County Code of Ordinances; and

Whereas, the Health Department is responsible for enforcing state laws, administrative rules, local ordinances, standards and regulations relating to public health, sanitation, safety and environmental quality as provided for in the Utah Local Health Department Act, Utah Code Ann. 26A-1-114; and

Whereas, pursuant to 26A-1-114(1), the Health Department may enforce state laws, local ordinances, department rules and local health department standards and regulations in all incorporated and unincorporated areas of Salt Lake County; and

Whereas, the Health Department has adopted health regulations including Regulation #1 and #13 prohibiting the discharge or release of pollutants or contaminants into storm sewers, drains, gutters or waters of the State; and

Whereas, Health Regulation #13 is also incorporated in Section 9.32.010 of the Salt Lake County Code of Ordinances; and

Whereas, Utah Code Ann, 17-8-5 provides the county legislative body may promulgate regulations to protect channels, storm sewers, and drains and may provide for the enforcement of those regulations; and

Whereas, Salt Lake County has enacted section 17.08.020 of the Salt Lake County Code of Ordinances, which provides for the safe disposal of natural storm waters and flood waters and which prohibits the interference, damage or use of any flood control, storm drainage or water quality facility without having first received written permission from the division; and

Whereas, Salt lake County has adopted 17.08.100 of the Salt Lake County Code of Ordinances which makes it unlawful for any person to place or cause to be placed in a drain, channel, reservoir, detention basin or any other flood control facility any

matter of any kind that may degrade the quality of the water without having first receiving written permission from the Engineering Division.

This section also makes it unlawful for any person to place or cause to be placed in a drain, channel, reservoir, detention basin or any other flood control facility any matter of any kind that may degrade the quality of the water without having received written permission from the Engineering Division.

Whereas, Section 1.12.010 of the Salt Lake County Code of Ordinances provides that the violation of any provisions of an ordinance constitutes a class B Misdemeanor; and

Whereas, 26A-1-120(1) of the Utah Local Health Department Act provides that the County Attorney shall prosecute criminal violations of the Public Health Laws and Rules and 26A-1-123 Unlawful Acts-- Criminal and civil liability of the Departments of Health and Environmental Quality; and

Whereas, the Parties wish to enter into this MOU to formalize the procedure for the enforcement and inspections of applicable statutes, ordinances and health regulations to protect water quality.

Now, therefore, in consideration of the following mutual promises, terms and conditions, it is agreed by the parties as follows:

1. **Parties Responsibilities of the health Department**
   - 1.1 The Health Department's Environmental Health Division will assist Salt Lake County Flood Control Engineering and Public Works Engineering in the investigation of incidents involving spills, releases or discharge of pollutants, contaminants, or waste into waterways and drainage systems. The Health Department will work with the responsible party and the Flood Control Engineering/ Public Works Engineering to ensure the spill or discharge is remediated as required by rule or regulation;
   - 1.2 The Health Department agrees to respond to any reports from the Flood Control Engineering/Public Works Engineering regarding spills, releases or the discharge of pollutants, contaminants or waste in gutters, storm drains and flood control facilities;
   - 1.3 The Health Department will also report to the Flood Control Engineering/Public Works Engineering any complaints received or violations discovered by the Health Department personnel, during routine inspections or complaints at restaurants and other establishments applicable which present a potential for a stormwater violation, discharge

or spill in accordance with the UPDES UTS0000001 Permit issued to Salt Lake County as a large MS4;

1.4 The Health Department will provide annual reports to the Flood Control Engineering/Public Works Engineering Divisions that includes the status of the complaints and actions taken in the response to complaints in the Unincorporated County and municipalities served by the MSD, to resolve and finalize by documentation cases for the UPDES Permit annual report, and the Illegal and Illicit Discharge Elimination (IDDE) control measures requirements:

1.5 The Health Department agrees through its regulations adopted by the Salt Lake County Board of Health, pursuant to Section 9.04.060 of the County Code of Ordinances, which contains procedures for the enforcement of violations through civil, administrative or criminal proceedings pending the severity of the violation, to help determine the severity of the enforcement of a violation.

1.6 The Health Department will initiate and assist Salt County Flood Control Engineering/Public Works Engineering in appropriate enforcement actions to compel compliance and pursue sanctions for violations that coincide with the County's UPDES Discharge Permit, UTS000001;

1.7 A courtesy copy of warning letters and Notice of Violations letters issued for stormwater discharges in unincorporated areas and municipalities served by the MSD, will be provided to the Watershed Section Manager in the Flood Control Engineering Office at 2001 S State Street #N3-120 Salt Lake City, Utah 84190;

1.8 The Health Department will participate in the County's Flood Control and Water Quality Management Planning Program designed to enhance and protect water quality by making an annual contribution of $5,000.00 to the County Stormwater Coalition Education Campaigns;

1.9 The Health Department will provide household hazardous waste facilities to all citizens of incorporated municipalities and Unincorporated Salt Lake County. The household hazardous waste program allows for the public to dispose of leftover products that contain corrosive, toxic, ignitable, or reactive substances (such as antifreeze, batteries, paint, cleaners, oil, and pesticides). This includes services such as mailers, ads, collection events and ABOP disposal locations for antifreeze, batteries, oils and paint. Generators of (CESQG) are not allowed to dispose of hazardous waste at these facilities and must dispose of them at an approved landfill; Very Small Quantity Generator businesses (VSQGs) are allowed to dispose of certain hazardous wastes at household hazardous waste facilities for a fee;

1.10 The Health Department will help collaborate an Industrial Education Program for all municipalities of Salt Lake County, with a Stormwater Pollution Prevention Campaign and will assist Flood Control

Engineering/Public Works Engineering with any enforcement related to violations associated to the UPDES Permit UTS000001;

1.11 The Health Department will notify Salt Lake County Flood Control Engineering/Public Works Engineering of spills or responses in other cities that are adjacent to the boundary with unincorporated areas and municipalities served by the MSD on an annual basis, with immediate threats reported as identified.

2.0 Responsibility of the Greater Salt Lake Municipal Services District and Flood Control Engineering/Public Works Engineering Divisions

2.1 The County Flood Control Engineering/Public Works Engineering will report to the Health Department any incidents involving spills, releases or the discharge of pollutants, contaminants or wastes into the gutters and stormdrains including any evidence of spills discovered during routine Dry-Weather Screening within unincorporated areas and municipalities served by the MSD covered by the permit;

2.2 Incidents within the unincorporated areas and municipalities served by the MSD will be reported immediately to the Health Department 24 Hour Hot line at (801) 580-6681 or to (385) 468 -3862 during regular business hours;

2.3 Flood Control Engineering/Public Works Engineering offices shall participate with the Health Department in investigating or the enforcement action within unincorporated areas and municipalities served by the MSD initiated by the Health Department;

2.4 Participation shall include but not be limited to information regarding permits, stormwater systems and mapping, tracking spills or stormdrain systems, dye testing and recommendations for the extent of clean-up in the stormdrain system within unincorporated areas and municipalities served by the MSD;

2.5 The Greater Salt Lake Municipal Services District will handle the Stormwater Pollution Prevention Permitting approvals and enforcement in accordance with the UPDES permit within the unincorporated areas and municipalities served by the MSD per the existing contract. Planning and Development Services will follow-up on conditions identified during restaurant and other applicable inspections that may lead to stormwater violation. Follow-up reports will be sent to the Health Department to document correction of the violations within the unincorporated county and municipalities served by the MSD;

2.6 The Greater Salt Lake Municipal Services District shall manage the construction and post construction activities related to stormwater and the UPDES Permit including engineering controls. Related activities include but are not limited to plan approvals, installation and post construction inspections, management and maintenance of engineered controls within the unincorporated areas and municipalities served by the MSD;

3.0 Coordination & Training

3.1 Representatives of the Parties will participate in the investigation and enforcement of the alleged violations of the Health Regulations and Rules within the unincorporated areas and municipalities served by the MSD. Ordinances to protect storm sewers and drains as required by the UPDES Stormwater Discharge Permit. In addition, the parties shall confer to determine an appropriate legal remedy on a case-by-case basis, including administrative, civil and criminal actions;

3.2 The Parties agree to pursue training resources with the goal of improving water quality, environmental enforcement, public awareness and compliance.

4.0 **EFFECTIVE DATE**

4.1 This M.O.U shall continue in effect until terminated by either party giving six (6) months written notice in advance to the other party's designated representative.

Gary Edwards, Executive Director

Salt Lake County Health Department

Scott Baird

Digitally signed by Scott Baird
Date: 2020.10.19 16:45:56 -06'00'

Scott Baird, P.E., Director

Salt Lake County Public Works Department

Kade Moncur, P.E., C.F.M., Director

Salt Lake County Flood Control Engineering Division

Bart Barker, General Manager

Greater Salt Lake Municipal Services District