Illicit Discharge Detection and Elimination Program Manual

June 2011

V 1.1 March 2012

Prepared by:
City of Kenmore
Richard Sawyer
Department of Engineering Services

TABLE OF CONTENTS

FOREWORD

The City of Kenmore Illicit Discharge Detection and Elimination Program Manual was developed to comply with requirements of the Federal Clean Water Act-National Pollutant Discharge Elimination System Program and the Western Washington Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology to the City of Kenmore in 2007. The intent of this manual is to describe the policies and procedures in place to reduce illicit discharges into the City's municipal separate storm sewer system (MS4). This manual is intended to be a "living document" and may be subject to frequent updates in order to maintain relevance.

ACKNOWLEDGEMENTS

City of Kenmore, Engineering Services
Richard Sawyer, Surface Water Program Specialist

DOCUMENT INFO

CREATED
6/22/2011

VERSION 1.0
6/22/2011

Reviewed:

Richard Sawyer
Surface Water Program Specialist

UPDATE – VERSION 1.1

Date	Date
Signature	Signature
Name (Print)	Name (Print)
Title	Title

UPDATE – VERSION 1.2

Date	Date
Signature	Signature
Name (Print)	Name (Print)
Title	Title

OVERVIEW

Since the passage of the federal Clean Water Act, requirements for cities and counties to control the quality of stormwater runoff have become more stringent. In particular, Kenmore was issued a Western Washington Phase II Municipal Stormwater Permit (Permit) from the Washington State Department of Ecology (Ecology) in 2007. The Permit requires that the City develop an Illicit Discharge Detection and Elimination program. This document, the Illicit Discharge Detection and Elimination Program Manual is intended document compliance with these requirements and is a component of the SWMP.

DOCUMENT STRUCTURE

The Permit, which can be downloaded in its entirety on Washington State Department of Ecology's webpage, outlines six sections of O&M requirements that must be implemented throughout the cycle of the Permit.

Section 1 describes program elements meeting the requirements set forth in section S5.C3.a of the Permit, pertaining to the City's municipal storm sewer system mapping program.

Section 2 describes program elements meeting the requirements set forth in section S5.C3.b of the Permit, pertaining to the City's IDDE and water quality ordinances and codes.

Section 3 describes program elements meeting the requirements set forth in section S5.C3.c of the Permit, pertaining to the City's program addressing illicit discharges, connections and spills.

Section 4 describes program elements meeting the requirements set forth in section S5.C3.d of the Permit, pertaining to the City's IDDE outreach and education efforts.

Section 5 describes program elements meeting the requirements set forth in section S5.C3.e of the Permit, pertaining to the City's IDDE program evaluation efforts.

Section 6 describes program elements meeting the requirements set forth in section S5.C3.f of the Permit, pertaining to the City's IDDE training efforts.

ACRONYMS AND DEFINITIONS

AKART means "All Known and Reasonable Technologies"

BMP means Best Management Practice.

Best Management Practice means a schedule of activities, prohibitions of practices, physical structures, maintenance procedures and other management practices undertaken to reduce or prevent increases in runoff quantity and pollution.

CESCL means Certified Erosion and Sediment Control Lead.

Certified Erosion and Sediment Control Lead means an individual who has satisfied the requirements set forth in Ecology's Stormwater Management Manual for Western Washington (Volume II, Chapter 4, BMP C160) for the designation of certified erosion and sediment control lead.

Ecology means the Washington State Department of Ecology.

ESC means Erosion and Sediment Control.

Facility means drainage facilities, including either flow control or water quality facilities.

Flow Control Facility means a drainage facility designed to mitigate the impacts of increased surface and storm water runoff generated by site development in accordance with the drainage requirements in KMC Chapter 13.35. Flow control facilities are designed either, to hold water for a considerable length of time and then release it by evaporation, plant transpiration, or infiltration into the ground, or to hold runoff for a short period of time and then release it to the conveyance system.

IDDE means Illicit Discharge Detection and Elimination

Maintenance (also Operations and Maintenance) means those usual activities taken to prevent a decline, lapse, or cessation in the use of currently serviceable structures, facilities, equipment, or systems if there is no expansion of the structure, facilities, equipment, or system and there are no significant hydrologic impacts. Maintenance includes the repair or replacement of non-functional facilities and the replacement of existing structures with different types of structures, if the repair or replacement is required to meet current engineering standards or is required by one or more environmental permits and the functioning characteristics of the original facility or structure are not changed.

NPDES means National Pollutant Discharge Elimination System.

National Pollutant Discharge Elimination System means the part of the federal Clean Water Act which requires point source discharges to obtain permits. These permits, referred to as NPDES permits, are administered by the Washington State Department of Ecology.

OMPPM means Operations and Maintenance Policies and Procedures Manual.

O&M means Operations and Maintenance. See Maintenance.

RRMPG means Regional Road Maintenance Endangered Species Act Program Guidelines.

Regional Road Maintenance Endangered Species Act Program Guidelines means the manual developed by the Regional Road Maintenance Technical Working Group that provides a consistent, Regional Program that can be used by any agency wishing to limit, reduce or eliminate the prohibition on take of threatened species under the 4(d) Rule (NMFS), special 4(d) rule and/or Section 7 take exemption (USFWS).

SPPM means the Stormwater Pollution Prevention Manual.

Stormwater Pollution Prevention Manual means the manual referenced in KMC 13.45, Water Quality, including supporting documentation referenced or incorporated in the manual, describing best management practices and procedures for eliminating or reducing surface, storm and ground water contamination from existing facilities and existing and new activities not covered by the SWDM.

SWDM means 2009 King County Surface Water Design Manual.

SMMWW means the 2005 Ecology Stormwater Management Manual for Western Washington.

Water Quality Facility means a drainage facility designed to reduce pollutants once they are already contained in surface and storm water runoff. Water quality (WQ) facilities are a structural component of best management practices (BMPs). When used singly or in combination, WQ facilities reduce the potential for contamination of both surface and ground waters.

WQ means water quality.

SECTION 1 – MS4 MAP

The City maintains a map of the MS4 in Geographical Information System (GIS) software provided by Environmental Systems Research Institute, Inc (ESRI). The City's Permit requires mapping of the MS4, including;

- Outfalls (>24") including tributary conveyances, associated drainage area and land use;
- Structural stormwater BMPs;
- All connections authorized after February 16. 2007;
- Geographical areas served by the MS4 that do not discharge stormwater to surface waters; and
- Maps are available to Ecology upon request.

The City has mapped the entire MS4 including all visible conveyances regardless of size. In addition, most private systems discharging into the MS4 have also been mapped. Surface water maps can be found in Appendix B and are also available on the City's website for download.

SECTION 2 – WATER QUALITY ORDINANCE

The United States defines an Illicit Discharge as any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities (40 CFR 122.26(b)(2)).

Revised Code of Washington State (RCW) Chapter 90.48.080 states: It shall be unlawful for any person to throw, drain, run, or otherwise discharge into any of the waters of this state, or to cause, permit or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter.

The City of Kenmore adopted much of King County's water quality code upon incorporation in 1998, which prohibited the discharge of contaminants into surface, storm water, ground water or the Puget Sound (Chapter 13.45 Kenmore Municipal Code (KMC)). On November 2, 2009 the City of Kenmore Council passed Ordinance 09-0299, which updated Chapter 13.45 KMC to standards set forth in the City's Permit. The remainder of this section summarizes Chapter 13.45 KMC. The full text of Chapter 13.45 KMC can be found in Appendix A or on the City's webpage.

2.1 Prohibited Discharges

Chapter 13.45.030(A) KMC prohibits the discharge of any contaminants into surface and storm water, ground water or the Puget Sound. Contaminants include, but are not limited to, the following:

a. Trash or debris;
b. Construction materials;
c. Petroleum products (oil, gasoline, grease, fuel oil, heating oil, etc…);
d. Antifreeze and other automotive products;
e. Metals in either particulate or dissolved form;
f. Flammable or explosive materials;
g. Radioactive materials;
h. Batteries;
i. Acids, alkalis, or bases;
j. Paints, stains, resins, lacquers, or varnishes;
k. Degreasers and solvents;
l. Drain cleaners;
m. Pesticides, herbicides, or fertilizers;
n. Steam cleaning wastes;
o. Soaps, detergents, or ammonia;
p. Swimming pool backwash;
q. Chlorine, bromine, and other disinfectants;
r. Heated water;
s. Domestic animal wastes;

t. Sewage;
u. Recreational vehicle waste;
v. Animal carcasses;
w. Food wastes;
x. Bark and other fibrous materials;
y. Collected lawn clippings, leaves, or branches;
z. Silt, sediment, or gravel;
aa. Dyes (except as stated in 13.45.030(D)(1));
bb. Chemicals not normally found in uncontaminated water;
cc. Any hazardous material or waste not listed above.

2.2 Allowable Discharges with the application of BMPs

Certain discharges are allowed with the application of appropriate Best Management Practices (BMPs). These discharges could apply to certain business and residential activities that have the potential to contribute contaminants to surface and storm water, ground water or Puget Sound.
To prevent a prohibited discharge, BMPs from the Stormwater Pollution Prevention Manual (SPPM), or supplemental BMPs as determined by the City Manager, shall be applied to the activity. Common activities identified in the SPPM that might result in prohibited discharges include, but are not limited to, the following:

1. Potable water line flushing;
2. Dust control with water;
3. Automobile and boat washing;
4. Pavement and building washing;
5. Swimming pool and hot tub maintenance;
6. Vehicle and equipment repair and maintenance;
7. Building repair and maintenance;
8. Landscaping activities and vegetation management;
9. Hazardous waste handling;
10. Solid and food waste handling; and
11. Application of pesticides or other chemicals (other than landscaping maintenance).

2.3 Allowable Discharges

The following discharges are not considered prohibited discharges unless the City Manager determines that the type of discharge, whether singly or in combination with other discharges, is causing significant contamination of surface and storm water, ground water or Puget Sound:

1. Spring Water;
2. Diverted stream flows;
3. Uncontaminated water from crawl space pumps, foundation drains, or footing drains;
4. Pumped ground water flows that are uncontaminated;
5. Materials placed as part of an approved habitat restoration or bank stabilization project;
6. Natural uncontaminated surface water or ground water;

7. Flows from riparian habitats and wetlands;
8. Collected rainwater that is uncontaminated;
9. Uncontaminated ground water that seeps into or otherwise enters storm water conveyance systems;
10. Air conditioning condensation;
11. Irrigation water from agricultural sources that is commingled with storm water runoff; and
12. Other types of discharges as determined by the City Manager.

2.4 Prohibited Discharges Exceptions

Exceptions are provided for prohibited discharges including:

1. Dye testing is allowable but requires verbal notification to the City Manager at least one day prior to the date of test;
2. A person is not in violation for a prohibited discharge if:
    a. That person has properly designed, constructed, implemented and is properly maintaining BMPs and is carrying out AKART (all known and reasonable technologies), but contaminants continue to enter surface and storm water or ground water; or
    b. That person can demonstrate that there are no additional contaminants being discharged above the background conditions of the water entering the site.
3. A person who has properly designed, constructed, implemented and maintained BMPs is still liable for any prohibited discharges through illicit connections, dumping, spills or other discharges not addressed by said BMPs.
4. Emergency response activities

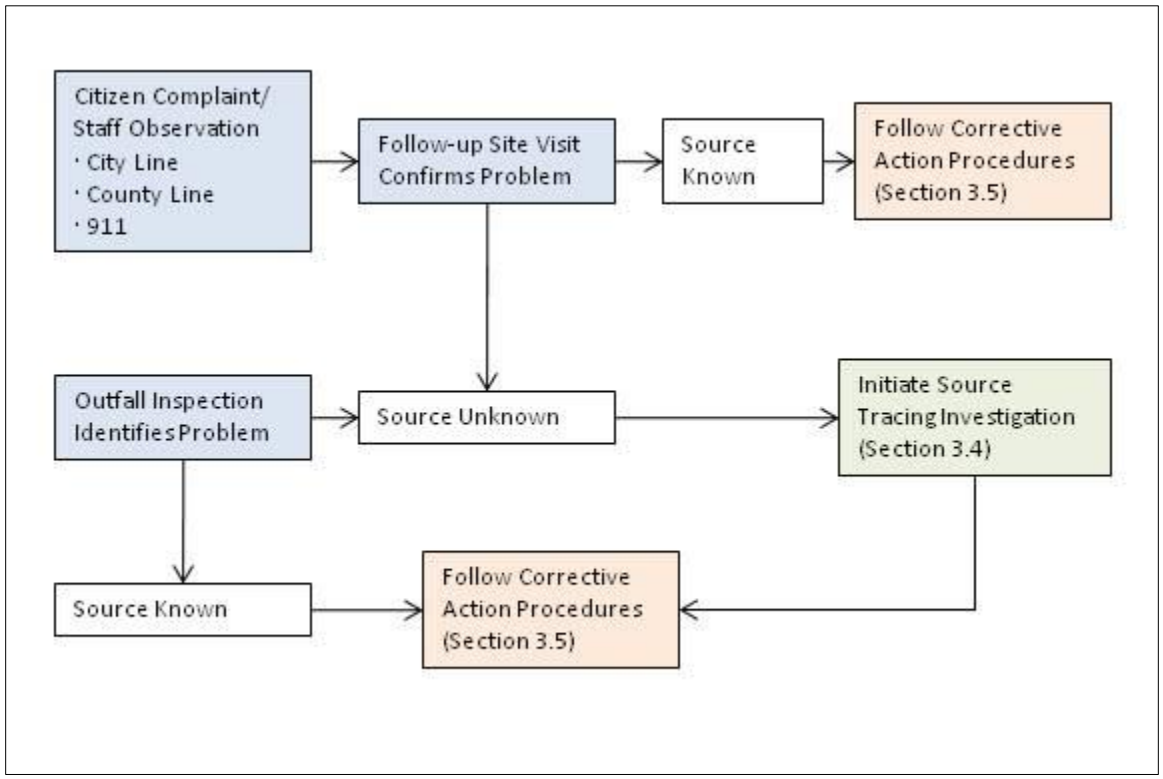
2.5 Stormwater Pollution Prevention Manual

The City adopted the Kenmore Stormwater Prevention Manual to provide BMPs for commercial, multi-family and residential properties covering a broad spectrum of activities that have the potential to create prohibited discharges. To obtain the full text of the Stormwater Pollution Prevention Manual please visit the City webpage at www.kenmorewa.gov or come to City Hall.

2.6 Enforcement

The City uses public education, warnings, technical assistance and the implementation of BMPs, and when necessary, AKART, as the primary methods of gaining compliance with Chapter 13.45 KMC. If necessary, civil penalties may be required for compliance.

SECTION 3 – IDDE PROCEDURES



3.1 – Locating Priority Areas

Priority areas more likely to have illicit discharges in the City are determined by evaluating;
Associated land uses,
Associated business/industrial activities,
Historical complaints in the area,
Storage of large quantities of materials that could result in spills,
Residential lots with swimming pools, and
Multi-family lots.

High priority areas are associated with commercial, industrial and multifamily parcels that have a high percentage of impervious area, are subject to vehicular traffic, may store or deal with large quantities of materials that could cause illicit discharges. Residential parcels with swimming pools also have potential for illicit discharges.

3.2 – Outfall Reconnaissance Inventory

The City conducts Outfall Reconnaissance Inventories (ORI) to visually inspect each known outfall from the City's MS4 to identify areas of obvious pollution or non-stormwater discharges. Outfall inspections locate potential problem areas without the need for in-depth laboratory analysis. Potential problem discharges can be identified by outfalls that are flowing during dry weather (potential illicit connection)

or outfalls that have high turbidity, strong odors, unusual colors or those that trigger indicator parameters such as high Fluoride, ammonia/potassium ratios, surfactants or fecal coliform levels. The City utilizes the Illicit Discharge Detection and Elimination: A Guidance Manual (Center for Watershed Protection, October 2004) when conducting an ORI. Please refer to this manual for more detailed information.

3.2.1 Prioritization Schedule

The City's MS4 map currently includes over 250 known outfalls. Even with detailed mapping, the City found several additional outfalls during ORIs conducted in 2010 and 2011 so it is expected that this number will increase as future ORIs are conducted.

The Permit requires that the City prioritize receiving waters for visual inspection to identify areas most likely to include illicit discharges. Receiving water priorities have been set based on drainage area characteristics and, in the case of Swamp Creek, the presence of a Total Maximum Daily Load (TMDL) which requires that it receive higher priority for visual inspection.

The Permit requires the City to visually inspect outfalls in three high priority receiving waters by February 16, 2011 and one high priority receiving water each year after. The ORI requires dry weather to conduct visual inspections which effectively limits the City's timeframe for conducting them to summer.

In summer 2010 the City conducted visual inspections on the main channel of Swamp Creek, Muck Creek, Little Swamp Creek and five tributaries to Swamp Creek. The Permit required the City to place water bodies with a Total Maximum Daily Load (TMDL) as a top priority. Currently, Swamp Creek is the only water body with a TMDL in Kenmore. A copy of the 2010 Swamp Creek ORI report can be found in Appendix C.

In summer 2011 the City conducted visual inspections along the shorelines of Lake Washington and Sammamish River. Most of the City's non-residential properties drain into these two water bodies, therefore, they were placed as the second and third priority for ORI. A copy of the 2011 Sammamish River and Lake Washington ORI can be found in Appendix D.

Future ORIs, if required in future Permits, will include:

- Tributaries (to Lake Washington) 0056, 0222, 0225, 0226 and 0227; and
- Tributaries (to Sammamish River) 0057, Unnamed 1, Unnamed 2 and Unnamed 3.

3.2.2 Responsibility

Inspections are the responsibility of the Surface Water Program Specialist. Inspections may be performed by City staff or by outside consultants hired by the City. In either case, all field reports will be reviewed by the Surface Water Program Specialist.

3.2.3 Timing

Timing is important when scheduling ORI field days. The preferred conditions for outfall inspections include:

- Dry season – preferably in summer or early fall;
- No run-off producing rainfall with last 48 hours; and
- Low vegetation (avoid late spring when access may be hindered by heavy vegetation).

3.2.4 Equipment

Prior to conducting field work, crews should assemble all required equipment and review records from prior inspections in the same area to become familiar with the outfall locations and any potential inspection challenges. Field crews should prepare for consecutive days of field work when possible. The table below shows the equipment and parameters used by the City.

Table 3-2-4
Equipment and Illicit Discharge Indicators

Indicator	Instrument	Method	Accuracy	Range
Temperature	YSI 63	Thermistor Sensor	±0.1°C	
pH	YSI 63	Combination Sensor with Gel Reference	±0.1 unit within 10°C of calibration ±0.2 unit within 20°C of calibration	0-14
Conductivity	YSI 63	Four Electrode Cell Sensor	±0.5% full scale and 0.1 uS/cm resolution	0 to 499.0 us/cm
Salinity	YSI 63	ASTM document *Standard Methods of Test for Electrical Conductivity of Water and Industrial Wastewater*, ASTM Designation D1125-82, and *OIML Recommendation Number 56*	±0.1 ppt	
Turbidity	LaMotte 2020e Turbidity Meter	USEPA Method 180.1	±2% NTU ±3% NTU	0-100 NTU >100 NTU
Ammonia Nitrogen	LaMotte Smart2 Colorimeter	Nesslerization		0.00-4.00 ppm
Fluoride	LaMotte Smart2 Colorimeter	SPADNS		0.00-2.00 ppm
Potassium	LaMotte Smart2 Colorimeter	Tetraphenylboron		0.0-10.0 ppm
Surfactants	LaMotte Smart2 Colorimeter	Ion Pair Estraction-Bromophenol Blue Indicator		0.5-8.0 ppm as Linear Alkyl Sulfonates (LAS)
Fecal Coliform	AMTEST Labs	SM9222D		

3.2.5 Activities

During ORI field days, field crews visually inspect each outfall and the immediate surrounding area. For flowing outfalls, crews will photograph the current conditions and complete the ORI Field Sheet.

Potential problems are indicated by outfalls that are flowing in dry weather and/or foul odors or discolored water in or around the outfall pipe. Groundwater sources can potentially be ruled out by testing for the absence of fluoride or chlorine in the discharge.

When illicit discharge problems are identified field crews will photograph the problem area and conduct an inspection of the surrounding are to identify any obvious pollution sources. These simple actions can give valuable direction to the upcoming IDDE inspection. Field crews should also report problem areas to the Surface Water Program Specialist within 24 hours of completing the field investigation.

During field inspections, crews should also note whether the outfalls have maintenance issues, such as trash around the outfall or damaged infrastructure that should be brought to the attention of Public Works. Observed spills or environmental hazards should be immediately reported to the Surface Water Program Specialist. The Surface Water Program Specialist will work with property owners to clean and dispose of spills or have Public Works clean up and dispose spills in the right-of-way.

3.3 – Discharge Characterization

Table 3-3 characterizes the nature of illicit discharges and outlines priority levels to assist City staff in determining the appropriate response time for initiating a source investigation after a problem is identified in the field. Priority levels are based on the suspected pollutant source(s) of a reported problem. According to the Permit, illicit discharge investigations should begin within seven days of identifying a problem. In most cases, the City responds faster than the required timeline.

Table 3-3
Source Investigation Priority Levels

Priority Level	Suspected Pollutants		Response Time (Work Days)
1	• Alkalis • Automotive Products • Bases • Cleaning Products • Degreaser or Solvent • Drain Cleaner • Fertilizer • Flammable/Explosive Materials	• Herbicide • Metals • Painting Products • Pesticide • Petroleum • Process Wastewater • Sewage • Unknown Chemicals	1-2
2	• Ammonia • Construction Runoff (Silt, Sediment, Gravel)	• Detergents • Food Waste (FOG) • Soap	3-5
3	• Car Washing • Pressure Washing Waste • Spa or Pool Water	• Steam Cleaning • Yard Waste	5-7
4	• Animal Carcasses • Bacteria • Construction Materials • Debris	• Foam • Rust • Trash • Other	10

3.4 – Discharge Source Tracing

This section outlines the basic tools that can be used to trace the source of a suspected illicit discharge. Source tracing begins when a suspected problem area is identified through the ORI, field assessment/testing or other methods of notification. When the source of the non-stormwater discharge is not known, one of two primary methods can be used to locate the source of an illicit discharge:

- Method A – Storm Drain Network Investigations
- Method B – Drainage Area Investigation

The method used will depend on the type of information collected or reported, level of understanding of the drainage network and existing knowledge of operations and activities on the surrounding properties.

3.4.1 Work Order

When problems are identified a work order should be opened and assigned a work order number, creation date, case description and the primary staff contact. The work order contains any known pertinent information such as location, person responsible and tracking information related to the observed or suspected problem. The investigator assigned to the work order shall keep an accurate log of labor, materials and costs associated with the investigation for invoicing the responsible party. The work order should be opened prior to completing any additional field work unless the nature of the discharge necessitates immediate response. The file should include copies of the following, if applicable:

- Copy of Outfall Inspection Report;
- Photographs;
- Additional field notes;
- Lab testing results;
- Compliance letters sent and responses received;
- Correspondence (mail, email, telephone logs);
- Proof of corrected problems.

Any field investigations, photographs, corrective actions or other activities associated with the suspected problem area should be documented in the work order. This becomes the City's official record of the IDDE investigation.

3.4.2 Method A – Storm Drain Network Investigations

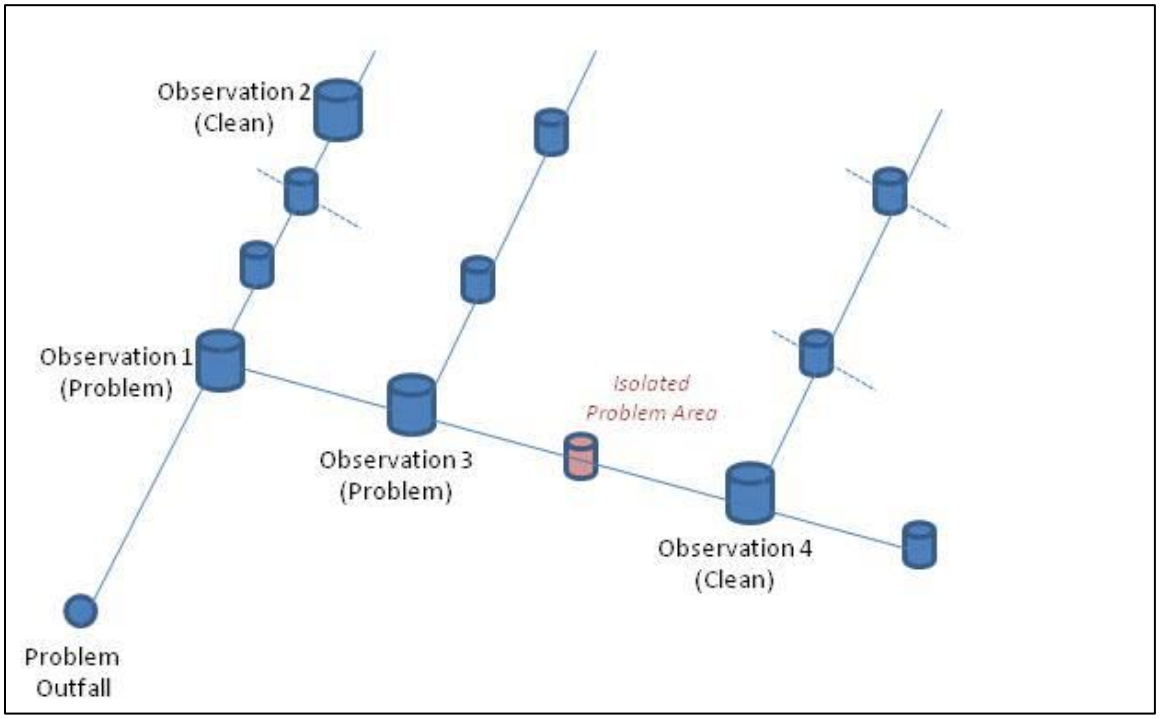
The source of some illicit connections or discharges can be located by systematically isolating the area from which the polluted discharge originates. This method involves progressive investigation at catch basins in the storm drain network to narrow down the location where the illegal discharge is entering the drainage system. This method is best used to identify constant or frequent discharge sources such as an illicit connection from a sewer system of sink drain into the storm drainage network. One-time illegal discharges (such as a surface spill or intentional dumping into the storm drain system) should be investigated using Method B described later in this section.

Field crews should work progressively upstream from the outfall and inspect catch basins until indicators reveal that the discharge is no longer present. Catch basin observations can be time-consuming, but they are generally a necessary step before conducting other tests. In particularly large storm drain systems, it may be helpful to first identify major branches of the system and test one catch basin at the downstream end of each branch. This can help to reduce the area that must be investigated.

Storm drain network investigations include the following steps:

1. Consult the drainage system map (if available) and identify the major branches.
2. Starting from the outfall, observe the next upstream catch basin or junction to see if there is evidence of polluted discharge. As with the outfall inspections, field crews are looking for the presence of flow during dry weather, foul odors, colors or stained deposits, oily sheens, floatable materials, etc...
3. Repeat observations at each upstream catch basin or junction until a junction is found with no evidence of discharge; the discharge source is likely located between the junction with no evidence of discharge and the next downstream junction.
4. Work downstream from the "clean" catch basin or junction to isolate the location where the polluted discharge is entering the storm drain system.
5. If discharge is evident from private property initiate then begin efforts to contact property owner. If there is an immediate danger to the public and environment then the City may initiate a response right away.
6. Document all information in the work order.

Figure 3-4-2 shows the observation steps to isolate the location where an illicit discharge is entering the storm drainage network.



When visual inspections are not enough to isolate the source of the illegal discharge, a number of additional field tests can be performed. These include:

- Dye Testing,
- Video Inspections, and
- Smoke Testing.

The Center for Watershed Protection's Illicit Discharge Detention and Elimination: A Guidance Manual provides more detailed instructions for employing these testing techniques. The manual can be found on the U.S. Environmental Protection Agency's webpage. City staff will also have hard copies available at City Hall.

Confirmed illicit discharge sources should be referred to the follow-up actions and corrective action procedures described under section 3.5.

3.4.3 Method B – Drainage Area Investigations

The source of some illegal discharges can be determined through a survey or analysis of the drainage area of the problem outfall. Drainage area investigations are particularly useful when the discharge observed at the outfall has a distinct or unique characteristic that can allow field crews to quickly determine the type of activity or non-point source that is generating the discharge (see table 3-4-3). However, drainage area investigations are generally not helpful in tracing sewage discharges, since they are not related to a specific land use.

Table 3-4-3
Common Discharges and Potential Sources

Observed Discharge	**Potential Causes**
Clogging Sediment	Construction activity without proper erosion and sediment controls Roadway sanding operations Outdoor work areas or material storage areas
Thick Algae Growth	Fertilizer leak or spill Landscaping operations Hydroseeding following construction Failing or leaking septic system
Oil	Refueling operations Vehicle or machinery maintenance activities
Sudsy Discharge	Power washing of buildings Vehicle or equipment washing operations Mobile cleaning crew dumping Laundry or Cleaner Household greywater discharge
Clogged Grease	Restaurant sink drain connection to stormwater system
Sewage	Failing or leaking septic systems

Staff should make a list of likely discharge sources and consult City land use and drainage system maps to identify areas of likely pollution sources near the storm drain network. Field crews should then conduct a windshield survey of the drainage area to confirm and identify potential sources of the discharge. Once potential discharge sites are identified, City staff should conduct individual site

inspections to locate the specific source of the illegal discharge. In some cases, dye testing may be needed to confirm that a suspected activity is actually draining into the storm drainage network.

3.4.4 Equipment

Prior to conducting field work, crews should assemble all required equipment (see table 3-4-4) and review the outfall inspection records or work orders from the area to become familiar with the background information and potential sources.

Table 3-4-4
Field Equipment for Source Tracing

2 Person Crew (Recommended)	Machete, Clippers
Safety Gear (Vest, hard hat, cones)	Flash Light (Headlamp)
Field Notebook, Pencils	Tool Box (hammer, tape measure, duct tape, zip ties)
Map or Aerial Photo of Area	CB Grate Hook, CB grate Allen Wrench
GPS Unit (Trimble YUMA)	Spray Paint
Cell Phone (Charged battery)	First Aid Kit
Digital Camera (Charged Battery)	Compass

3.4.5 Analytical Sampling (if needed)

If illicit discharge sources cannot be identified based on storm drainage network investigations and/or drainage area investigations, the Surface Water Program Specialist may request that water samples be collected from potential problem discharges and sent to the lab for analytical testing. The results of lab tests may isolate the source or type of illegal discharge. Lab tests may also be important for documentation in the event that an enforcement action must be taken against a tenant or property operator. Table 3-4-5 shows the recommended water quality testing parameters.

Table 3-4-5
Water Quality Test Parameters and Uses

Water Quality Test	Use of Water Quality Test	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes
Temperature	Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures.	⊙	N/A	N/A	⊙
pH	Extreme pH values (high or low) may indicate commercial or industrial flows. Not useful in determining the presence of sanitary wastewater (tends to have a neutral pH like uncontaminated base flows)	○	⊙	○	⊙

Table 3-4-5 Continued					
Water Quality Test	**Use of Water Quality Test**	**Sewage**	**Washwater**	**Tap Water**	**Industrial or Commercial Liquid Wastes**
Conductivity	Used as an indicator of dissolved solids. Used to distinguish between seawater and stormwater.	⊙	⊙	○	⊙
Salinity					
Turbidity		⊙	⊙	○	⊙
Ammonia	High levels can be an indicator of the presence of sanitary wastewater.	●	⊙	○	⊙
Fluoride	Indicates presence of potable water.	○	○	●	⊙
Potassium	High levels may indicate the presence of sanitary sewer.	⊙	○	○	●
Surfactants	Indicates the presence of detergent (e.g. laundry, car washing)	●	●	○	⊙
Fecal Coliform	Indicates presence of bacteria found in sanitary sewer or septic systems.	⊙	○	○	○

Source: *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* (Center for Watershed Protection, October 2004)

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g. tap water or natural water). For tap water, can distinguish from natural water.

⊙ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter.

○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water.

N/A Data are not available to assess the utility of this parameter for this purpose

Results from analytical testing should be recorded in the work order and reported to the Surface Water Program Specialist. Testing results may lead to another round of field investigations using either Method A or B. All data shall be recorded in the work order.

3.4.6 Follow-Up Actions

Once the source of an illicit discharge has been identified, field staff should initiate private property site entry procedures (if needed), notify the property owner or operator of the problem and provide the appropriate educational materials and/or a copy of KMC 13.45. This is an important first step in the corrective action process. Field staff should also notify the Surface Water Program Specialist, and update any information in the work order. The Surface Water Program Specialist and Code Enforcement Officer can then begin working though the corrective action steps outlined in section 3.5.

3.5 – Discharge Removal/Corrective Action

3.5.1 Purpose

The City responds to identified illicit discharges, illicit connections or illegal dumping activities with an escalating level of enforcement response. Corrective actions will initially focus on education to promote voluntary compliance and then escalate to increasingly severe enforcement actions if voluntary compliance is not obtained. The Surface Water Program Specialist and Code Enforcement Officer should use judgment in exercising the right mix of compliance assistance and enforcement to correct identified problems. The City may immediately levy fines if the violation is found to be willful, intentional or egregious.

In the event the violation constitutes an immediate danger to public health or safety, the City is authorized to enter upon the subject property and take any and all measures necessary to abate the violation and/or restore the property. Any expense related to such remediation shall be fully reimbursed by the property owner and/or responsible party to the City.

3.5.2 Voluntary Compliance

The preferred approach to address illicit discharge problems is to pursue voluntary compliance through property owner of responsible party education. Often, business operators and property owners are not aware of the existence of illicit connections or activities on their properties that may constitute an illegal discharge. In these cases, providing the responsible party with information about the connection or operation, the environmental consequences and suggestions on how to remedy the problem may be enough to secure voluntary compliance.

Education begins during the site investigation when the operation or connection is first confirmed. Property owners and operators should be notified that the problems must be corrected in a timely manner and that the City will be conducting a follow-up site visit to verify compliance. Field staff should also provide the property operator with Stormwater Pollution Prevention Manual BMP documents (if applicable).

3.5.2.1 Operational Problems

Property owners are responsible for correcting operational problems that are leading to illicit discharges to the storm drainage system. This could include moving washing activities indoor or under cover, covering material storage areas, locating an appropriate discharge location for liquid wastes or other operational modifications. Through site visits and education, the City can provide technical assistance to aid property owners in identifying the required modifications.

3.5.2.2 Structural Problems

Illicit connection problems may require a structural modification to correct the problem. Structural repairs can be used to redirect discharges such as sewage, industrial and commercial cross-connections. Such cross-connections must be re-routed to an approved sanitary sewer system. Correcting structural problems in the responsibility of the property owner, though the City may provide technical assistance throughout the process.

3.5.3 Enforcement Actions

When voluntary compliance does not produce the desired results, the City is required to pursue follow-up enforcement action. All enforcement actions will be the responsibility of the Surface Water Program Specialist and Code Enforcement Officer. Table 5-3 outlines the detailed enforcement steps. More serious violations or continued non-compliance may warrant a more aggressive, enforcement oriented approach.

Table 5-3
City of Kenmore IDDE Enforcement Steps

Preliminary Actions		Open Work Order ↓	
		Investigation of Polluted Structure or Reported Problem ↓	
		Confirm Problem Determine Responsible Party ↓	
Step 1 **Initial Actions**	↓ Flagrant Act and/or Poses Danger to Public Skip to Step 3	Alert Owner to Problem Distribute Educational Material ↓	
		Encourage Voluntary Compliance ↓	
		Send Summary Letter and Provide Technical Support ↓	
		Follow-up Site Visit to Verify Compliance ↓	→ Problem Corrected ↓ Close Work Order
Step 2 **Follow-up Actions**		Problem Persists ↓	
		Send Notice of Violation Letter with Compliance Date ↓	
		Follow-up Site Visit to Verify Compliance ↓	→ Problem Corrected ↓ Close Work Order
Step 3 **Final Actions**		Problem Persists ↓	
		Send Second Notice of Violation Letter ↓	
		City Corrects Structural Problems at Owner Expense ↓	
		Assess fines and/or Civil Penalties ↓	→ Close Work Order
		Refer Unresolved Problems to City Manager and City Attorney	

3.5.3.1 Enforcement Timelines

The timeline of corrective action procedures is highly dependent on the nature of the violation and the responsiveness and cooperation from the person(s) responsible. The urgency of addressing identified problems will be based on the nature of the pollutant in question and potential impacts to downstream waters. Compliance dates should be included in all violation notices.

The Permit requires identified problems to be corrected and illicit connections removed within 180 days of identifying the source. If property owners are not addressing problems in a timely manner, the City may step in and perform the repairs necessary to remove an illicit connection, eliminate an illicit discharge and/or clean-up a dumping incident. Property owners will also be responsible for reimbursing the City for any costs occurred in correcting IDDE problems.

3.5.3.2 Potential Fines and Civil Penalties

Illicit Discharge violations are subject to fines and penalties under Chapters 1.15, 1.20 and 13.45 KMC and other enforcement provisions adopted by rule.

Fines and penalties include;

- An amount reasonably determined to be equivalent to the economic gain as a result of the violation (Chapter 13.45 KMC), and
- An amount, up to $25,000, that is reasonably based upon the gravity and nature of the violation (Chapter 13.45 KMC), and
- Reimbursement of all costs incurred by the City in response to the violation (Chapters 13.45 & 1.20 KMC), and
- Responsible person(s) is guilty of a misdemeanor (Chapter 1.15 KMC), and
- Monetary fines of $250.00 per day that violation occurs up to $5,000 (Chapter 1.15 KMC), and
- Imprisonment up to one year (Chapter 1.15 KMC).

3.5.3.3 Record Keeping

Effective enforcement procedures require comprehensive recordkeeping and documentation to show that all program steps have been followed. Throughout the problem investigation and corrective action activities, all information related to the incident or property in question should be documented in the work order. Section 5 discusses illicit discharge record keeping in greater detail.

SECTION 4 – EDUCATION

The Permit requires the City to inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste.

4.1 Employee Education

Field personnel are trained on identifying potential illicit discharges and connections. Personnel responsible for conducting investigations or inspections are trained accordingly.

4.2 General Public Education

The City has implemented many programs aimed at educating the general public on how stormwater drainage systems operate and the hazards associated with polluting runoff. Educational demonstrations and material are presented at community events by City staff. Educational material is also provided to Kenmore residents via newsletters, online media and public transportation advertisements. School children in Kenmore are provided curriculum on surface water management and the hazards of water pollution.

4.3 Business Education

The City has adopted the Kenmore Stormwater Pollution Prevention Manual (SPPM). The SPPM identifies Best Management Practices (BMPs) for commercial, multi-family and residential properties for activities that have the potential to contaminate surface, storm or groundwater.

The City conducts Water Quality Audits for commercial and multi-family properties as needed or in response to inspection findings. Water Quality Audits provide assistance to property owners and assures that BMPs are correctly chosen and implemented.

SECTION 5 – TRACKING

The City tracks the number and type of illicit discharges, including spills, identified; inspections made; and any feedback received from public education efforts. Details of all IDDE and water quality work orders are tracked in the City's work order system.

SECTION 6 – TRAINING

Staff responsible for identification, investigation, termination, cleanup and reporting of illicit discharges, including spills and illicit connections are trained to conduct these activities. Additionally, field staff that as part of their normal job responsibilities might come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4 are trained on the identification of an illicit discharge/connection and on the proper procedures for reporting and responding to the illicit discharge/connection. Follow-up training to all field staff is provided as needed. Training logs are maintained by the Surface Water Program Specialist at City Hall.

APPENDIX A – CHAPTER 13.45 KENMORE MUNICIPAL CODE

APPENDIX B – SURFACE AND STORM WATER MAPS

APPENDIX C – 2010 OUTFALL RECONNAISANCE INVENTORY (ORI)

APPENDIX D – 2011 OUTFALL RECONNAISSANCE INVENTORY (ORI)