

Stormwater Management Program Plan



Independence Grove Forest Preserve - Libertyville, IL

Photo by: Sharon Doty

CITY OF NORTH CHICAGO
LAKE COUNTY, ILLINOIS

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SMPP

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1 Overview of the Stormwater Management Program Plan



Des Plaines River – Lake County, IL Photo by Dave Piasecki

1.1 Introduction

This Stormwater Management Program Plan (SMPP) was developed by the City of North Chicago based off a SMPP template provided by the Lake County Stormwater Management Commission. The purpose of the SMPP is to meet the minimum standards required by the United States Environmental Protection Agency (USEPA) under the National Pollutant Discharge Elimination System (NPDES) Phase II program. Federal regulations through the USEPA require that all Municipal Separate Storm Sewer Systems (MS4s), partially or fully in urbanized areas based on the 2000 census, obtain stormwater permits for their discharges into receiving waters. There are many different types of MS4s including municipalities, park districts, drainage districts, township highway departments, counties and county and state transportation departments (LCDOT and IDOT).

The SMPP describes the procedures and practices that can be implemented by the City of North Chicago toward the goal of reducing the discharge of pollutants within stormwater runoff in order to comply with Federal standards. Compliance with the plan is intended to protect water quality thus contributing to the following amenities:

- cleaner lakes and streams,
- improved recreational opportunities and tourism,
- flood damage reduction,
- better aesthetics and wildlife habitat, and

- a safer and healthier environment for the citizens.

The SMPP addresses the primary program elements for all City of North Chicago activities, including the manner in which the City of North Chicago:

- reviews, permits and inspects construction activity within its limits;
- manages the planning, design and construction of projects performed within its limits;
- maintains its facilities and performs its day-to-day operations;
- works toward protecting the receiving waters from illicit discharges;
- provides public education and outreach;
- trains its employees in carrying out and reporting program activities; and
- continually monitors and evaluates the program.

1.2 State & Federal Regulations



Federal environmental regulations based on the 1972 Clean Water Act (CWA) require that MS4s, construction sites and industrial activities control polluted stormwater runoff from entering receiving bodies of water (including navigable streams and lakes). The NPDES permit process regulates the discharge from these sources based on amendments to CWA in 1987 and the subsequent 1990 and 1999 regulations by the U.S. Environmental Protection Agency (USEPA). In Illinois, the USEPA has delegated administration of the Federal NDPES program to the Illinois Environmental Protection Agency (IEPA). On December 20, 1999 the IEPA issued a general NPDES Phase II permit for all MS4s. The General Permit is included in **Appendix 5.16**. Under the General ILR 40 Permit each MS4 was required to submit a Notice of Intent (NOI) declaring compliance with the conditions of the permit by March 10, 2003. The original NOI describes the proposed activities and best management practices that occurred over the original 5-year period toward the ultimate goal of developing a compliant SMPP. At the end of the 5th year (March 1,

2008) the components of the SMPP were required to be implemented; per the ILR40 permit. The IEPA reissued the ILR 40 permit on February 20, 2009 effective April 1, 2009.

Additionally, under the General ILR10 permit also administered by IEPA, all construction projects that disturb greater than 1 acre of total land area are required to obtain an NPDES permit from IEPA prior to the start of construction. Municipalities covered by the General ILR40 permit, are automatically covered under ILR10 30 days after the IEPA receives the NOI from the municipality.

1.3 Countywide Approach to NPDES Compliance

The Lake County Stormwater Management Commission (SMC) is a countywide governmental agency created by county ordinance under the authority of Illinois Revised Statute 55/5-1062. SMC's goals include the reduction of flood damage and water quality degradation. Another purpose of SMC is to assure that new development addresses non-point source pollution, does not increase flood and drainage hazards to others, or create unstable conditions susceptible to erosion. To accomplish this, the SMC works cooperatively with individuals, groups, and units of government as well as serving as the corporate enforcement authority for the Lake County Watershed Development Ordinance. SMC enforces the WDO in non-certified communities on behalf of the municipality. The municipality is responsible for enforcing the WDO in Certified Communities. A municipality is considered a Certified Community after its petition is approved by SMC. SMC utilizes technical assistance, education programs and watershed planning to increase public awareness of natural resources and the impacts of urbanization on stormwater quality. In addition, SMC provides solutions to problems related to stormwater and identifies effective ways of managing natural resources.

In 2002, SMC formed an Ad Hoc Municipal Advisory Committee (MAC) specifically to advise MS4s on the NPDES Phase II Permit program. Municipalities, townships, drainage districts, consultants and county representatives comprise the MAC. SMC advised and assisted the MS4s in preparing their NOIs, but is not a permittee as it does not own or operate any sewer systems.

The General Permit allows for MS4s to take credit for activities being performed by a Qualifying Local Program (QLP) toward meeting its permit requirements. The Lake County Stormwater Management Commission (SMC) is a Qualifying Local Program for MS4s in Lake County. As part of their ongoing services, SMC performs some functions related to each of the six minimum control measures. SMC has been providing services under four of the six minimum control categories since it began implementing a comprehensive, countywide stormwater program in 1991. However, MS4s are required to provide additional services for each of the Minimum Control Measures with the greatest effort in the Illicit Discharge Detection and Elimination and Pollution Prevention/Good Housekeeping categories.

SMC sponsors informative workshops and roundtable discussions. It formed the Municipal Advisory Committee (MAC) to receive input on how SMC can best assist local governments during the permit application process and implementation period. Through these discussions, it was decided that each municipality (or MS4) submit its own "Notice of Intent" (NOI) to be covered under IEPA's statewide general permit. However, using the countywide approach, municipalities may take credit for the programs and ordinances developed by SMC as well as tailor specific local BMP programs for compliance with the Phase II rules.

As part of the countywide approach to comply with the NPDES Phase II program, SMC assists municipalities with the following:

- Supports NPDES II presentations to local boards,
- Develops model Notice of Intent (NOI),
- Provides countywide drainage system overview and receiving waters map,
- Provides general 5-year BMP Plan for NOI,
- Develops specific BMP Measurable Goals and program development tasks,
- Serves as a clearinghouse for all support information and acts as a liaison to IEPA and USEPA,
- Supports an on-going Municipal Advisory Committee (MAC),
- Drafts a model of the Annual Performance Report and specific BMP Measurable Goals for the subsequent years, and
- Provides model Illicit Discharge Ordinance language.
- Provides SMPP Template.

SMC countywide services qualify for credit under four of the six Minimum Control Measures. Additionally, SMC developed the SMPP template for revision/adoption by the MS4s. This template is intended to be reviewed, revised and accepted by MS4s within the county and describes a program intended to be in compliance with the ILR40 permit requirements. A general list below summarizes additional SMC services under the 6 minimum control categories:

1. **Public Education and Outreach:** SMC provides, through its Public Information Coordinator, various training workshops, homeowners workshops, brochures, training manuals, teacher/student education, videos, etc.,
2. **Public Participation and Involvement:** SMC coordinates and participates in public meetings and committees, including the Municipal Advisory Committee (MAC), SMC Board of Commissioners, Technical Advisory Committee (TAC), citizen watershed planning committees, Watershed Management Board (WMB), and volunteer support.
3. **Construction Site Runoff Control:** SMC adopted the countywide Watershed Development Ordinance in 1992, which establishes the minimum stormwater management requirements for development in Lake County. The WDO, which is enforced by SMC as well as by certified communities in the county, establishes standards for construction site runoff control.
4. **Post-Construction Runoff Control:** The Watershed Development Ordinance also establishes standards for post-construction runoff control.

1.4 Organization of SMPP

The SMPP identifies best management practices to be implemented in six different categories. These categories are:

- Public Education and Outreach,
- Public Participation/Involvement,
- Construction Site Runoff Control,
- Post-Construction Runoff Control,
- Illicit Discharge Detection and Elimination, and
- Pollution Prevention/Good Housekeeping.

Chapter 1: Overview of the Stormwater Management Program Plan - discusses the format of the SMPP document and the regulations associated with NPDES II through county, state and federal agencies.

Chapter 2: Program Management - discusses the logistics of the Plan. This includes the organization, implementation and responsible parties necessary to achieve overall compliance with the SMPP and Permit. It also identifies how the City of North Chicago coordinates with other county and state agencies and discusses the legal authority that the MS4s have to implement the Plan components.

Chapter 3: The Program - addresses stormwater pollutant control measures implemented by the City of North Chicago per the six minimum control categories established by the USEPA:

- Public Education and Outreach,
- Public Participation/Involvement,
- Construction Site Runoff Control,
- Post-Construction Runoff Control,
- Illicit Discharge Detection and Elimination, and
- Pollution Prevention/Good Housekeeping.

Chapter 4: Monitoring, Program Evaluation and Reporting - describes the monitoring, evaluation and reporting procedures associated with the program. The SMPP is a guide created to protect the City of North Chicago receiving waters from pollution and resultant degradation. This Chapter assists in identifying best management practices and processes that may require improvement and refinement as the document becomes an effective tool.

Chapter 5: Appendices – including forms, references, exhibits and bibliography.

1.5 Watersheds, Sub-Watersheds and Receiving Waters



Des Plaines River

The City of North Chicago is primarily located within the Lake Michigan Watershed (which includes Pettibone Creek) and the North Branch of the Chicago River (which includes the Skokie River Drainage Ditch). There is one receiving water, tributary to the Lake Michigan, which is located within the east half of the City. This includes Pettibone Creek. There are no receiving waters tributary to the Skokie River Drainage Ditch, which is located within the west half of the city. Lakes and other on-stream bodies of water are also considered part of the receiving water system.

Watershed: The land area that contributes stormwater to one of the four major Rivers in Lake County.

Sub-Watershed: The land area that contributes stormwater to one of the receiving waters tributary to a major River.

Receiving Water: A natural or man-made system into which stormwater or treated wastewater is discharged, including the four major rivers in Lake County, their tributary stream systems and other Waters of the U.S.

The major Watersheds and receiving waters of Lake County found within the City of North Chicago are presented on **Figure 1 Map of Major Sub-watershed and Receiving Waters**.

North Branch of the Chicago River Watershed

The North Branch of the Chicago River watershed area covers an area of about 50 square miles in Lake County, and is the most urbanized of the four major Lake County watersheds. There are three main tributaries of the North Branch Chicago River, each of them having their own subwatersheds: the West Fork subwatershed, the Middle Fork subwatershed, and the Skokie River subwatershed. The North Branch watershed is also a subwatershed of the larger Chicago River Watershed that is formed of the North and South Branches of the Chicago River. The Chicago River Watershed is a sub-basin of the larger Illinois River Watershed.

The North Branch watershed in Lake County roughly extends from Route 132 (Grand Avenue - Waukegan) on the north and continues into Cook County. The western boundary is approximately ½ mile to a mile west of Interstate 94; the eastern boundary follows Green Bay Road. Portions of Gurnee, Park City, Waukegan, North Chicago, Lake Bluff, Green Oaks, Mettawa, Lake Forest, Highwood, Highland Park, Deerfield, Riverwoods, Lincolnshire and Bannockburn make up the North Branch Chicago River watershed.

Completed watershed plans include the North Branch of the Chicago River Watershed-Based Plan, North Branch Open Space Plan and the Skokie River Headwaters/North Chicago Flood Damage Reduction Study.

Lake Michigan Watershed

The Lake Michigan watershed drains 54 square miles of Lake County. Channels in this area generally flow toward the east into Lake Michigan with the western limits at about Green Bay Road. Subwatersheds include Bluff/Ravine, Dead River, Kellogg Creek, Pettibone Creek and Waukegan River.

The topography of the Lake Michigan watershed ranges from gently sloping topography to a steep/ravine bluff system. A coastal beach-ridge plain is located along the lakeshore from the state line south to the Waukegan harbor. The northern third of the watershed has increasingly become suburbanized while the southern third is mostly entirely suburbanized. While the Lake Michigan watershed contains some of the most urbanized of the county, it does boast the Illinois Beach State Park and Spring Bluff and Fort Sheridan Forest Preserves with high quality water resources.

Lake County communities located wholly or predominantly in the watershed include Beach Park, Lake Bluff, Lake Forest, Highwood, Highland Park, North Chicago, Winthrop Harbor, Waukegan and Zion.

SMC is currently completing watershed plans for the Dead River and Kellogg Creek watersheds that will also satisfy the EPA's criteria for watershed-based plans under section 319 of the Clean Water Act. In 2008, the Waukegan Harbor Citizen's Advisory Group completed a plan for the Waukegan River watershed that satisfies the EPA's section 319 criteria.

Figure 1: Map of Major Sub-watersheds and Receiving waters

2 Program Management

This Chapter describes the organizational structures of the City of North Chicago, the County and IEPA. It further discusses the roles and responsibilities of the various involved parties.

2.1 Implementation of this SMPP

The SMPP includes detailed discussions on the types of tasks that are required to meet the permit conditions under the NPDES II program and how to perform these tasks. **Appendix 5.15** includes related tracking forms. The tracking forms are broken out into three categories (based on the frequency of occurrence). There are three different tracking forms included: Annual, As-Needed and On-Going. These forms should be printed annually and the progress of all tasks tracked. At the end of the yearly reporting period (March 1 – February 28/29) the forms should be filed in a binder to document SMPP related activities to IEPA, or their authorized agent, in the case of an audit. It is anticipated that implementation of this SMPP constitutes compliance with the program. The SMPP must be posted on the City of North Chicago's website : <http://www.northchicago.org>.

2.2 Intra-Department Coordination

The City Council is the policy and budget setting authority for the City of North Chicago. The Departments of Engineering, Streets, Water, and Building work together to implement this SMPP. The Stormwater Coordinator (City Engineer) has primary responsibility for managing the overall program.

2.2.A Stormwater Coordinator

The City Engineer is the Stormwater Coordinator and is responsible for the oversight and implementation of this SMPP. The Stormwater Coordinator has many different responsibilities, he/she:

- is the lead contact for coordination with the Lake County Stormwater Management Commission, the Illinois Environmental Protection Agency, contractors, the development community and other external regulatory agencies;
- understands the requirements of ILR40, ensures that the SMPP meets the requirements of the permit and that the City of North Chicago effectively implements the SMPP;
- ensures, as the Enforcement Officer in ensuring, that the City of North Chicago complies with all minimum Watershed Development Ordinance (WDO) provisions;
- ensures that the Municipal Facilities comply with all minimum ILR40 permit requirements;
- is aware when a Municipal Project is required to be authorized under the ILR10 permit. In these cases the Stormwater Coordinator should ensure that the NOI is received by IEPA at least 30 days prior to the start of construction; and

- assists the development community in understanding when a ILR10 permit is required and whether construction sites comply with the general ILR10 and WDO permit conditions; and
- should understand the role illicit discharges play in the overall NPDES II program. In general, an incidence of non-compliance must be filed with IEPA for illicit discharges exiting an MS4's outfall into a receiving water. Additionally, if the illicit discharge is generated by a construction site, it may be necessary for both the applicant and the MS4 to file the ION form with IEPA.

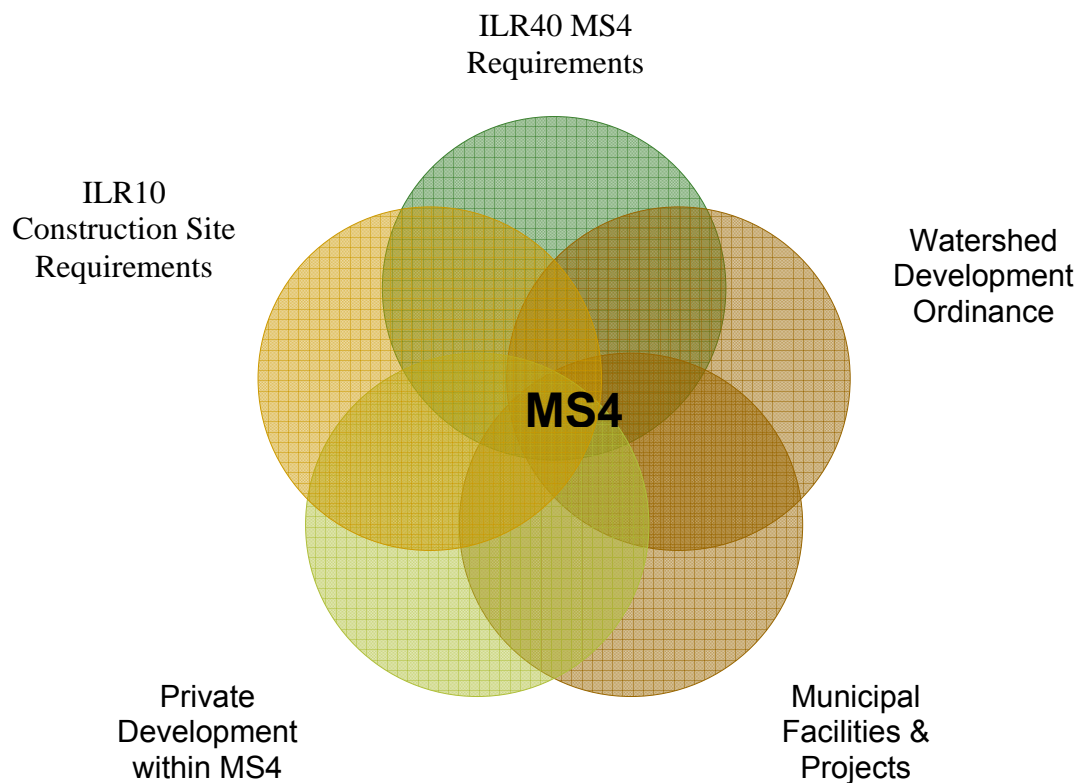


Figure 2: Roles of MS4
provided by Gewalt Hamilton & Associates

2.2.B Engineering Department

Engineering personnel support the Stormwater Coordinator in obtaining compliance with both the NDPS and WDO programs.

For Certified Communities

The City of North Chicago City Engineer is also the Enforcement Officer with respect to the administration and enforcement of the Lake County Watershed Development Ordinance (WDO). The design and construction of all public projects shall comply with the WDO. As the Enforcement Officer, the City Engineer has the responsibility to concur that projects meet WDO standards prior to the issuance of permits, and oversee site inspections during construction. Refer to Chapter 3.4-3.5 for additional information on this process.

2.2.C Street and Water Department

Infrastructure maintenance activities within the MS4 are carried out by Street and Water department personnel. Street and Water department personnel are designated as the primary entity responsible for performing the duties specified under Chapter 3.3 Illicit Discharge Detection and Elimination and Chapter 3.6 Pollution Prevention and Good Housekeeping.

2.3 Coordination with Lake County Stormwater Management Commission

Coordination between the MS4 and the Lake County Stormwater Management Commission (SMC) occurs through both participation in the SMC sponsored MAC forums and through the Certified Community Status under the Lake County Watershed Development Ordinance (WDO). The MS4's Stormwater Coordinator is the lead contact for participation in the MAC forums. If the MS4 is a Certified Community, the MS4's Enforcement Officer is responsible for enforcement of the WDO and is designated by the MS4 to the SMC.

2.4 Coordination with Consultants

The MS4 may enlist the services of consultants to assist in the implementation of the WDO (including, but not limited to, plan review, site inspections and enforcement), and the design of MS4 projects. The City Engineer has the responsibility of administering these contracts.

2.5 Coordination of Contractors

The MS4 may hire contracted services. The City of North Chicago also has a responsibility to educate contractors hired by the municipality in the requirements of this SMPP and applicable requirements of the ILR40 and ILR10 permits. Furthermore, the municipality has a responsibility to ensure that the development community hire contractors which meet the qualifications necessary under the program, refer to Chapter 3.4.B for additional information on qualified personnel.

2.6 Coordination with the Public

Coordination with the Public occurs on several levels. The Public Education and Outreach Program of this SMPP is discussed in Chapter 3.1. The Public Participation and Involvement Program of this SMPP is discussed in Chapter 3.2. The Public has the opportunity to comment on proposed preliminary and final plats through the Plan Commission and City Council process established in the City of North Chicago Subdivision Code.

2.7 Coordination with the IEPA

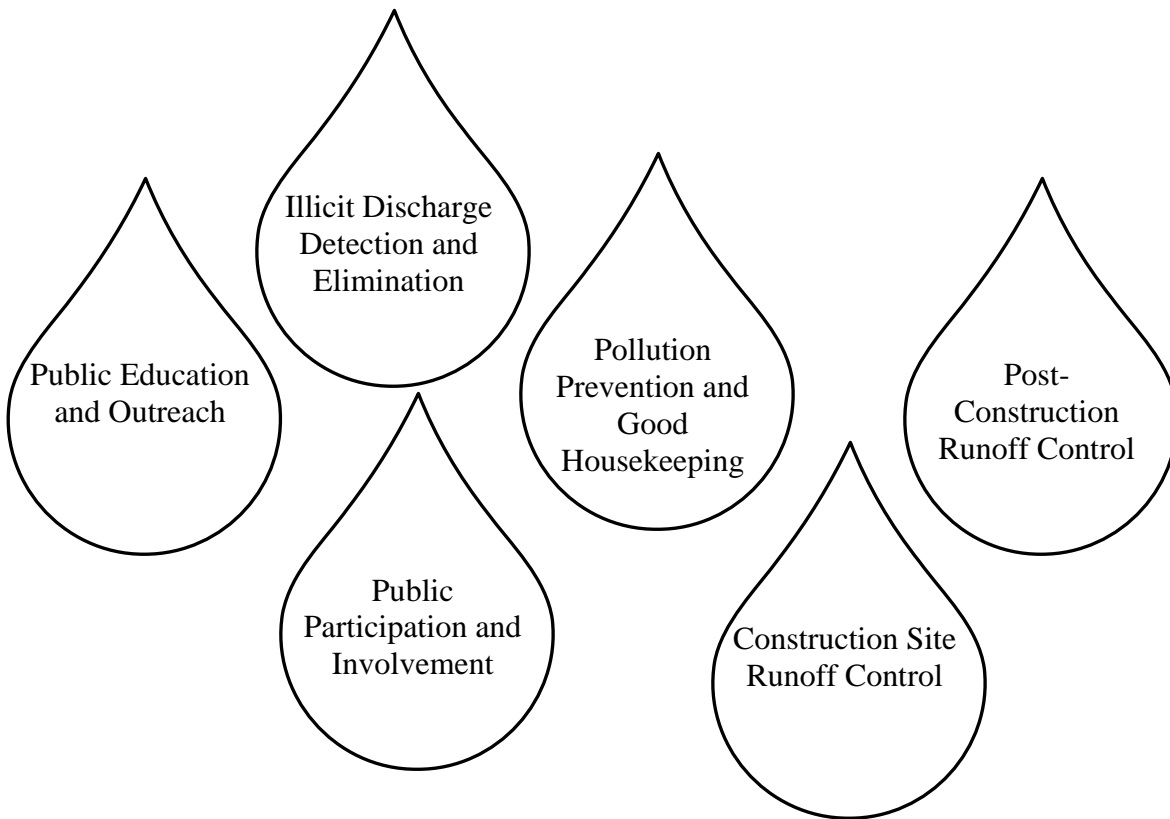
The City of North Chicago is required to complete an annual report which describes the status of compliance with the ILR40 permit conditions and other related information as presented on the annual report template provided by the QLP. The annual report must be posted on the City of North Chicago's website and submitted to the IEPA by the first day of June each year. Annual reporting to IEPA should consist of "implemented SMPP" for all tasks completed in accordance with this SMPP. Additional information should be provided for areas of enhancement or tasks not completed.

Records regarding the completion and progress of the SMPP commitments must be kept by the community. The task sheets, described in Chapter 2.1, should be updated throughout the year. The completed task sheets should be located in a file with necessary supporting documentation. The file must be available for inspection by both IEPA and the general public.

2.8 Coordination with the Development Community

The City of North Chicago has a responsibility to assist the development community in understanding when a ILR10 permit is required and whether construction sites comply with the general ILR10 and WDO permit conditions. The City of North Chicago should understand the role illicit discharges play in the overall NPDES II program. In general, an incidence of non-compliance must be filed with IEPA for illicit discharges exiting an MS4's outfall into a receiving water. Additionally, if the illicit discharge is generated by a construction site, it may be necessary for both the applicant and the MS4 to file the ION form with IEPA.

3 The Program



This Stormwater Management Program Plan includes six components, each of which is necessary in an effort to reduce/eliminate stormwater pollution in receiving water bodies. Chapter 3.1 describes the efforts to educate the public about stormwater pollution and stormwater pollution prevention. The manner in which City of North Chicago incorporates public participation and involvement into the SMPP is explained in Chapter 3.2. Chapter 3.3 describes the approach to detecting and eliminating stormwater illicit discharges. Construction and post construction runoff control is addressed in Chapters 3.4 and 3.5. Lastly, Chapter 3.6 discusses responsibilities for the care and upkeep of its general facilities, associated maintenance yards, and municipal roads and to minimize pollution. This chapter also discusses necessary training for employees on the implementation of the SMPP.

3.1 Public Education and Outreach



The City of North Chicago conducts public education programs that inform the community of potential impacts to receiving waters and the contributions the public can make to reduce pollutants in stormwater runoff. The City of North Chicago targets public schools, public libraries, developers, contractors, homeowners, business owners, and the remaining general public as part of this Public Education and Outreach Program.

The City of North Chicago, in cooperation with the QLP, utilizes a variety of methods to educate and provide outreach to the public about the importance of managing pollutants that potentially could enter the stormwater system. The program includes the following activities which are discussed in greater detail in this chapter.

- Distribute information sheets regarding stormwater BMPs, water quality BMPs, and proper hazardous waste use and disposal.
- Maintain a water quality/stormwater section in the City of North Chicago newsletter distributed by the City of North Chicago.
- Attend/sponsor outreach activities to homeowners / property owner associations, commercial / industrial facilities, schools, and other events.
- Coordinate, publicize, and participate in SWALCO events.
- Maintain City of North Chicago website which offers links to additional educational information, and ways to contact City of North Chicago personnel.

3.1.A Distribution of Paper Materials

The City of North Chicago actively pursues the acquisition of educational sheets prepared by the QLP, IEPA, USEPA, Center for Watershed Protection, Chicago Metropolitan Agency for Planning “CMAP” (previously Northeastern Illinois Planning Commission “NIPC”), University of Wisconsin Extension, Solid Waste of Lake County (SWALCO) and other agencies and organizations. The City of North Chicago maintains a list of available publications in the SMPP file, the web-site, and the City Hall media rack. The City of North Chicago lists the Stormwater Coordinator’s telephone

number on the City of North Chicago website and newsletter to encourage residences to contact the City of North Chicago with environmental concerns.

Types of materials distributed include but are not limited to:

- The “Guidelines for Draining Swimming Pools” door hanger,
- “After the Storm” Citizen’s Guide to understanding stormwater,
- Informational sheets/pamphlets regarding storm water and water quality best management practices,
- Informational sheets/pamphlets regarding construction site activities (soil erosion and sediment control best management practices),
- Informational sheets/pamphlets published by SWALCO regarding proper hazardous waste use and disposal, and
- A water quality/storm water section in the municipal newsletter.

Publications are provided in the following manner:

- At take-a-away racks,
- At annual outreach events,
- The municipal newsletter, as often as is published,
- At appropriate pre-construction meetings,
- Attached to building permits requiring an NPDES permit, and
- At scheduled meetings with the general public. These meetings are on an as needed or as requested basis and may be with the home owners associations, businesses, or local schools.

3.1.B Web Site



The City of North Chicago's web site includes stormwater quality specific elements. The web-site gives information regarding water quality, solid waste and hazardous material, stormwater and general environmental health. The web-site is updated by City of North Chicago staff and reviews user-sessions. A significant amount of information is made available through links to other educational and informational sites.

This SMPP, the NOI and any previous annual reports must be posted on the City of North Chicago's website. Each year's annual report must be posted on the City of North Chicago's website and submitted to the IEPA by the first day of June each year.

3.1.C Technical Workshops



Periodically, the QLP hosts or co-host workshops for the general public that focus on specific stormwater topics. These workshops typically discuss stormwater topics currently of interest within the County. They offer the opportunity to share information and facilitate a collective focus on potential solutions to the challenges faced by the County, Villages, and other stakeholders. The City of North Chicago publicizes these events on the web-site when notified by the QLP.

3.1.D Storm Drain Stenciling & Markers



The City of North Chicago supports the efforts of private entities to stencil or apply stickers to inlets, and their purchase of factory stamped inlet grates. These efforts apply messages at storm drain inlets with the intent of assisting in educating the public about stormwater runoff pollution. The City of North Chicago's efforts include:

- Providing the "Guide to Storm Drain Marking" (by SMC) to Home Owners Associations, school groups etc. that express interest.
- Requiring all new development to furnish stamped inlet grates as of March 2009.
- The City of North Chicago encourages all Home Owners Associations to annually paint the embossed area, of any stamped inlet grates within the subdivision.
- Instituting a program to improve existing inlets through the use of stickers or other markers by municipal staff or private groups.

3.1.E Household Hazardous Wastes



The average garage contains numerous products that are classified as hazardous wastes, including paints, stains, solvents, used motor oil, pesticides and cleaning products. While some household hazardous waste (HHW) may be dumped into storm drains, most enters the storm drain system as a result of outdoor rinsing and cleanup. Improper disposal of HHW can result in acute toxicity to downstream aquatic life. The desired neighborhood behavior is to participate in HHW collection days, and to use appropriate pollution prevention techniques when conducting rinsing, cleaning and

fueling operations. The City of North Chicago provides support to the initiatives of the Solid Waste Agency of Lake County to employ a range of tools to improve resident participation. These include:

- Mass media campaigns to educate residents about proper outdoor cleaning/ rinsing techniques
- Conventional outreach materials notifying residents about HHW and collection days
- Providing curbside disposal options for some HHW

3.1.E.1 Solid Waste Agency of Lake County (SWALCO)

SWALCO provides solid waste management programs to Lake County (in both incorporated and unincorporated areas). Their programs are aimed at reducing our reliance on landfills through source reduction, recycling and energy recovery. In general, the programs help residents dispose of problem wastes, such as household chemicals, electronic equipment, and yardwaste. Their recycling programs are targeted at both commercial and residential markets in order to divert as much solid waste as possible from reaching landfills. They also administer their own public information and education efforts include the “Earth Flag” and “Earth Flag Every Day” programs in the schools, promoting SWALCO events, and publishing various resources.

The City of North Chicago coordinates with SWALCO to participate in various collections each year. These collections encourage the proper disposal of hazardous materials. The events can be held at the City Street Department (City Yard). At a minimum, the City of North Chicago encourages participation in the event by publicizing these special collections in local newspapers and on the City of North Chicago’s web-site. The City of North Chicago maintains a log of event dates and quantities collected.

3.1.F Vehicle Fluid Maintenance



Dumping of automotive fluids into storm drains can cause major water quality problems, since only a few quarts of oil or a few gallons of antifreeze can severely degrade a small stream. Dumping delivers hydrocarbons, oil and grease, metals, xylene and other pollutants to streams, which can be toxic during dry-weather conditions when existing flow cannot dilute these discharges. The major culprit has been the backyard mechanic who changes his or her own automotive fluids. The City of North Chicago employs a range of tools to improve septic system maintenance. These include:

- Advertisement of used oil collection stations
- Pollution hotlines
- Fines and other enforcement actions

3.1.G Car Washing

Car washing is a common neighborhood behavior that can produce transitory discharges of sediment, nutrients and other pollutants to the curb, and ultimately the storm drain. Communities have utilized many innovative outreach tools to promote environmentally safe car washing, including:

- Media campaigns
- Brochures promoting nozzles with shut off valves
- Storm drain plug and wet vac provisions for charity car wash events
- Water bill inserts promoting environmentally safe car washing products
- Discounted tickets for use at commercial car washes

3.1.H Pool Dewatering



Chlorinated water discharged to surface waters, roadways or storm sewers has an adverse impact on local stormwater quality. High concentrations of chlorine are toxic to wildlife, fish and aquatic plants. The pH of the water should be between 6.5 and 8.5. Algaecides such as copper or silver can interrupt the normal algal and plant growth in receiving waters and should not be present when draining. Prepare appropriately before draining down a pool. It is recommended that one of the following measures be used:

- 1) De-chlorinate the water in the pool prior to draining through mechanical or chemical means; these types of products are available at local stores.
- 2) De-chlorinate the water in the pool through natural means. Pool water must sit at least 2 days with a reasonable amount of sun, after the addition of chlorine or bromine. It is recommended that the chlorine level be tested after 2 days to ensure that concentrations are at a safe level (below 0.1-mg/l).
- 3) Drain the pool slowly over a several day period across the lawn; or drain directly into the sanitary sewer using the following additional guidelines:
 - a) Avoid discharging suspended particles (e.g. foreign objects blown into the pool like leaves, seedlings, twigs etc) with pool water.
 - b) When draining your pool, do not discharge directly onto other private properties or into public right-of-way **including storm sewer inlets**.

The City of North Chicago has acquired a door hanger and fact sheet, ***Pool Dewatering Fact Sheet*** (**Appendix 5.11**), stating the above information. Outreach efforts (such as including information in the news letter, other mail-outs or adding information to the take-a-way racks) occur as warranted.

3.2 Public Participation and Involvement

The public participation and involvement program allows input from citizens during the development and implementation of the SMPP. The SMPP should be evaluated annually. Major highlights and deficiencies should be noted annually and the plan revised accordingly on a minimum 5-yr basis, or as necessary.

3.2.A Public Review Process

Prior to the acceptance of the SMPP, the draft document was presented to the City of North Chicago Water Committee. Comments on the SMPP are continually accepted through the web-site, phone calls or other media. Comments are evaluated for inclusion and incorporated into the next revision of the SMPP as appropriate.

3.2.B Complaints, Suggestions and Requests



Calls are screened, logged and routed to the appropriate department for action. General program related calls are directed to the Stormwater Coordinator, or designee. Construction activity related telephone calls are directed to the Enforcement Officer, or designee. Illicit Discharge, storm sewer, and other related stormwater runoff concerns are directed to the Stormwater Coordinator. The City of North Chicago maintains a website which enables and encourages public contact on these issues.

3.2.C Watershed Planning and Stakeholders Meetings

The City of North Chicago participates (and encourages the participation of local stakeholders) in QLP or other sponsored watershed planning events. The City of North Chicago will adopt Watershed Plans per the direction and in coordination with the QLP.

3.2.D Illicit Discharge/Illegal Dumping Hotline



The City of North Chicago maintains, operates and publicizes a call in phone number where parties can contact the City of North Chicago with environmental concerns. Primary advertisement venues include the website and all related municipal publications. Telephone calls received from residents, other internal Departments or other agencies are logged on the **Indirect Illicit Discharge Tracking Form (Appendix 5.13)**. The Stormwater Coordinator, or designee, should transfer information from the tracking form to the **Indirect Illicit Discharge Summary Form (Appendix 5.13)** monthly. This tracking form should be reviewed with the Stormwater Coordinator annually to determine if trends can be seen and if there are additional outreach efforts needed.

3.2.E LCSMC Municipal Advisory Committee (MAC)

The City of North Chicago participates in MAC meetings and events hosted by the QLP.

3.2.F Adopt-A-Highway



The City of North Chicago in cooperative partnership with the IDOT, conducts and locally administers Adopt-A-Highway Programs for state roadways within the municipal limits. The objective of the program is to improve and promote the image of the entire community by reducing potential illicit discharges. Participation meets the Program Policy and Safety Guidelines established by IDOT in a separate document.

3.3 Illicit Discharge Detection and Elimination¹



Currently, illicit discharges (defined in 40 CFR 122.26(B)(2)) contribute considerable pollutant loads to receiving waters. There are two primary situations that constitute illicit discharges; these include non-stormwater runoff from contaminated sites and the deliberate discharge or dumping of non-stormwater. Illicit discharges can enter the storm sewer system as either an indirect or direct connection.

3.3.A Regulatory Authority

Effective implementation of an IDDE program requires adequate legal authority to remove illicit discharges and prohibit future illicit discharges. This regulatory authority is achieved through adoption of the Lake County Watershed Development Ordinance (WDO) and the City of North Chicago's IDDE Ordinance. Additionally, IEPA has regulatory authority to control pollutant discharges and can take the necessary steps to correct or remove an inappropriate discharge over and above MS4 jurisdiction.

3.3.A.1 Watershed Development Ordinance

Several provisions of the Lake County Watershed Development Ordinance (WDO) prohibit illicit discharges as part of the development process. These provisions are only applicable for regulated development activities as defined by the WDO. Regulated developments are required to meet the soil erosion and sediment control standards of the WDO. Furthermore, the WDO requires that the applicant prohibit illicit discharges into the stormwater management system generated during the development process.

The WDO allows the City of North Chicago to require inspection deposits, performance bonds, and to adopt/enforce violation procedures. These tools assist in achieving complaint construction sites. These items are further discussed in Chapters 3.4 and 3.5.

¹ Section 3.3 is a revision of the Lake Michigan Watershed Stormwater Outfall Screening Program Training Program (April 1994 by SMC), and incorporates material from the Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments (October 2004 by the Center for Watershed Protection and Robert Pitt, University of Alabama).

3.3.A.2 *Illicit Discharge Ordinance*

The City of North Chicago created and adopted an Illicit Discharge Ordinance, Chapter 11-4B of the North Chicago City Code. The Ordinance is the mechanism to allow for the execution and enforcement of the SMPP.

3.3.A.3 *Subdivision Ordinance*

The City of North Chicago created and adopted a Subdivision Ordinances. This Ordinances is administered by the Community Development and Engineering Departments and can be used to further support the activities required by the SMPP.

3.3.B **Understanding Outfalls and Illicit Discharges**

Understanding the potential locations and the nature of illicit discharges in urban watersheds is essential to find, fix and prevent them.

3.3.B.1 *Identifying Outfalls and Receiving Waters*

An Outfall (is defined at 40 CFR 122.26(B)(9)) means a point source (as defined by 40 CFR 122.2) at the point where a municipal separate storm sewer discharges into a waters of the United States “receiving water”. Open conveyances connecting two municipal storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other Waters of the United States are not considered Outfalls. For the purposes of this manual the following definitions shall be used:

Outfall: Storm sewer outlet, or other open conveyance point discharge location, that discharges into a Waters of the U.S, receiving water or another MS4.

Regulated systems include the conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, gutters, ditches, swales, manmade channels or storm sewers.

The outfall inventory was completed by the City of North Chicago engineering department. This investigation was completed using the existing utility atlases and visual inspection to create an ***Outfall Inventory Map***. This map is used in combination with the previously existing ***Storm Sewer Atlas*** to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular water bodies these flows may be affecting. The inlets and outfall locations have been numbered to facilitate detection and tracking of identified illicit discharges. The ***Storm Sewer Atlas and Outfall Inventory Map*** can be obtained from the City Engineer.

The outfall map should be revised annually to incorporate permitted outfalls associated with new developments. An outfall inventory should be performed every 5 years; the focus of this effort is to search for new outfalls (i.e. those not already included on the existing ***Outfall Inventory Map***). The search for new outfalls should be combined with the pre-screening efforts (Chapter 3.3.D.1).

3.3.B.2 Potential Sources of Illicit Discharges

Table 1 shows that direct connections to storm sewer systems most likely originate from commercial/industrial facilities. Thus, the focus on Chapter 3.3 is on the identification of illicit discharges from commercial/industrial facilities.

Table 1: Potential Sources of Illicit Discharges to Storm Sewers

Potential Sources	Storm Sewer Entry		Flow Characteristics	
	Direct	Indirect	Continuous	Intermittent
Residential Sources				
Sanitary Wastewater	√	X	√	X
Septic Tank Effluent	-	√	√	X
Household Chemicals	X	√	-	√
Laundry Wastewater	√	-	-	√
Excess Landscaping Watering	-	√	-	√
Leaking Potable Water Pipes	-	√	√	-
Commercial Sources				
Gasoline Filling Stations	√	X	-	√
Vehicle Maint./Repair Facilities	√	X	-	√
Laundry Wastewater	√	-	√	X
Construction Site Dewatering	-	√	√	X
Sanitary Wastewater	√	X	√	-
Industrial Sources				
Leaking Tanks and Pipes	X	√	√	X
Misc. Process Waters	√	X	√	X

√: Most likely condition.

X: May Occur

-: Not very likely

Source: Adapted From: USEPA. January 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems: A User's Guide*. Cincinnati, Ohio.

3.3.B.3 USEPA Exclusions

It is noted that not all dry-weather flows are considered inappropriate discharges. Under certain conditions, the following discharges are not considered inappropriate by USEPA:

- Water line flushing,
- Landscaping irrigation,
- Diverted stream flows,
- Rising groundwaters,
- Uncontaminated groundwater infiltration,
- Uncontaminated pumped groundwater,
- Discharges from potable water sources,
- Flows from foundation drains,
- Air conditioning condensation,
- Irrigation water,
- Springs,
- Water from crawl spaces,

- Lawn watering,
- Individual car washing,
- Flows from riparian habitats and wetlands,
- Dechlorinated swimming pool water, and
- Street wash water.

3.3.B.4 Pollutant Indicators

3.3.B.4.a PHYSICAL INDICATORS

Adapted from New Hampshire Estuaries Project and the IDDE Guidance Manual by the Center for Watershed Protection.

Odor

Water is a neutral medium and does not produce odor; however, most organic and some inorganic chemicals contribute odor to water. Odor in water may originate from municipal and industrial waste discharges, from natural sources such as decomposition of vegetative matter, or from associated microbial activity.

Table 2: Odor or Potential Illicit Discharges (adapted from CWP)

Odor	Possible Cause
Sewage	Wastewater treatment facilities, domestic waste connected into storm drain, failing septic system
Sulfide (rotten eggs)	Decaying organic waste from industries such as meat packers, dairies and canneries
Rancid/sour	Many chemicals, including pesticides and fertilizers, emit powerful odors that may produce irritation or stinging sensations.
Petroleum/gas	Industry associated with vehicle maintenance or petroleum product storage; gas stations
Laundry	Laundromat, dry cleaning, household laundry

Color

Color is a numeric computation of the color observed in a water quality sample, as measured in cobalt-platinum units. Both industrial liquid wastes and sewage tend to have elevated color values. Unfortunately, some “clean” flow types can also have high color values. A color value higher than 500 units may indicate an industrial discharge.

Table 3: Color of Potential Illicit Discharges (adapted from CWP)








Water Color	Possible Cause	Images
Brown Water – water ranging in color from light-tea to chocolate milk; it may have a rotten egg odor.	Human causes may be eroded, disturbed soils from constr. sites, animal enclosures, destabilized stream banks and lake shore erosion due to boat traffic.	
Yellow –	Human causes may include textile facilities, chemical plants or pollen.	
Gray Water – water appears milky and may have a rotten egg smell and/or soap odor. There may also be an appearance of cottony slime.	Human causes may be illicit connections of domestic wastewater; untreated septic system discharge; illegal boat discharge; and parking lot runoff.	
Green Water – ranging from blue green to bright green color and may impart odor. Conditions typically occur from May to October.	Human causes may be over-fertilizing lawns, boat discharges, septic systems, agriculture operations, or discharging poorly treated wastewater.	
Orange/Red -	Human causes may include meat packing facilities or dyes.	
Green Flecks – resembling floating blue-green paint chips or grass clippings. These <i>Blooms</i> and are potentially toxic.	Human cause is excessive nutrients. Fertilizers used on lawns can contaminate surface and ground water.	

Table 3 (continued)

Water Color	Possible Cause	Images
Green Hair-Like Strands - bright or dark green, resembling cotton candy and often in floating mats.	Human causes are excessive nutrients from fertilizers or failed on-shore septic systems.	
Multi-Color Water – various or uniform color, other than brown, green or gray. For rainbow sheen see floatables.	Human causes include oil or hazardous waste spill, paint and paint equipment rinsed into storm drains or into failing septic systems.	

Turbidity

Turbidity is a measure of the clarity of water. Turbidity may be caused by many factors, including suspended matter such as clay, silt, or finely divided organic and inorganic matter. Turbidity is a measure of the optical properties that cause light to be scattered and not transmitted through a sample. The presence of turbidity is to be assessed by comparing the sample to clean glass sample container with colorless distilled water.

Turbidity and color are related terms but are not the same. Remember, turbidity is a measure of how easily light can penetrate through the sample bottle, whereas color is defined by the tint or intensity of the color observed.

Figure 4
Turbidity Severity Examples
(adapted from CWP)



Turbidity
Severity 1



Turbidity
Severity 2



Turbidity
Severity 3

Floatables

The presence of sewage, floating scum, foam, oil sheen, or other materials can be obvious indicators of an illicit discharge. However, trash originating from areas adjacent to the outfall is this section.

- If you think the floatable is sewage, you should automatically assign it a severity score of three since no other source looks quite like it.
- Suds are rated based on their foaminess and staying power. A severity score of three is designated for thick foam that travels many feet before breaking up. Natural foam breaks apart easily, can be brown, black or yellowish and may smell fishy or musty.
- Surface oil sheens are ranked based on their thickness and coverage. In some cases, surface sheens may not be from oil discharges, but instead created by in-stream processes. A petroleum sheens doesn't break apart and quickly flows back together.

Figure 5
Natural Sheen versus Synthetic
(adapted from CWP)







Sheen from natural bacteria forms a swirl-like film that cracks if disturbed



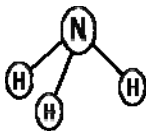
Synthetic oil forms a swirling pattern

Table 4: Floatables in Potential Illicit Discharges (adapted from CWP)

Floatables	
<p>Sewage</p> 	<p>Human causes include connection of domestic wastewater, leaking sanitary sewers or failing septic systems.</p>
<p>Suds and Foam –</p> 	<p>Common human causes of unnatural foam include leaking sewer lines, boat discharges, improper sewer connections to storm sewers and detergents from car washing activities.</p>
<p>Petroleum (oil sheen)</p> 	<p>Human causes may include leaking underground storage tank or illegal dumping.</p>
<p>Grease</p> 	<p>Common human causes include overflow from sanitary systems (due to clogging from grease) and illegal dumping.</p>

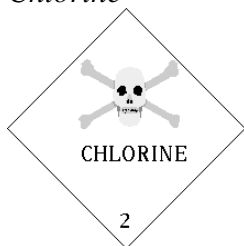
3.3.B.4.b TESTING INDICATORS

Ammonia



Ammonia is a good indicator of sewage, since its concentration is much higher there than in groundwater or tap water. High ammonia concentrations (>50 mg/l) may also indicate liquid wastes from some industrial sites. Ammonia is relatively simple and safe to analyze. Some challenges include the potential generation of wastes from non-human sources, such as pets or wildlife.

Chlorine



Chlorine is used throughout the country to disinfect tap water, except where private wells provide the water supply. Chlorine concentrations in tap water tend to be significantly higher than most other discharge types. Unfortunately, chlorine is extremely volatile, and even moderate levels of organic materials can cause chlorine levels to drop below detection levels. Because chlorine is non-conservative, it is not a reliable indicator, although if very high chlorine levels are measured, it is a strong indication of a water line break, swimming pool discharge, or industrial discharge from a chlorine bleaching process.

Copper



Concentrations of copper in dry-weather flows can be a result of corrosion of water pipes or automotive sources (for example, radiators, brake lines, and electrical equipment). The occurrence of copper in dry-weather flows could also be caused by inappropriate discharges from facilities that either use or manufacture copper-based products. A copper value of >0.025-mg/L indicates an industrial discharge is present.

Industrial sources of copper include the following:

- Copper manufacturing (smelting),
- Copper metal processing/scrap remelting,
- Metal plating,
- Chemicals manufacturing,
- Analytical laboratories,
- Power plants,
- Electronics,
- Wood preserving, and
- Copper wire production.

In each of these industries, wastes containing copper would normally be discharged to a treatment facility. Sludge from the waste treatment facility, whether on-site (including lagooning) or publicly operated treatment facilities, would contain copper. If the sludge (or the treatment process) is not managed properly, copper could enter the storm sewer system.

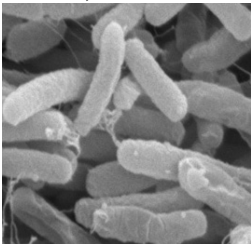
Detergents



Most illicit discharges have elevated concentration of detergents. Sewage and washwater discharges contain detergents used to clean clothes or dishes, whereas liquid wastes contain detergents from industrial or commercial cleansers. The nearly universal presence of detergents in illicit discharges, combined with their absence in natural waters or tap water, makes them an excellent indicator.

Research has revealed three indicator parameters that measure the level of detergent or its components-- surfactants, fluorescence, and surface tension. Surfactants have been the most widely applied and transferable of the three indicators. Fluorescence and surface tension show promise, but only limited field testing has been performed on these more experimental parameters; therefore these are not tested. Refer to Boron and Surfactants descriptions.

E. coli, Enterococci and Total Coliform



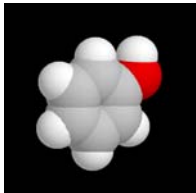
Each of these bacteria is found at very high concentrations in sewage compared to other flow types, and is a good indicator of sewage or seepage discharges, unless pet or wildlife sources exist in the subwatershed. Overall, bacteria are good supplemental indicators and can be used to find “problem” streams or outfalls that exceed public health standards. A Fecal Coliform count greater than 400 per 100 mL indicates waste water contamination.

Fluoride



Fluoride, at a concentration of two parts per million, is added to drinking water supplies in most communities to improve dental health. Consequently, fluoride is an excellent conservative indicator of tap water discharges or leaks from water supply pipes that end up in the storm drain. Fluoride is obviously not a good indicator in communities that do not fluorinate drinking water, or where individual wells provide drinking water. Fluoride levels greater than 0.6-mg/L indicate a potable water source is connected to the stormwater system.

Phenol



Phenol is a very commonly occurring chemical and can be found in foods, medicines, and cleaning products, as well as industrial products and by-products. Generally, the appearance of phenols in stormwater would indicate a misconnected industrial sewer to a storm drain or ditch. Exceptions would include runoff from treated wood storage yards (for example, treated lumber and telephone poles) and improper disposal (flash dumping) of cleaning products. A phenol value greater than 0.1-mg/L indicate an illicit discharge is present.

Industrial sources of phenol include the following:

- Chemical manufacturing (organic),
- Textile manufacturing,
- Paint and coatings manufacturing,
- Metal coating,
- Resin manufacturing,
- Tire manufacturing,
- Plastics fabricating,
- Electronics,
- Oil refining and re-refining,
- Naval stores (turpentine and other wood treatment chemicals),
- Pharmaceutical manufacturing,

- Paint stripping (for example, automotive and aircraft),
- Military installations (rework and repair facilities),
- Coke manufacturing,
- Iron production, and
- Ferro-alloy manufacturing.

Other sources of phenol include improper handling and disposal of cleaning compounds by institutions such as hospitals and nursing homes.

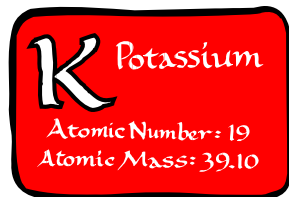
pH



Potential ID Range: >6.5 and < 8.5

Most discharge flow types are neutral, having a pH value around 7, although groundwater concentrations can be somewhat variable. pH is a reasonably good indicator for liquid wastes from industries, which can have very high or low pH (ranging from 3 to 12). The pH of residential wash water tends to be rather basic (pH of 8 or 9). The pH of a discharge is very simple to monitor in the field with low cost test strips or probes. Although pH data is often not conclusive by itself, it can identify problem outfalls that merit follow-up investigations using more effective indicators.

Potassium



Potassium is found at relatively high concentrations in sewage, and extremely high concentrations in many industrial process waters. Consequently, potassium can act as a good first screen for industrial wastes, and can also be used in combination with ammonia to distinguish wash waters from sanitary wastes. An ammonia to potassium ratio of >1 or <1 indicate waste water or wash water discharge respectively. A potassium value of $>20\text{-mg/l}$ is a good indicator for industrial discharges.

Surfactants



Surfactants are the active ingredients in most commercial detergents, and are typically measured as Methyl Blue Active Substances (or MBAS). They are a synthetic replacement for soap, which builds up deposits on clothing over time. Since surfactants are not found in nature, but are always present in detergents, they are excellent indicators of sewage and wash waters. The presence of surfactants in cleansers, emulsifiers and lubricants also makes them an excellent indicator of industrial or commercial liquid wastes. A surfactant value of $> 0.25\text{-mg/L}$ within residential areas indicates that either a sewage or washwater is present in the stormwater; a value of $>5\text{-mg/L}$ within non-residential areas indicates that there is an industrial discharge (refer to Table 46 from the Illicit Discharge Detection and Elimination manual by the Center for Watershed Protection for use in determining industrial flow types).

3.3.C Indirect Connection Program



Indirect connections are subtle connections, such as dumping or spillage of materials into storm sewer drains. Flash dumping is a common type of indirect connection. Generally, indirect modes of entry produce intermittent or transitory discharges, with the exception of groundwater seepage. There are five main modes of indirect entry for discharges.

3.3.C.1 Groundwater Seepage

Seepage discharges can be either continuous or intermittent, depending on the depth of the water table and the season. Groundwater seepage usually consists of relatively clean water that is not an illicit discharge by itself, but can mask other illicit discharges. If storm drains are located close to sanitary sewers, groundwater seepage may intermingle with diluted sewage. Addressing seepage that is observed during the outfall screening process is described in more detail in this Chapter.

3.3.C.2 Spills

These transitory discharges occur when a spill travels across an impervious surface and enters a storm drain inlet. Spills can occur at many industrial, commercial and transport-related sites. A very common example is an oil or gas spill from an accident that then travels across the road and into the storm drain system. The Spill Response Plan is described in Chapter 3.6.B.

3.3.C.3 Dumping

Dumping a liquid into a storm drain inlet: This type of transitory discharge is created when liquid wastes such as oil, grease, paint, solvents, and various automotive fluids are dumped into the storm drain. Liquid dumping occurs intermittently at sites that improperly dispose of rinse water and wash water during maintenance and cleanup operations. A common example is cleaning deep fryers in the parking lot of fast food operations. The Storm Drain Stenciling, Household Hazardous Wastes, Vehicle Fluid Maintenance and Pool Dewatering programs are designed to minimize dumping; these programs are described in Chapter 3.1.F, G, I and K. Additionally, the City maintains a Illegal Dumping Hotline which is described in Chapter 3.2.D. The procedure for handling a dumping incident is described in Chapter 3.6.B.1.

3.3.C.4 Outdoor washing activities

Outdoor washing may or may not be an illicit discharge, depending on the nature of the generating site that produces the wash water. For example, hosing off individual sidewalks and driveways may not generate significant flows or pollutant loads. On the other hand, routine washing of fueling areas, outdoor storage areas, and parking lots (power washing), and construction equipment cleanouts may result in unacceptable pollutant loads. Individual washing activities are addressed through the Public Education and Outreach Program in Chapter 3.1.J whereas observed/documented routine washing activities should be addressed through the Removal of Illicit Discharges Procedure in Chapter 3.3.E.4.

3.3.C.5 Non-target irrigation from landscaping or lawns

Irrigation can produce intermittent discharges from over-watering or misdirected sprinklers that send tap water over impervious areas. In some instances, non-target irrigation can produce unacceptable loads of nutrients, organic matter or pesticides. The most common example is a discharge from commercial landscaping areas adjacent to parking lots connected to the storm drain system. This type of discharge is addressed by the Public Education and Outreach Program in Chapter 3.1.

3.3.D Direct Connection Illicit Discharge Program



Direct connections enter through direct piping connections to the storm sewer system, and since direct connections exist regardless of whether or not a stormwater event (e.g. rain or melting snow) is occurring, they are most easily detected during dry-weather periods. Inspection of stormwater outfalls during dry-weather conditions reveals whether non-stormwater flows exist. If non-stormwater flows are observed, they can be screened and tested to determine whether pollutants are present. If the presence of pollutants is indicated, the detective work of identifying the source of the discharge can begin. Once the source is identified, it can then be corrected. A direct connection illicit discharge program consists of three principal components: 1) program planning, 2) outfall screening, and 3) follow-up investigation and program evaluation.

1. **Program Planning** involves the office work, planning, and organization required to conduct the subsequent outfall screening and follow-up investigative activities of the program. Program planning identifies the regulatory authority to remove directly connected illicit discharges and the identification of the outfalls and receiving waters in the municipality (both discussed earlier in this chapter). Program planning for the direct connection portion of the overall program also includes the identification of the staffing and equipment needed to conduct the outfall screening, and scheduling of the outfall screening activities (Chapter 3.3.A).
2. **Outfall Screening** consists of pre-screening to determine whether dry-weather flows are present and outfall inspection which includes field-testing and grab samples to determine whether pollutants are present in any observed dry-weather flows (Chapter 3.3.B).
3. **Follow-Up Investigation and Program Evaluation** are the steps necessary to determine the source of any identified pollutant flows and eliminate them. The major follow-up investigation and program evaluation components (Chapter 3.3.C.) include:

- reviewing and assessing outfall inspection results,
- internal coordination,
- conducting detailed storm sewer investigations to identify pollutant sources (*tracing*),
- exercising the appropriate legal means to achieve enforcement of the program objective (*removal of pollutants at the source*), and evaluating the program to determine whether subsequent screening activities are necessary.

3.3.D.1 Program Planning

The program planning component is primarily office work related to assembling the necessary information and equipment for efficiently conducting outfall-screening activities. This component of the program addresses the following issues (see **Figure 3**).

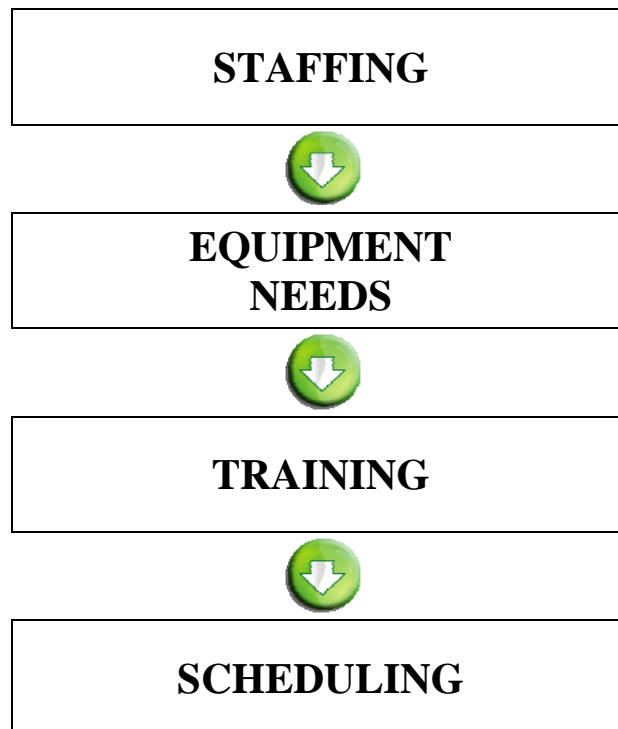


Figure 3: Program Elements

3.3.D.1.a STAFFING



Personnel for an outfall inspection screening program are required for program administration, effort for conducting the outfall screening, and any follow-up investigations. Typically, a two-member City crew is required for the outfall screening and follow-up portions of the program. Based on the number of identified outfalls and program goals, it is anticipated that a two-member crew will be required to perform inspections at least several weeks throughout the year for the first 5-year period.

3.3.D.1.b EQUIPMENT NEEDS



General field equipment and specialized outfall screening equipment are required for IDDE programs. The method of collecting and managing inspection screening data is driven by available technology. A complete list of recommend equipment and supplies is found on ***Stormwater Outfall Screening Equipment Checklist (Appendix 5.2)***. Field Crews carry basic safety items, such as cell phones, surgical gloves, and first aid kits.

3.3.D.1.c TRAINING

Applicable Public Works personnel shall thoroughly read and understand the objectives of the IDDE subchapters of this manual. Applicable field personnel shall have completed a standard training session. It is recommended that applicable Public Works personnel accompany a Public Works supervisor on at least two outfall inspections to learn the use of the ***Stormwater Outfall Inspection Data Form (Appendix 5.3)*** and the use of sampling equipment and test kits. As a training exercise, new Public Works personnel should independently conduct outfall screening activities until two outfall screening data forms are accurate and consistent with the Public Works supervisor investigator's forms.

3.3.D.1.d SCHEDULING

Scheduling for pre-screening or outfall inspections is dependent on staff availability and weather. Pre-screening generally takes place during the late summer or fall months, ideally in August, September, or October, although other summer or fall months may be acceptable, depending on weather conditions. This time period is generally warm, which improves field efficiency as well as reliability and consistency of field-testing. This time period is also more likely to have extended dry periods with little or no precipitation, which is required for the inspection activities.

In order to ensure that samples collected are representative of dry-weather flows, conduct pre-screening and follow-up inspections preceding a dry-weather period, a period of 72 hours of dry weather. A period of 72 hours is selected to allow local detention facilities to drain and local groundwater flows to recede after precipitation events. However, some judgment may be exercised in evaluating the 72 hour period to sampling. For example, if very light rain or drizzle occurred and no runoff was experienced, it is likely that dry-weather conditions would exist and outfall inspection could be conducted.

3.3.D.2 *Outfall Inspection Procedure*



The identification of potential illicit discharge locations is primarily a two part process, pre-screening and follow-up inspections. Pre-screening is performed by a rapid inspection of all outfalls in a pre-determined area such as along a receiving water. Follow-up inspections are required for those pipes found to have dry weather flow. Once probable illicit discharges are found, identify the sources of illicit discharges and correct per the removal procedure of Chapter 3.3.C.4. Outfall inspection consists of the following tasks:

- Pre-Screening
- Outfall Inspection Setup,
- Outfall Inspection,
- Outfall Assessment and Documentation, and
- Daily closeout.

3.3.D.2.a PRE-SCREENING

Pre-screening consists of a rapid inspection of outfalls, during dry weather flow conditions. During pre-screening outfalls are rapidly inspected, preceding a dry-weather period a period of at least 72 hours. Document outfalls observed to have dry weather flow and the quantity of flow (such as trickle, moderate or substantial). Also document outfalls that are partially or fully submerged should for follow-up inspection. Pre-screening results can be seen by viewing the Outfall Inventory Database; outfalls with dry weather flows shall be scheduled for an outfall inspection. It is recommended that each outfall be re-screened every 5 years.

3.3.D.2.b OUTFALL INSPECTION SETUP AND PRECAUTIONS

In this step, an attempt is made to visualize the outfall locations and anticipate any potential problems that could affect the days screening activities. Of particular concern in daily setup is whether any safety issues will be associated with the day's screening activities. For example, does traffic need to be controlled or is access to the outfall difficult. Before leaving an outfall inspection location, field crews must ensure that all necessary equipment is available, operable, and calibrated (as appropriate).

Safety is the primary consideration while inspecting upstream sampling locations. In general, the rule "*if in doubt, don't*" is followed. Latex gloves are worn while collecting and handling samples. A first aid kit is included in each vehicle to treat minor injuries. Obtain medical help for major injuries as soon as possible. Report all injuries, minor and major to appropriate persons.

Access to Private Property



In some cases, it may be necessary for City personnel to enter or cross private property to investigate discovered illicit discharges. A form letter should be prepared that includes a short description of the project, the purpose of the access to the property, and the name of a project contact person with a telephone number. Attempt to contact each home, or business, owner for permission. City personnel shall have identification (business cards are sufficient) indicating that they are municipal employees. If the owner is not present, a letter should be left at the premises to facilitate return inspection. If permission to access property is denied, a public official should then contact the owner at a later date.

Avoid confrontational situations with citizens and attempt to answer questions concisely and without being alarmist. City personnel should be coached on appropriate responses to questions from citizens. If a field crew feels uncomfortable or threatened, they should remove themselves from the situation and report to the incident to their supervisor.

Traffic



All traffic control measures are to be in accordance with the requirements of the *Manual on Uniform Traffic Control Devices* and other internal Policies and Procedures as set forth by the City of North Chicago.

In general, the following additional policies are applicable. Street and Water Department personnel generally work on streets only during the hours of 7:30 a.m. to 4:00 p.m. except in emergency situations. All field crews are required to wear Personal Protection Equipment (PPE) in accordance with Standard Operating Procedures set forth by governing law.

Confined Space Entry

Confined space entry for this program would include climbing into or inserting one's head into a pipe, manhole, or catch basin. In general, do not cross the vertical plane defining an outfall pipe or the horizontal plane defining a manhole, unless properly prepared for confined space entry. **IN NO CASE SHALL FIELD CREW MEMBERS WHO ARE UNTRAINED AND/OR UNEQUIPPED FOR CONFINED SPACE ENTRY ATTEMPT TO ENTER CONFINED SPACES.** Confined space entry shall be conducted only by trained personnel with appropriate rescue and monitoring equipment.

Other Hazards

Table 5: Other Outfall Inspection Hazards

Hazard	Prevention
Access	Avoid steep slopes, dense brush and deep water. Report unsafe locations and move on to next location.
Stuck	Avoid wading where bottom sediments are easily disturbed or depths are unknown.
Strong Gas/Solvent Odor	Do not select manhole for sampling
Bodily Harm From Manhole Covers	Use manhole hook and watch for pinch points
Slip	Proper Foot Gear and Use of Rope If Warranted
Falls	Use extended sample collection device; don't cross horizontal or vertical plane at end of outfall
Heat and Dehydration	Adequate Water Intake; Avoid Excessive Exertion on Hot Days
Sunburn	Sunscreen and Appropriate Clothing
Poisonous Plants/Animals	Identify and Avoid
Vicious Dogs	Avoid; Use Animal Repellent if necessary
Water Bodies	Flotation Devices
Ticks	Check Entire Body at End of Each Day
Mosquitoes	Apply Repellent

Test Kit Analysis Safety

In general, safety procedures established by the City Water Department and the Illinois Department of Public Health and related IEPA publications are used. Following are general guidelines.

1. Appropriate gloves (latex or rubber) are worn AT ALL TIMES when handling samples or conducting test kit analyses. Other appropriate Personal Protection Equipment (PPE) is also be worn, as required.
2. Copies of Material Safety Data Sheets (MSDS) are maintained with all test kits. Be familiar with instructions provided in the MSDSs.
3. Always conduct test kit analyses in a well-ventilated area.
4. Wash hands thoroughly with soap and water at every opportunity.

3.3.D.2.c OUTFALL INSPECTION



An outfall inspection is required for outfalls determined to have dry weather flow, or with submerged outlets, based on the pre-screening efforts. Upon arriving at an outfall, the field crew inspects the outfall by approaching the outfall on foot to a proximity that allows visual observations to be made.

Outfalls are assessed to determine which one of the three following conditions applies:

- (1) The outfall is dry or damp with no observed flow,
- (2) Flowing discharges are observed from the outfall, or
- (3) The outfall is partially or completely submerged with no observed flow or is inaccessible.

Scenario 1: No Observed Flow. Under Scenario 1, the field crew should photograph the outfall and complete applicable sections of the *Stormwater Outfall Inspection Data Form (Appendix*

5.3). Use the flow chart, **Figure 7**, to identify applicable sections of the form that must be filled out.

Scenario 2: Observed Flow. Under Scenario 2, the field crew photographs the outfall and complete applicable sections of the *Stormwater Outfall Inspection Data Form (Appendix 5.3)*. Use the flow chart, **Figure 7**, to identify applicable sections of the form that must be filled out, including sampling/testing requirements. The intent is to gather additional information to determine if an illicit discharge is present. Determine the need for on-site testing and obtaining grab samples for laboratory analysis based on the flow chart guidance. Testing results are then used to identify potential sources.

The initial testing results are not intended to document the event for future removal and/or enforcement actions. If the preliminary test results identify a potential illicit discharge an independent laboratory shall be contracted to test an additional sample prior to initiating removal procedures.

Scenario 3: Submerged or Inaccessible Outfall. Under Scenario 3, if standing water is present in an outfall or if it is inaccessible, then complete available information from Sections 1, 2, 3 and 7 of the *Stormwater Outfall Inspection Data Form (Appendix 5.3)*, with appropriate comments being written in the “Remarks” section of the data form. Locating an upstream sampling point may be required if any of the following conditions exist at an outfall:

- The outfall discharge is submerged or partially submerged due to backwater conditions,
- Site access and safety considerations prevent sample collection,
- The outfall is from a facility providing water quality treatment (for example, detention basin outlet), or
- Other special considerations.

Determine the upstream sampling location using the City of North Chicago’s storm sewer atlas. Manholes, catch basins, or culvert crossings can be used for upstream sampling locations. Make reasonable efforts to locate upstream sampling points that are accessible and exhibit flow. If inaccessible, resolve the problem in the office with appropriate supervisory personnel.

 <p>Submerged: More than ½ below water</p>	 <p>Partially submerged: Bottom is below water</p>	 <p>Fully submerged: Can't see outfall</p>
 <p>Outfall fully submerged by debris</p>	 <p>Fully submerged from downstream trees trapping debris</p>	 <p>Partially submerged by leaf debris "back water"</p>
 <p>Trickle Flow: Very narrow stream of water</p>	 <p>Moderate Flow: Steady stream, but very shallow depth</p>	 <p>Significant flow (Source is a fire hydrant discharge)</p>

Figure 6: Characterizing Submersion and Flow
Center for Watershed Protection

3.3.D.2.d OUTFALL ASSESSMENT AND DOCUMENTATION

Complete the *Stormwater Outfall Inspection Data Form (Appendix 5.3)* for all outfall screening and grab sampling activities. All completed forms must be dated, legible, and contain accurate documentation of each outfall inspection. A separate data form must be completed for each outfall.

It is recommended that non-smearing pens be used to complete the forms and that all data be objective and factual. Once completed, these data forms are considered accountable documents and are maintained as part of the City of North Chicago's files. In addition to standard information, the data form is used to record other information that is noted at the time the outfall inspection is conducted (e.g. observations of dead or dying plants, fish kills, algal blooms (excessive algae growth), construction activities, and other activities that might provide information regarding the potential for illicit connections or inappropriate discharges).

3.3.D.2.e DAILY CLOSEOUT

Disposal and Clean-up



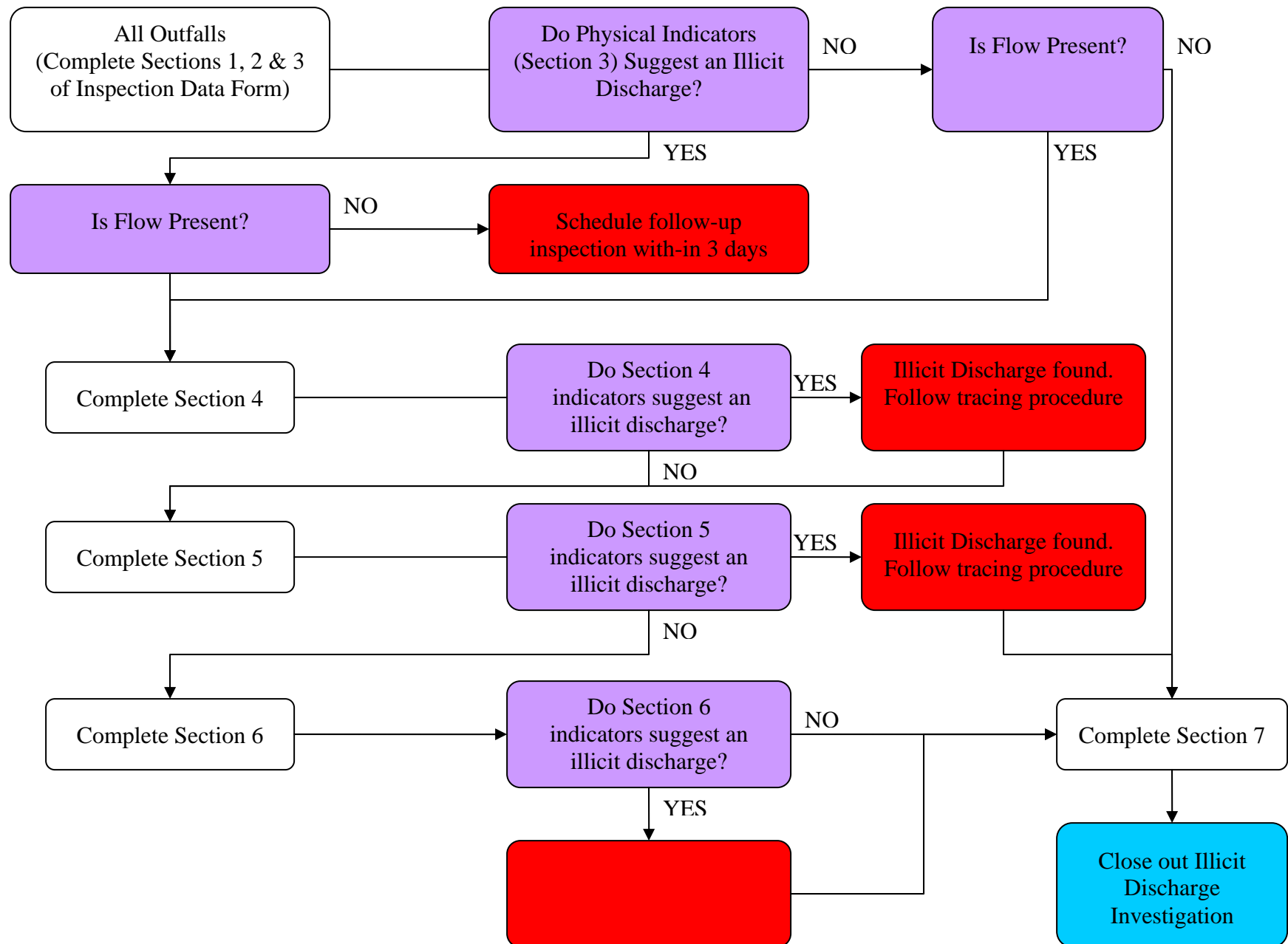
Properly dispose of test waste items per the following table. Before leaving any field inspection site, check the area to ensure that all equipment has been cleaned, collected, and stored. Do not leave any trash or litter at the site.

Item	Field Disposal	Final Disposal
Grab Sample (Uncontaminated)	On Site	-----
Grab Sample (Contaminated by Contact with Test Kit Ampoule)	Liquid Waste Container	Sanitary Sewer
Test Kit Ampoule	Used Ampoule container	Dispose of Container as a Hazardous Waste
Paper Towels/ Latex Gloves	Trash Bags	Municipal Garbage

Office Closeout

In the office, file copies of completed data forms. Also, update the outfall screening scheduling and completion form and plan the next screening day's activities. Discuss any problems locating outfalls with appropriate supervisory personnel so that alternate sampling locations can be identified. Once a month, compile data from the *Stormwater Outfall Inspection Data Form* (Appendix 5.3) onto the *Outfall Inspection Screening Summary Form* (Appendix 5.5).

Figure 7: Outfall Inspection Procedure Flow Chart



3.3.D.3 Follow Up Investigation and Program Evaluation

Follow up investigation is required for all outfalls with positive indicators for pollutant discharges. The outfall assessment results are reviewed to determine the magnitude of the dry-weather pollution problem and to determine the necessary steps to identify and remove the sources of any detected pollutants. **Figure 8** provides a flow chart to aid in follow-up investigations of potential illicit discharges.

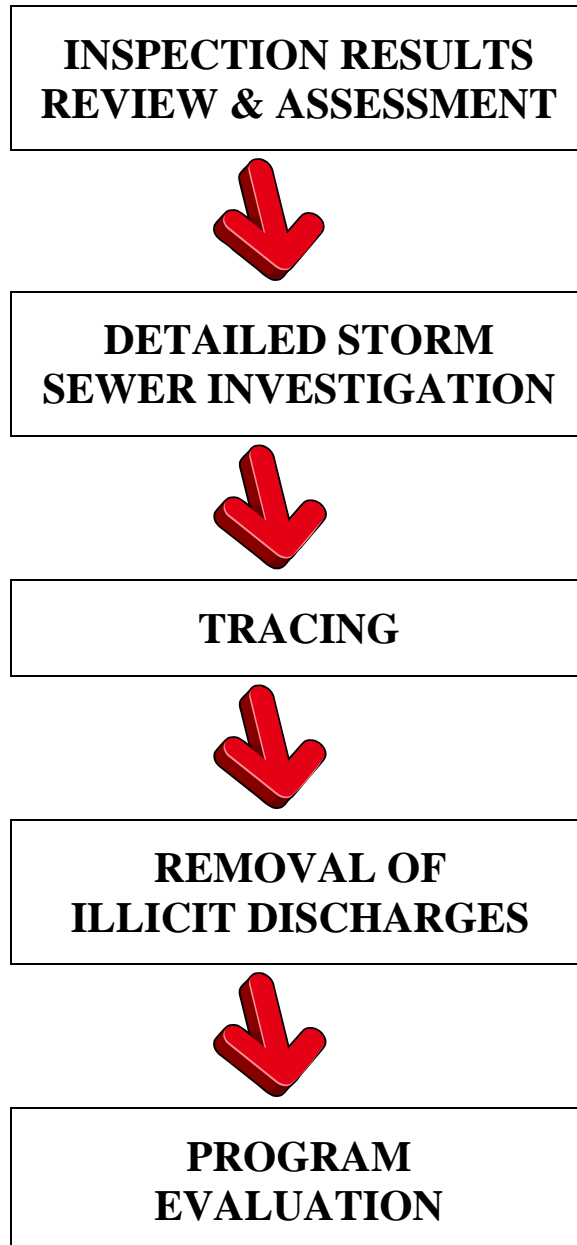


Figure 8: Follow Up Procedure

3.3.D.3.a OUTFALL SCREENING RESULTS REVIEW AND ASSESSMENT

Detailed investigations of the storm sewer system may be required upstream of the outfalls to locate sources of illicit discharges or improper disposal. The need for detailed investigations is based on evaluation of the data from the initial outfall screening. This element of the program serves to detect and remove pollutant sources. This is accomplished by reviewing the ***Outfall Inspection Screening Summary Form (Appendix 5.5)*** to determine if there are outfalls that require a follow up investigation, target sewer system areas for detailed investigation and then conducting intensive field investigations upstream of the polluted outfall to identify potential sources.



3.3.D.3.b INDEPENDENT VERIFICATION

If the initial outfall assessment identifies potential illicit discharges (through either the on-site or off-site testing procedures), additional sampling is required. The results of the inspection and testing should be discussed with the Stormwater Coordinator. Contract an independent laboratory to take and test an additional sample and verify preliminary finding. Use the established procedure to coordinate the independent laboratory sample and testing.

3.3.D.3.c SOURCE IDENTIFICATION

The procedure for detailed storm sewer investigation and source identification has three major components: 1) mapping and evaluation, 2) storm sewer investigation, and 3) tracing.

Mapping and Evaluation

For each outfall to be investigated, a large-scale working map should be obtained (digitally or in paper form) that includes the entire upstream storm sewer network, outfall locations and parcel boundaries indicated. This map product is based on information from the storm sewer atlas and outfall map and can be obtained from the City Engineer. Land use information is evaluated to determine the types of residential, commercial, and industrial areas that might contribute the type of pollution identified at the outfall.

If the contributing area is determined to be non-residential, the available Industrial/Business information should also be reviewed. The pre-treatment inspection, performed by the Water Department or Waste Water Treatment Plant, typically indicates chemicals located on-site at each business. The business type and on-site chemicals are logged into the Industrial/Business Inventory. The Inventory is screened for probable pollutant matches. Business Types, at the time of the SMPP creation, include:

- Assembly,

- Automotive,
- Bank-Loans,
- Car Wash,
- Church,
- Contractor,
- Food Processing (Pet, Candy),
- Government/School,
- Grocery Store,
- Health Club/Gym,
- Landscaping/Nursery,
- Laundromat/Dry Cleaning,
- Manufacturing,
- Meat Packing,
- Medical/Dental/Pharmaceutical,
- Office,
- Printing/Photography,
- Recreations/Park District,
- Residential (Single and Multi-Family),
- Restaurants/Bars,
- Retail,
- Salon/Barber Shop,
- Utility, and
- Warehouse/Distribution.

Make attempts to match detected indicators with upstream activities.

Storm Sewer Investigation



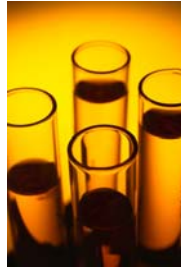
After conducting the mapping evaluation, a manhole-by-manhole inspection is conducted to pinpoint the location of the inappropriate discharge, into the storm sewer / conveyance system. This inspection requires a field crew to revisit the outfall where the polluted dry-weather discharge was detected. The field crew should be equipped with the same testing and safety equipment and follow similar procedures as used during the outfall inspection.

After confirming that dry-weather flow is present at the outfall, the field crew continues moving to the next upstream manhole or access point investigating for dry weather flow. In cases where more than one source of dry-weather discharge enters a manhole, the field crew records this information on the screening form and then tracks each source separately. All sources are tracked upstream, manhole-by-manhole, until the dry-weather discharge is no longer detected.

Finally, the last manhole where dry-weather flow is present is identified and potential sources to that manhole are accessed. This data is important for source identification.

The field crew should also determine whether there has been a significant change in the flow rate between manholes. If the flow rate appears to have changed between two manholes in the system, the illicit connection likely occurs between the two manholes. Changes in the concentration of pollutant parameters could also aid in confirming the presence of an illicit connection between the two manholes.

Tracing



Once the manhole inspection has identified the reach area, between two manholes suspected of containing an inappropriate discharge, testing may be necessary. If there is only one possible source to this section of the storm sewer system in the area, source identification and follow-up for corrective action is straightforward. Multiple sources, or non-definitive sources, may require additional evaluation and testing. The method of testing must be approved by the Water Department Superintendent prior to testing. Potential testing methods include fluorometric dye testing, smoke testing, and/or remote video inspections.

3.3.D.4 Removal of Illicit Discharges

Eight steps are taken to definitively identify and remove an inappropriate discharge to the storm sewer system. These steps are as follows:

- Step 1. Have an outside laboratory service take a grab sample and test for the illicit discharge at the manhole located immediately downstream of the suspected discharge connection.
- Step 2: Conduct an internal meeting with appropriate municipal personnel likely including City Engineer, Building Commissioner, and Water Superintendent to discuss inspection and testing results and remedial procedures.
- Step 3: The Building Commissioner shall send a notification letter to the owner/operator of the property/site suspected of discharging a pollutant. The letter should request that the owner/operator describe the activities on the site and the possible sources of non-stormwater discharges including information regarding the use and storage of hazardous substances, chemical storage practices, materials handling and disposal practices, storage tanks, types of permits, and pollution prevention plans.

- Step 4: Arrange a meeting for an inspection of the property with the Building Department Code Enforcement Officer, and the owner/operator of the property where the pollution source is suspected. Most illicit connections and improper disposal can probably be detected during this step. Notify the site owner/operator of the problem and instruct them to take corrective measures.
- Step 5: Conduct additional tests as necessary if the initial site inspection is not successful in identifying the source of the problem. The City Engineer is responsible for coordinating the determination of the appropriate testing measure to pinpoint the source.
- Step 6: If the owner/operator does not voluntarily initiate corrective action, the Building Department Code Enforcement Office issues a notification of noncompliance. The notification includes a description of the required action(s) a time frame in which to assess the problem and take corrective action. Upon notification of noncompliance, the owner can be subject to any penalties stipulated in the IDDE Ordinance, Chapter 11-4B.
- Step 7: Conduct follow-up inspections after stipulated time frame has elapsed to determine whether corrective actions have been implemented to: 1) remove the illicit connection or 2) eliminate the improper disposal practice.
- Step 8: If corrective actions have not been completed an additional internal meeting with appropriate municipal personnel (likely including City Engineer, Building Commissioner and Water Superintendent) is held to determine appropriate steps to obtain compliance. Appropriate actions may include monetary or other penalties.

Table 6: NPDES-Identified Industrial Facilities

SIC Code	Description
	Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards that are exempted).
1000-1400	Mineral industry, including active and inactive mining operations, with exceptions, and certain oil and gas exploration, production, processing, or treatment operations or transmission facilities.
2400	Lumber and wood products except furniture (except 2434-wood kitchen cabinets)
2600	Paper and allied products (except 2650-paperboard containers and boxes from purchased paperboard and 2670-converted paper and paperboard products)
2800	Chemicals and allied products (except 2830-drugs)
2900	Petroleum refining and related industries (except discharges subject to 40 CFR 419)
3110	Leather tanning and finishing
3200	Stone, clay, glass, and concrete products (except discharges subject to 40 CFR 419)
3300	Primary metal industries
3441	Fabricated structural metal
3730	Ship and boat building and repair
	Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA
	Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under Subtitle D of RCRA
	Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including, but not limited to, those classified as SIC codes 5015 (used motor vehicle parts) and 5093 (scrap and waste materials).
	Stream electric power generating facilities including coal handling sites
	Transportation facilities with vehicle maintenance shops, equipment cleaning operations, or airport deicing operations (except facilities with SIC codes 4221 through 4225) (only those portions of the station that are either involved in vehicle maintenance including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or that are otherwise identified as an industrial station.
	Construction activity including clearing, grading, and excavation activities except: operations that result in the disturbance of less than 5 acres of total land that are not part of a larger common plan of development or sale
THE FOLLOWING CODES REQUIRE A NPDES PERMIT IF CERTAIN ACTIVITIES ARE EXPOSED TO SW	
2000	Food and kindred products manufacturing or processing
2100	Tobacco products
2200	Textile mill products
2300	Apparel and other finished products made from fabrics and similar materials
2434	Wood kitchen cabinets
2500	Furniture and fixtures
2650	Paperboard containers and boxes
2670	Converted paper and paperboard products
2700	Printing, publishing, and allied industries
2830	Drugs
2850	Paperboard containers and boxes
3000	Rubber and miscellaneous products
3100	Leather and leather products (except 3110-leather tanning and finishing)
3230	Glass products, made of purchased glass
3400	Fabricated metal products, except machinery and transportation equipment (except 3441-fabricated structural metal)
3500	Industrial and commercial machinery and computer equipment
3600	Electronic and other electrical equipment and components, except computer equipment
3700	Transportation equipment (except 3730-ship and boat building and repairing)
3800	Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks
3900	Miscellaneous manufacturing industries
4221-25	Farm products warehousing and storage, refrigerated warehousing and storage, general warehousing and storage

3.3.D.5 Program Evaluation

Review the results of the screening program to examine whether any trends can be identified that relate the incidence of dry-weather flow observations to the age or land use of a developed area. Experience gained from the USEPA NPDES program indicates a lower chance of observing polluted dry-weather flows in residential and newer development areas, while older and industrial land use areas having a higher incidence of observed dry-weather flows. See **Table 6** for areas that may be more likely to exhibit dry-weather flows. Examine the screening results to determine whether any such obvious conclusions can be made. If so, these conclusions may guide future outfall screening activities.

Outfalls with positive indicators of potential pollution are investigated to identify upstream pollutant sources. Identified illicit direct connections must be eliminated. However, new sources may appear in the future as a result of mistaken cross connections from redevelopment, new-development or remodeling. Indirect or subtle discharges such as flash dumping are difficult to trace to their sources and can only be remedied through public education and reporting. Therefore, it is expected that to some degree they will continue although at a reduced magnitude and frequency. Although the outfall screening program will be successful in identifying and eliminating most pollutants in dry-weather discharges, the continued existence of dry-weather flows and associated pollutants will require an ongoing commitment to continue the outfall screening program.

The annual inspection screening will determine the effectiveness of the program on a long-term basis and show ongoing improvement through a reduced number of outfalls having positive indicators of potential pollutants. It is logical to assume that after several years of annual screening, the majority of the dry-weather pollution sources will be eliminated.

3.4 Construction Site Runoff Control



The goal of the Lake County Watershed Development Ordinance (WDO) is to ensure that new development does not increase existing stormwater problems or create new ones. The WDO establishes countywide standards for runoff maintenance, detention sites, soil erosion and sediment control, water quality, wetlands and floodplains. These provisions are only applicable for regulated development activities as defined by the WDO. Applicants that hydrologically disturb greater than 1-acre are also required to seek coverage under the statewide construction general permit by filing a Notice of Intent (NOI) with IEPA.

The WDO is implemented primarily at the local level. In October of 2008, forty-two of fifty-three municipalities in the county were "Certified Communities." The designation allows those communities to enforce WDO standards within their own jurisdictions. SMC administers the WDO and issues permits for the developments within the Non-Certified Communities.

The City of North Chicago has adopted the Lake County Watershed Development Ordinance (WDO) and is currently a Certified Community for the review, permitting, inspection and enforcement of the provisions of the WDO. The community designates an Enforcement Officer; this person is responsible for the administration and enforcement of the WDO. The City of North Chicago has created an Inspection and Violation Notification Procedure to ensure compliance with the WDO.

3.4.A Regulatory Program

Applicants are directed to the Engineering Department for information pertaining to the permitting process. Developments that exceed the WDO minimum thresholds are provided with a Lake County Watershed Development Ordinance (WDO) application form. Applicants submit the completed form and supporting documentation to the Engineering Department for review and comment. After the Engineering Department concurs that the applicable provisions of the WDO have been addressed, a permit is issued by the Building Department. Each permit lists any additional conditions that are applicable to the development.

Ordinance provisions include but are not limited, to the following:

- Grading, soil erosion and sediment control plan. The plan must:
 - Prevent discharge of sediment from the site through the implementation of soil erosion control practices, primarily, and sediment control secondarily, and
 - Protect receiving waters, natural areas and adjacent properties from damage which may result from the proposed grading.
- Established inspection duties for the applicant and procedures for inspections;
- Record keeping and reporting procedures;
- Security deposits to ensure faithful performance;
- Enforcement measures to achieve compliance; and
- One year warranty period, for applicable developments.

As part of the permit review process, applicants that hydrologically disturb greater than 1-acre are also required to seek coverage under the statewide construction general permit by filing a Notice of Intent (NOI) with IEPA. During construction, applicants are required to submit to IEPA Incidence of Noncompliance (ION) forms, as necessary. After the site is substantially stabilized, the applicant is required to submit a Notice of Termination (NOT).

3.4.B Responsible Parties

3.4.B.1 Applicant

The applicant is ultimately responsible for ensuring compliant soil erosion and sediment control measures on-site during construction. General contractors, sub-contractors and other hired employees of the applicant can assist the applicant in maintaining a compliant site; however the applicant remains the responsible party. The applicant is also responsible for obtaining all other required state and federal permits, including an NOI with IEPA and upholding all permit conditions (including completing inspection logs).

3.4.B.2 DECI – Designated Inspectors

The purpose of the DECI program is to facilitate positive communication between the City of North Chicago and the permit holder by creating a single point of contact for soil erosion/sediment control issues with the idea that it is easier to prevent soil erosion and sediment control problems than it is to correct them after they have occurred. Further, the program is intended to improve site conditions, minimize environmental impacts, and educate contractors/developers/inspectors about proper soil erosion/sediment control Best Management Practices.

The applicant, for sites that exceed the WDO thresholds per Art. IV, Section B.1.j.2., is required to hire or employ a Designated Erosion Control Inspector (DECI).

- All development with 10 acres or more of hydrologic disturbance
- All development with 1 acre or more of hydrologic disturbance **and** regulatory floodplain **or** wetlands on site or on adjoining properties.

The DECI can work for the permittee's contractor, subcontractor, consultant, etc. He does not have to be a direct employee of the permittee. SMC keeps a list of DECIs that have been approved.

The DECI has the responsibility to conduct inspections as required, document inspections, keep inspections and project plans available on site, report noncompliance issues promptly, recommend soil erosion/sediment control measures. Assuming the DECI is competently completing these steps, the DECI is considered to meet the requirements of the program. Ultimately, liability for a development in noncompliance may fall to the owner, the applicant, the contractor, the developer, the DECI, or anyone else involved as determined on a case by case basis.

Sites that do not require a DECI may still require a designated inspector under the NPDES II permit process. Significant efforts have been made to minimize overlap between the two programs. Currently all sites with greater than 1-ac or more of hydrologic disturbance require a permit from IEPA and a designated inspector (which is more stringent than the DECI requirements). A designated inspector, under the IEPA program, does not need to be a DECI

recognized by SMC; however a DECI can fulfill both rolls. However, the site inspection logs can typically meet the permit conditions of both the WDO and the IEPA.

The DECI reports to the Enforcement Officer. However, SMC administers the DECI program. During the course of a project, the DECI must notify the EO within any if the development site is determined to be noncompliant with the soil erosion and sediment control plan. The City of North Chicago's Stormwater Coordinator should also be contacted within 24-hours. It is highly recommended that the Stormwater Coordinator remind the DECI to also file an Incidence of Noncompliance (ION) with IEPA. If the discharge from the construction site enters a receiving water within the MS4 jurisdictional boundaries, it is highly recommended that the MS4 also file an ION with IEPA.

3.4.B.3 Enforcement Officer

The Enforcement Officer is responsible for administration and enforcement of the provisions of the WDO. Additionally, the Enforcement Officer is responsible for performing inspections and monitoring the development. Review and inspection efforts can be performed by personnel under his/her direct supervision. A full description of the EO responsibilities is included in Appendix E of the WDO. The EO follows established procedures for notifying applicants of deficiencies and obtaining site compliance (i.e. enforcement).

It is also both the right and the responsibility of the Enforcement Officer to ensure that all incidences of non-compliance received from a DECI are resolved. Furthermore it is the Enforcement Officer's right and the responsibility to notify the SMC if a DECI listed by SMC is not adequately performing the DECI responsibilities. SMC may remove a DECI from the approved DECI list. However, a DECI may be removed from a development by the Enforcement Officer at their sole discretion.

3.4.C Minimum Construction Site Practices

A site plan is required to comply with minimum prescribed practice requirements set forth in the WDO. The WDO also allows for the City of North Chicago to require additional measures, above and beyond minimum control measures, to prevent the discharge pollutants from construction sites. Design and implementation guidance is available in the Lake County Technical Reference Manual (TRM) and other reference materials identified in Appendix 5.17 of the SMPP.

Some minimum control measures include the following:

- Construction site sequencing and phasing,
- Preservation of existing vegetation and natural resources (through the runoff volume reduction hierarchy provisions),
- Stormwater conveyance systems (including concentrated flows, diversions, etc.),
- Stockpile management,
- Soil erosion control measures (including blanket and seeding),
- Stabilized construction entrances/exits and haul routes,
- Sediment Control (including silt fence, inlet/outlet protection, ditch checks, sediment traps, sediment basins etc.),
- Wind and Dust control measures,
- Non-stormwater management (including dewatering practices, waste management practices, spill prevention and control practices etc.),
- Construction Buffers, and
- Construction Details.

3.4.D Site Plan Review

The City of North Chicago is a certified community for the enforcement of the Stormwater Provisions of the WDO. The Building Department provides applicants with a variety of documents necessary to obtain municipal permits. The City Engineer requires a petitioner (when applicable) to submit a Watershed Development Permit application for the engineer's files prior to receiving engineering approval. The building permit is not issued until the engineer has approved the plans and given written approval to the Building Commissioner.

The Engineering Department performs a review of the proposed site plan and provides comments to the applicant on any plan deficiencies and/or recommended plan enhancements. The plan review also assists in identifying other approvals that the applicant may be required to obtain. After the Engineering Department concurs that the applicable provisions of the WDO have been addressed a permit is issued. The permit lists any additional conditions that are applicable for the development, including providing prior notification of the pre-construction meeting to the City of North Chicago. The City of North Chicago's attendance of the pre-

construction meeting shall be made a condition of the permit for all major developments. The applicant is required to post the permit at the construction site.

3.4.E Site Inspection Procedures

Representatives of the City of North Chicago are authorized to enter upon any land or water to inspect development activity and to verify the existing conditions of a development site that is under permit review.

The City of North Chicago may inspect site development at any stage in the construction process. For major developments, the City of North Chicago shall conduct site inspections, at a minimum, at the end of the construction stages 1 and 7 listed below. Construction plans approved by the Enforcement Officer shall be maintained at the site during progress of the work. Recommended inspection intervals are listed below:

1. Upon completion of installation of sediment and runoff control measures (including perimeter controls and diversions), prior to proceeding with any other earth disturbance or grading,
2. After stripping and clearing,
3. After rough grading,
4. After final grading,
5. After seeding and landscaping deadlines,
6. After every seven (7) calendar days or storm event with greater than 0.5-inches of rainfall,
7. After final stabilization and landscaping, prior to removal of sediment controls.

Site Inspection Process:

- The City of North Chicago attends the pre-construction meeting on applicable development sites. During the pre-construction meeting the ***Pre-Construction Meeting Form (Appendix 5.6)*** is filled out by the City of North Chicago attendee. It is also recommended that the inspector request to see the SMPP and IEPA NOI for applicable construction sites.
- The applicant notifies the City of North Chicago when initial sediment and runoff controls measures have been installed.
- The City of North Chicago inspects the initial sediment and runoff control measures and authorizes the start of general construction.
- The City of North Chicago inspects the stormwater management system and authorizes additional site improvement activities.
- The City of North Chicago performs site inspections at the recommended intervals listed above and completes the ***SE/SC Inspection Form (Appendix 5.7)***.
- For sites that exceed the WDO thresholds per Art. IV, Section B.1.j.2. a DECI is required, refer to Chapter 3.4.B.2 for additional information regarding the program.

- The City of North Chicago requires as-built documentation of the stormwater management system prior to final site stabilization. Tags of the seed mixes are kept by the developer for inspection and approval. Upon approval of the as-builts, the applicant shall permanently stabilize the site.

3.4.F Complaints

The City frequently receives phone calls regarding a development, either during the review or construction phase. Both site design and construction related phone calls are directed to the City's Enforcement Officer, or designee. Site design comments are handled on a case by case basis. Construction related calls are typically addressed by performing a site inspection.

3.4.G Performance Guarantees

Pre-construction meeting – per City Code

Performance Guarantee (surety) is required for public improvements (i.e. sewer, water, right-of-way work), stormwater management system and landscaping. The Engineers Opinion of Probable Construction Cost (EOPCC) is provided to the City of North Chicago for their review/approval. The required surety amount shall be 110% of City of North Chicago approved EOPCC. In cases where the SMC requires a surety the City of North Chicago will only hold a surety for the portions of the EOPCC that is not being held by SMC. Alternatively, the City of North Chicago will provide SMC with a letter indicating that the City of North Chicago will hold the surety and not reduce the surety amount until SMC approval has been obtained.

The City of North Chicago will hold 5% of the surety for a minimum of 1-yr after site stabilization is complete to ensure that the vegetation is established and no failures occur. For sites with native vegetation, this portion of the surety will be held for a minimum of 3-yr after site stabilization. The applicant may apply for reductions of surety. Refer to the Subdivision Ordinance for information regarding the surety or letter of intent requirements.

3.4.H Violation Notification Procedures

In general the compliance due date should be within 5-working days. However, if the inspector determines that the violation is or will result in significant environmental, health or safety hazards a 24-hour due date should be set. For time-critical violations, the developer should also be advised to complete a Notice of Incidence report with IEPA for all sites that were required to obtain an NOI with IEPA. If the discharge from the construction site enters a receiving water within the MS4 jurisdictional boundaries, it is highly recommended that the MS4 also file an ION with IEPA.

The **SE/SC Inspection Form** is found in **Appendix 5.7**. Step 1 can be initiated by observation of a violation during a routine inspection, or in response to a notice of noncompliance received from a DECI.

Step 1: Violation Is Observed

- The inspector completes the **SE/SC Inspection Form**.
- Photographs of the violation(s) should be taken and saved.
- The Violation shall be described to the construction site contact.
- A copy of the **SE/SC Inspection Form** is provided to the contractor and the developer. The **SE/SC Inspection Form** indicates the remedial measures required and a maximum time frame for action.
- At the end of the indicated time frame the City of North Chicago performs a follow-up site inspection. The inspector attempts to schedule the follow-up inspection with the construction site contact.

Step 2: 1st Follow-Up Site Inspection

The construction site contact shall be notified of the anticipated inspection time. The site is inspected including all items previously documented on the previous **SE/SC Inspection Form**. The inspector will determine if the remedial measures have all been satisfactorily addressed, substantially completed, or if significant non-compliance remains.

- If the remedial measures have been satisfactorily addressed then the **SE/SC Inspection Form** is filled out indicating compliance and provided to the contractor and developer.
- If the inspector determines that the remedial measures have been substantially completed, but not entirely resolved, the inspector shall follow Step 1 above.
- If the inspector determines that the remedial measures have not been substantially completed, the inspector shall follow Step 3 discussed below. Photographs of the violations should be taken and saved.

Step 3: 1st Notice of Violation

A formal **Notice of Violation** letter will be sent to the contractor and developer; see sample letter in **Appendix 5.8**. A copy of the Notice of Violation shall also be provided to the Building Department. The letter will include the following information.

- Description of the violations (including ordinance provisions),
- Mandatory remedial measures, and
- Maximum time frame for resolution (typically 5 working days),

Step 4: 2nd Follow-Up Site Inspection

The inspector will determine if the remedial measures have all been satisfactorily addressed, substantially completed, or if significant non-compliance remains.

- If the remedial measures have been satisfactorily addressed then the **SE/SC Inspection Form** is filled out indicating compliance and provided to the contractor and developer.
- If the inspector determines that the remedial measures have been substantially completed, but not entirely resolved, the inspector shall follow Step 1 above.
- If the inspector determines that the remedial measures have not been substantially completed, the inspector shall follow Step 3 discussed below. Photographs of the violations should be taken.

Step 5: 2nd Notice of Violation

Depending on the severity of the outstanding violations the inspector may issue a Red Tag and a Conditional Stop Work Order upon completion of the inspection. The Stop Work Order allows for the resolution of the violation but no other on-site improvements. Building and/or Occupancy Permits will not be issued and surety reductions will not be entertained until the violation is resolved. A formal **Notice of Violation** letter will be sent, via certified mail, to the contractor and developer; see sample letter in **Appendix 5.8**. A copy of the Notice of Violation shall also be provided to the Building Department. The letter will include the following information.

- Description of the violations (including ordinance provisions),
- Mandatory remedial measures, and
- Maximum time frame for resolution (typically 5 working days).

Step 6: 3rd Follow-Up Site Inspection:

The inspector will determine if the remedial measures have all been satisfactorily addressed, substantially completed, or if significant non-compliance remains.

- If the remedial measures have been satisfactorily addressed then the **SE/SC Inspection Form** is filled out indicating compliance and provided to the contractor and developer.
- If the inspector determines that the remedial measures have been substantially completed, but not entirely resolved, the inspector shall follow Step 1 above.

- If the inspector determines that the remedial measures have not been substantially completed, the inspector shall follow Step 3 discussed below. Photographs of the violations should be taken and saved.

Step 7: 3rd Notice of Violation

The inspector issues a Red Tag and a Conditional Stop Work Order upon completion of the inspection, if one has not already been issued. The Stop Work Order allows for the resolution of the violation but no other on-site improvements. Building and/or Occupancy Permits will not be issued and surety reductions will not be entertained until the violation is resolved.

Representatives from the Building and Engineering Departments shall conduct an internal meeting to discuss the violation and subsequent actions. These actions may include: issuing fines since the 1st notice of violation; draw from surety to enable City of North Chicago to have the remedial measures corrected; seeking City of North Chicago counsel and pursuing injunctive or other legal relief.

A formal **Notice of Violation** letter will be sent, via certified mail, to the contractor and developer; see sample letter in **Appendix 5.8**. A copy of the Notice of Violation shall also be provided to the Building Department. The letter will include the following information.

- Request a meeting with the applicant/development and City of North Chicago staff;
- Description of the violations (including ordinance provisions),
- Mandatory remedial measures,
- Maximum time frame for resolution (typically 5 working days), and
- States additional penalties or measures that will be imposed if the violation(s) persist.

Repeat Steps 6 & 7 until resolution

3.4.I BMP Reference Information

Reference information includes, but is not limited to, the following sources:

- Native Plant Guide,
- Lake County SMC's Technical Reference Manual,
- Illinois Urban Manual,
- SMC's
 - soil erosion and sediment checklist,
 - soil erosion and sediment control notes,
 - typical construction sequencing,
- Construction details are available on the City of North Chicago's website,
- Chicago Metropolitan Agency for Planning (previously Northeastern Illinois Planning Commission) Course Manuals,
- IDOT manuals,
- Center for Watershed Protection documents, and
- IEPA and USEPA publications.

3.4.J Construction Site Waste Control

The WDO includes several provisions that address illicit discharges generated by construction sites. The applicant is required to prohibit the dumping, depositing, dropping, throwing, discarding or leaving of litter and construction material and all other illicit discharges from entering the stormwater management system.

3.4.K Pavement Projects

Pavement resurfacing and maintenance projects are determined through pavement evaluation studies that take place when warranted. Project work shall follow IDOT Standard Specifications and applicable provisions of the WDO. At a minimum, protect drainage structures with inlet filter bags during construction activities.

3.5 Post Construction Runoff Control



The City of North Chicago complies with NDPES permit requirements by incorporating Ordinance and BMP standards to minimize the discharge of pollutants of development projects. This chapter describes how the compliance with stormwater discharge permit requirements for long-term post-construction practices that protect water quality and control runoff flow is achieved.

This SMPP creates and references extensive policies and procedures for regulating design and construction activities for protecting receiving waters. The design and construction site practices selected and implemented by the responsible party for a given site are expected to meet BMP measures described through the Lake County Technical Reference Manual and IEPA's Program recommendations. All proposed permanent stormwater treatment practices must be reviewed and approved by the Enforcement Officer.

3.5.A Regulatory Program

The WDO includes numerous performance standards on Grading, Stormwater and Soil Erosion/Sediment Control that must be met for all parties undertaking construction. The Lake County Technical Reference Manual is a guidance tool that describes BMP and implementation procedures for enforcing the WDO.

3.5.B Long Term Operation and Maintenance

The SMPP includes two long term maintenance plans. These sample maintenance plans are included in **Appendix 5.14**.

- The first plan is the recommended plan for existing detention and stormwater management facilities, whether publicly or privately maintained. The intent of this sample plan is to provide guidance for the maintenance of facilities that do not have an approved plan. If an existing facility already has an adequate plan adequate; this document would supersede the sample plan.

- The second plan is provided to applicants during the permit review period. This plan should be reviewed and enhanced by the applicant to reflect the sites specific design. Receipt of the signed and recorded maintenance plan is required prior to issuance of the WDP or listed as a permit condition.

3.5.C Site Inspections

The inspection program for its general facilities is discussed in detail in Chapter 3.6.A. The inspection procedure for site inspections related to construction activities is discussed in detail in Chapter 3.4.E. This section focuses on post-construction inspections of previously developed sites, streambanks / shorelines, streambeds, and detention / retention ponds.

3.5.C.1 Previously Developed Sites

The City of North Chicago attempts to inspect approximately 100% of all existing properties with stormwater management facilities a year.

- Previously accepted developments are inspected with respect to the approved maintenance plan. A letter indicating the maintenance activity highlights, deficiencies or additional enhancements to the plan should be provided to the responsible party.
- For older developments that do not have a maintenance plan, the City of North Chicago inspects facilities with respect to the sample existing facilities maintenance plan. A letter indicating the maintenance activity highlights and deficiencies should be provided to the responsible party. The sample maintenance plan is provided with the letter and the responsible party is encouraged to implement an annual maintenance program.

3.5.C.2 Streambanks and Shorelines



Annually inspect 100% receiving water streambanks/streambeds and detention basin shorelines in the spring and/or fall pending weather conditions. Stream locations are depicted on **Figure 1** and pond locations are listed on the ***Detention/Retention Pond Checklist (Appendix 5.9)***. Observed erosion, seeding/re-seeding or slope stabilization needs are documented. Documented deficiencies should be reported to the City Engineer who evaluates and determines appropriate remediation activities. Remedial actions might include notifying the property owner or including maintenance activities in the City of North Chicago's work program.

New developments are required to provide a maintenance plan for constructed detention/retention facilities. The recorded maintenance plan for developments permitted through the Lake County Watershed Development Ordinance (WDO) is used, if available, for shoreline areas. Typical BMP for maintenance of these areas are similar to those for a construction site. SMC's streambank/shoreline stabilization manual is used as a starting point in choosing the appropriate BMP for remediation activities.

3.5.C.3 Stream Bed Sediment Accumulation

Annually inspect 20% receiving water flowlines for sediment plumes in spring and/or fall pending weather conditions. Stream locations are depicted on **Figure 1**. Observed accumulation is documented. Documented deficiencies should be reported to City Engineer who evaluates and determines appropriate remediation activities. Remedial actions might include notifying the property owner or including maintenance activities in the City of North Chicago's work program.

3.5.C.4 Detention / Retention Pond Sediment Accumulation

Ensure that new detention/retention ponds are over excavated during construction to account for sediment accumulation. The developer is responsible for ensuring that the design grade is established prior to the City of North Chicago's acceptance of the pond. Pond information, including the design permanent pool pond depths, is added to the ***Detention/Retention Pond Checklist (Appendix 5.9b)*** upon acceptance of the pond.

After the City of North Chicago's acceptance, the permanent pool pond depths should be determined by inspection every five years and logged onto the ***Detention/Retention Pond Checklist (Appendix 5.9b)***. If the inspected pond depth is found to be 2 feet or less from the design depth (i.e. shallower than the design permanent pool depth) this information should be reported to City Engineer who evaluates and determines appropriate remediation activities.

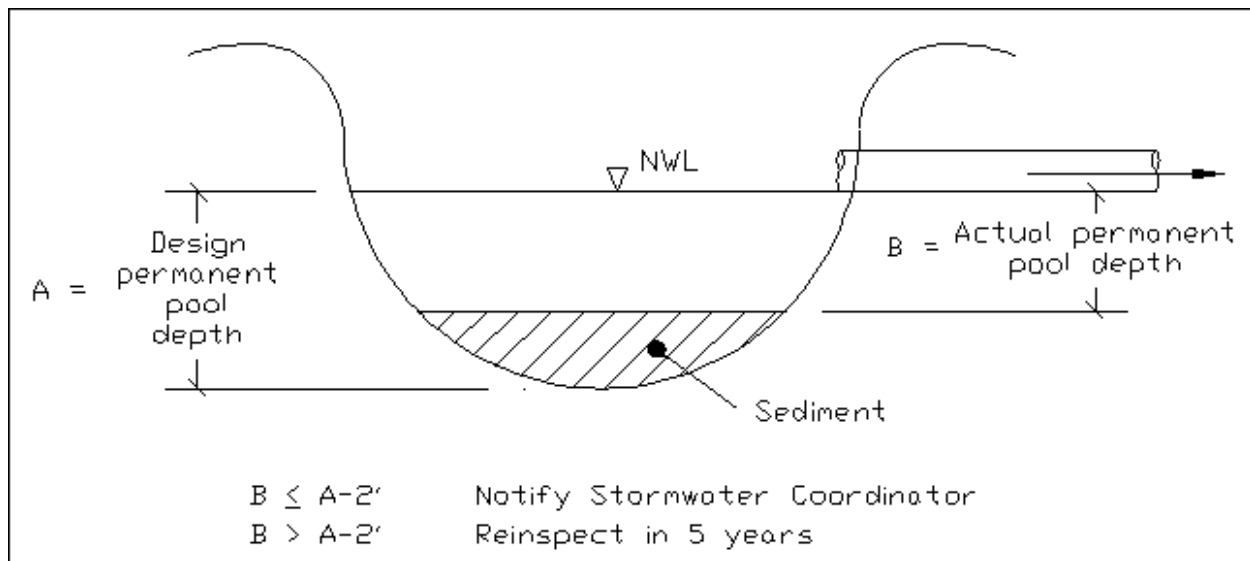


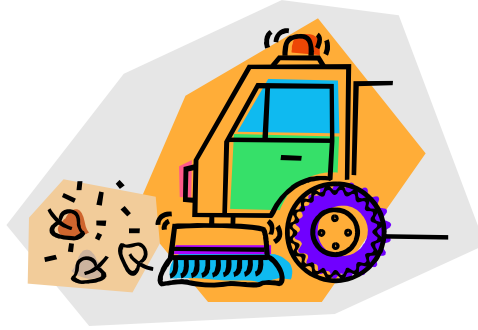
Figure 9: Pond Sediment Accumulation

3.6 Pollution Prevention and Good Housekeeping



The City of North Chicago is responsible for the care and upkeep of the general facilities, municipal roads, its general facilities and associated maintenance yards. Many maintenance activities are most regularly performed directly by staff; however from time to time contractors are employed to perform specific activities. This chapter describes how the compliance with permit requirements is achieved by incorporating pollution prevention and good housekeeping stormwater quality management into day-to-day operations. On-going education and training is provided to ensure that all of its employees have the knowledge and skills necessary to perform their functions effectively and efficiently.

3.6.A Inspection and Maintenance Program



The following chapters describe areas/items that require inspection and their recommended inspection frequency. It further details recommended maintenance activities and subsequent tracking procedures for each of the tasks.

3.6.A.1 *Street Sweeping*

Street sweeping operations are performed to reduce potential illicit discharges and to provide a clean environment. The curb lines of all streets are cleaned on a rotating basis. The rotation maybe changed or interrupted if heavy rain occurs, the sweeper is out of order due to mechanical problems, or the Street Department experiences heavy workload. Each street is typically swept/cleaned approximately weekly during the months of April through the end of November. Sweeper waste is collected and disposed of in the spoil waste area. The intended frequency of street sweeping operations is as follows:

- December to April – no sweeping due to winter operations/conditions
- April to November –daily

3.6.A.2 *Drainageways*

Drainageways include any river, stream, creek, brook, branch, natural or artificial depression, ponded area, lakes, flowage, slough, ditch, conduit, culvert, gully, ravine, swale, wash, or natural or man-made drainageway, in or into which surface or groundwater flows, either perennially or intermittently. Primary drainageways, include Pettibone Creek and the Skokie Drainage ditch. Minor drainageways include roadside and sideyard swales, overland flow paths, pond outlets, etc.

3.6.A.2.a POND OUTLETS

The ***Detention/Retention Pond Checklist (Appendix 5.9)*** is used to determine inspection locations. Structures are added to the checklist after new developments are approved and accepted. Locations identified on the checklists are inspected or when a known problem exists. Observed obstructions are cleared and debris hauled to the spoil waste area. Ponds are inspected and evaluated for a low, medium and high level of flood height according to the following classifications.

Flood Height Classification

- Low – Normal Water Level (NWL)
- Medium – NWL to top of grate
- High – Top of Grate and above

Condition

- Good – outlet is unimpaired, not blocked
- Fair –outlet obstructions observed although outlet is discharging
- Poor – outlet is blocked or obstructed

Comments

Note structural defects or other observances.

Inspections continue until water level recedes to mid-pipe (Medium classification).

If maintenance work is required for a pipe culvert within the City of North Chicago limits but in the State of Illinois right of way, the State's Maintenance Facility, 847-705-4162, is notified. Similarly, the County of Lake, 847-362-3950, is contacted for work within their right of way.

3.6.A.2.b BOX CULVERTS AND BRIDGES

Box Culverts & Bridges are listed on the ***Roadway Culvert/Bridge Checklist (Appendix 5.10)***. Structures are added to the checklist after new developments are approved and accepted. Inspection procedures follow the Pond Outlet discussion above.

3.6.A.2.c DRIVEWAY CULVERTS

Maintenance and replacement of driveway culverts is the property owner's responsibility. A minimum 12" diameter culvert is required by this stormwater management program plan. Permits are required for culvert replacement; a soil erosion and sediment control plan may be required as part of the permit. The Engineering Department inspects the culvert when it is set to grade and prior to backfilling. The Street Department may rod/clean culverts on an as needed basis.

3.6.A.2.d CATCH BASINS

Catch basin locations are identified on the **Storm Sewer Atlas**. The Street Department's goal is to annually clean approximately 100% of all catch basins and/or inlets, to a minimum sump depth of 2 feet when applicable. Spoil waste obtained from catch basin cleaning is disposed of in the spoil waste area. Locations of cleaned catch basins and its condition are logged into the Street Department Tracking System.

Catch basins found to have structural deficiencies are reported to the Water Department. Necessary remedial actions are completed by the Water Department and/or Street Department or incorporated into a capital project. Catch basins that have been cleaned are tracked by the Street Department.

3.6.A.2.e STORM SEWERS

If catch basin debris is at the invert elevation of the downstream pipe (i.e. has completely filled the sump area), then the downstream storm sewer system is also cleaned. Likewise, if a water main break or other heavy flow occurs that flushes potential illicit discharges into the storm sewer system, the receiving storm sewer lines are inspected and then cleaned as necessary.

3.6.A.2.f OTHER INLET AND GRATE CLEANING

Cleaning of these areas occurs on an as-needed basis (e.g. complaints, incidences, standing water, etc). Spoil waste that is obtained from inlet and grate cleaning or vacuuming is disposed of at is disposed of in the spoil waste area. Any waste jetted out is picked up with a clapper bar if possible.

3.6.A.2.g SWALES AND OVERLAND FLOW PATHS

Right-of-way Drainage Swales: The Engineering Department documents observed or reported erosion or sediment accumulation. Areas of significant concern are incorporated into a maintenance program.

Privately Owned Drainage Swales (side/rear yard): Observed or reported erosion or sediment accumulation in privately owned swales are referred to the Building Department for follow-up. Building Department notifies the property owner on an as needed basis for appropriate remediation required.

3.6.A.3 *Landscape Maintenance*



The City of North Chicago maintains care and upkeep of its general facilities, municipal roads, associated maintenance yards, and other public areas. Municipal staff is responsible for Litter and Debris control described in Chapter 3.6.A.4.a below. The City of North Chicago annually

selects and contracts with a landscape contractor, if needed, otherwise landscape work is completed by Street Department personnel. If selected, the landscape contractor is responsible for the remainder of the landscape maintenance program under the supervision of the Street Department. The City of North Chicago is responsible for ensuring that their landscape contractors are provided with training and/or other information to ensure that they adhere to the City of North Chicago's SMPP.

3.6.A.3.a LITTER AND DEBRIS

Litter and debris can accumulate on City of North Chicago property and roadway right-of-ways. The Street Department is responsible for the clean up all public facilities. Clean-up at park and recreation areas is the responsibility of the Park and Recreation District. Other City of North Chicago properties and right-of-ways (including municipal, Township, County and State right-of-ways within the MS4 limits) are cleaned by Street Department personnel, State or County personnel, or volunteer groups on an as-needed basis.

3.6.A.3.b PRIVATE RESIDENCE YARD WASTE

Yard waste and leaves from private residences are collected through contract. Yard waste is collected weekly throughout the growing season. Leaf collection typically starts in October and runs for approximately six to twelve weeks.

3.6.A.3.c FERTILIZERS

A landscape contractor is required to be a licensed applicator for fertilizers. Weed killer and fertilizers are typically scheduled at least once per year, respectively. Contractor specifications incorporate low impact products. The use of pesticides and fertilizers shall be managed in a way that minimizes the volume of storm water runoff and pollutants.

3.6.A.4 *Snow Removal and Ice Control*



During snow removal and ice control activities, salt, de-icing chemicals, abrasives and snow melt may pollute stormwater runoff. To address these potential pollutants, the following procedures for the “winter season” (November 1 through May 1) are implemented.

3.6.A.4.a ROADWAY ICE CONTROL

Use the minimal amount of salt, de-icing chemicals and additives necessary for effective control. Prior to November 1, preparation work to obtain seasonal readiness is completed. These tasks include: inspecting and re-conditioning of spreaders and spinners, install these items onto snow removal vehicles, performing test operations, calibrating distribution rates per National Salt Institution Application Guidelines, and conducting better driver training. The completion of these preparatory tasks helps to ensure that only the necessary level of salt is applied.

Once the ambient temperature is below 20-degrees Fahrenheit, the Street Department Commissioner or Foreman considers the additional use of Calcium Chloride to improve the efficiency of snow melting efforts. If deemed necessary, it is applied to the salt material prior to spreading, at a rate of 7-Gal/CY; a computer controls the application rate, if possible. The Calcium Chloride dispensing system (including pump and sprayers) is primed for operation monthly to ensure proper working conditions.

3.6.A.4.b SALT DELIVERY AND STORAGE

Steps are taken to ensure that the delivery, storage and distribution of salt does not pollute stormwater runoff from the Street Department City Yard. The floor of the salt storage bin is constructed of concrete and adjacent receiving/unloading area is constructed of asphalt. Delivered salt is unloaded in the specified bin. The limits of the salt pile are pushed back from the bin opening to minimize potential illicit runoff. In the event that there is runoff from the salt storage bin or unloading area, the Street Department adds tarps and maintains salt piles using other diversion methods if necessary.

3.6.A.4.c SNOW PLOWING

Snow plowing activities direct snow off the pavement and onto the parkways. This reduces the amount of salt, chemical additives, abrasives or other pollutants that go directly into the storm sewer system. When deemed necessary, the Street Department hauls accumulated snow to designated stockpile locations. These locations are asphalt surface areas. Snow blowing, plowing or dumping into drainageways is not allowed. Once the snow has melted, the stockpile areas are cleaned with a street sweeper removing any debris deposited.

3.6.A.5 Vehicle and Equipment Operations



Vehicle and equipment fueling procedures and practices are designed to minimize or eliminate the discharge of pollutants to the stormwater management system, including receiving waters.

3.6.A.5.a VEHICLE FUELING

The vehicle fueling area contains 3 underground 10,000 gallon metal tanks cathodic protected with 3 fueling dispensers. These tanks are monitored by a cathodic leak detection system. Leak tests are performed weekly. Surface runoff, in the vicinity of the tank farm, is directed into the nearby storm sewer unless a spill occurs and then appropriate action is taken.

3.6.A.5.b VEHICLE MAINTENANCE

Vehicle maintenance procedures and practices are designed to minimize or eliminate the discharge of petroleum based pollutants to the stormwater management system, including receiving waters. This chapter discusses proper handling and disposal of vehicle maintenance by-products such as waste oil, antifreeze, batteries and tires.

Waste Oil

Used motor oil, transmission fluids, gear lubes, brake fluids and other vehicle fluids (except antifreeze) are collected and stored inside the Street Department garage. Typically, the waste oil tank is emptied and the contents removed for recycling.

Antifreeze

Used antifreeze is stored inside the Street Department garage. When 150 gallons is accumulated, a special waste hauler is contacted for collection and disposal.

Batteries

Used batteries are stored in an enclosed covered container at the Street Department garage. Typically, the batteries are collected when purchased from a local vendor.

Tires

Used tires are disposed of as needed by a local vendor. Tires are stored outside at the City Yard until picked up for disposal.

Other

Private certified companies perform all air-conditioning related work; therefore, the disposal of freon is not handled directly by the City of North Chicago. Cleaning fluids, and solvents are contained within an enclosed tank and maintained by a private licensed special waste company.

3.6.A.6 *Animal Nuisance Control*

The Police (Department of Animal Control), upon receiving notification, coordinates the collection of “road kill” from right-of-way areas. The carcasses are disposed of in the Public Works Complex garbage dumpsters.

3.6.A.7 Waste Management



Waste Management consists of implementing procedural and structural practices for handling, storing and disposing of wastes generated by a maintenance activity. This helps prevent the release of waste materials into the stormwater management system including receiving waters. Waste management practices include removal of materials such as asphalt and concrete maintenance by-products, excess earth excavation, contaminated soil, hazardous wastes, sanitary waste and material from within the triple basins.

3.6.A.7.a SPOIL STOCK PILE

The spoil stock pile is located at the Street Department City Yard. Asphalt and concrete maintenance by-products and excess earth excavation materials are temporarily stored in the stock pile. Attempts are made to recycle asphalt and concrete products prior to storage in the spoil stock pile. Licensed waste haulers are contracted to remove and dispose the contents of the spoil stock pile at a licensed landfill as needed. Surface runoff from this area is largely contained by a retaining wall.

3.6.A.7.b CONTAMINATED SOIL MANAGEMENT

Collect or manage contaminated soil/sediment generated during an emergency response or identified during construction activities for treatment or disposal. Attempts are made to avoid stockpiling of the contaminated soil. If temporary stock piling is necessary, place the stockpile on an impermeable liner. Additionally, BMP (presented in the SMC's Technical Reference Manual or the Illinois Urban Manual) are used to protect the downslope of the stockpiled area for erosion downstream. Locate the construction access on the upstream side of the temporary stock pile.

3.6.A.7.c HAZARDOUS WASTE

Store all hazardous wastes in sealed containers constructed of compatible material and labeled. The containers are located in non-flammable storage cabinets or on a containment pallet. These items include paint, aerosol cans, gasoline, solvents and other hazardous wastes. Please refer to chapter 3.6.A.6 for vehicle related hazardous wastes. Do not overfill containers. Paint brushes

and equipment used for water and oil-based paints are cleaned within the designated cleaning area. Contain associated waste and other cleaning fluids within an enclosed area, the area is maintained by the appropriate city department or privately licensed special waste company.

3.6.A.7.d SANITARY WASTE

Discharge sanitary waste into a sanitary sewer or managed by a licensed waste hauler.

3.6.A.7.e TRIPLE BASINS

Floor drains in the garage bay floor area of the Street Department City Yard are directed to an underground Triple Basin. The Triple Basin are vacuumed out and completely cleaned as needed. Vacuumed out material is stored in a bin protected by a retaining wall on a protected impervious surface. The dried material is then transported to a landfill.

3.6.A.8 *Water Conservation & Irrigation*



Water conservation practices minimize water use and help to avoid erosion and/or the transport of pollutants into the stormwater management system. A Lawn and Garden Watering ordinance is in effect whereby watering of lawns and gardens is restricted to between 8:00 PM and 8:00 AM every year between May 15 and September 15 (City code 11-1-10). Maintenance activities (performed by the staff or its contractors) preserve water by utilizing vacuum recovery as opposed to water based cleaning when possible. Additionally, the water main replacement program decreases the possibility for water main leaks. In the event that a water main leak occurs, valve off the leaking section as soon as possible and then repair.

3.6.B Spill Response Plan



Spill prevention and control procedures are implemented wherever non-hazardous chemicals and/or hazardous substances are stored or used. These procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents discharge to the stormwater management system and receiving waters. The following general guidelines are implemented, when cleanup activities and safety are not compromised, regardless of the location of the spill:

- Cover and protect spills from stormwater run-on and rainfall, until they are removed,
- Dry cleanup methods are used when ever possible,
- Dispose of used cleanup materials, contaminated materials and recovered spill material in accordance with the Hazardous Waste Management practices or the Solid Waste Management practices of this plan,
- Contaminated water used for cleaning and decontamination shall not be allowed to enter the stormwater management system,
- Keep waste storage areas clean, well organized and equipped with appropriate cleanup supplies, and
- Maintain perimeter controls, containment structures, covers and liners to ensure proper function.

3.6.B.1 Non-Hazardous Spills/Dumping

Non-hazardous spills typically consistent of an illicit discharge of household material(s) into the street or stormwater management system. Upon notification or observance of a non-hazardous illicit discharge, Street Department personnel implement the following procedure:

- Sand bag the receiving inlet to prevent additional discharge into the storm sewer system, as necessary. It may be necessary to sand bag the next downstream inlet.
- Check structures (immediate and downstream). If possible, materials are vacuumed out. The structure(s) are then jetted to dilute and flush the remaining unrecoverable illicit discharge.

- Clean up may consist of applying “Oil Dry” or sand and then sweeping up the remnant material.
- After containment and cleanup activities have been performed, the City Engineer (Stormwater Coordinator) fills out the *Spill Response Notice* (**Appendix 5.12**) and distributes to adjoining residences/businesses. In residential areas, the hanger should be provided to residences on both sides of the spill and on both sides of the street.
- Fire Department personnel document the location, type of spill and action taken and then provides the information to the Stormwater Coordinator who then completes the *Indirect Illicit Discharge Tracking Form* (**Appendix 5.13**). .
- If a person is observed causing an illicit discharge, public safety personnel including building department personnel are notified and appropriate citations issued by the appropriate public safety personnel including building department personnel.

3.6.B.2 *Hazardous Spills*

Upon notification or observance of a hazardous illicit discharge, the municipal employee follows the following procedure:

- Call 911, explain the incident. The appropriate public safety personnel responds;
- The Street Department or appropriate public safety personnel provides emergency traffic control, as necessary;
- The Fire Department evaluates the situation and applies “Oil Dry” or other appropriate material as necessary;
- The Fire Department’s existing emergency response procedure, for hazardous spill containment clean-up activities, is followed;
- Fire Department personnel document the location, type of spill and action taken and then provides the information to the Stormwater Coordinator who then completes the *Indirect Illicit Discharge Tracking Form* (**Appendix 5.13**). .

3.6.C Employee Training



The City of North Chicago's practice is to provide education and training to all of its employees to ensure that they have the knowledge and skills necessary to perform their functions effectively and efficiently. The purpose of the Employee Stormwater Training Program is to teach appropriate employees about the following:

- Stormwater characteristics and water quality issues;
- The roles and responsibilities of the various Departments, and individuals within these Departments, regarding implementation of the SMPP to consistently achieve Permit compliance;
- Activities and practices that are, or could be sources, of stormwater pollution and non-stormwater discharges; and,
- How to use the SMPP and available guidance materials to select and implement best management practices.

3.6.C.1 Training Approach

Employees are encouraged to attend all relevant training sessions offered by the QLP and other entities on topics related to the goals/objectives of the SMPP. Additionally, the City of North Chicago will develop employee training programs with curricula and materials tailored to specific functional groups. Refer to **Table 7**. The materials focus on stormwater pollution prevention measures and practices involved in routine activities carried out by the various functional groups. Training materials primarily focus on revisions to the various programs (that were in place prior to the acceptance of the SMPP).

Table 7: Employee Responsibilities

Functional Group	Area of Responsibility	Members
Planning and Design	Responsible for overseeing the development and implementation of best management practices through the project planning and design phase for construction projects.	Engineering Department
Construction	Responsible for overseeing the implementation of best management practices relating to the construction stage of projects (private and public).	Engineering Department
Maintenance	Responsible for development and implementation of best management practices relating to the maintenance of facilities, infrastructure and properties.	Public Works Department

3.6.C.2 Training Schedule and Frequency

The initial training program was offered prior to the acceptance of the SMPP in 2009. Digital and hard copies of the training materials will be kept and shared with applicable new employees as part of their job introduction. Revisions/enhancements to the SMPP will be approved by the Stormwater Coordinator and then shared with applicable employees. The Stormwater Coordinator will monitor the potential need for overall refresher material distributions and offer additional training as necessary.

Employees are encouraged to share information with other employees via email or other formats. Information may include:

- updates and news which might enhance pollution control activities,
- feedback from field implementation of best management practices, or
- new product information.

4 Program and Performance Monitoring, Evaluation and Reporting



The SMPP represents an organized approach to achieving compliance with the stormwater expectations of the NPDES Phase II program for both private and public activities within the City of North Chicago. Land development, redevelopment and transportation improvement projects were required to comply with the provisions of the WDO prior acceptance of the SMPP. Additionally, the City of North Chicago had numerous written and unwritten procedures for various tasks. This SMPP documents and organizes previously existing procedures and incorporates the objectives of the WDO to create one cohesive program addressing pre-development, construction, post-development activities and municipal operations.

This chapter describes how the City of North Chicago will monitor and evaluate the proposed stormwater pollution prevention plan based on the above stated objective. As part of the stormwater management program, the City of North Chicago:

- reviews its activities,
- inspects its facilities,

- oversees, guides, and trains its personnel, and
- evaluates the allocation of resources available to implement stormwater quality efforts.

This chapter describes how program monitoring, evaluation and reporting will be accomplished.

4.1 Performance Milestones

Previously established ordinances and programs implement many of the anticipated tasks. The following schedule describes general performance expectations.

- Within 6 months following the acceptance of the SMPP, applicable employees will receive training regarding the implementation of the SMPP.
- Within 1 year following the acceptance of the SMPP, program enhancement items within Chapter 3 will be implemented, except for the IDDE program milestones discussed below. Refer to Chapter 2.1 for a description of tasks associated with the implementation of the SMPP.
- Within 3 years following the acceptance of the SMPP, the Outfall Inspection Procedure will be completed for all pipes identified, during the pre-screening efforts, as having dry weather flow.
- Within 5 years following the acceptance of the SMPP, tracing and removal procedures will be completed for all pipes identified, during the Outfall Inspection Procedure, as contributing illicit discharges to receiving waters.

4.2 Program Monitoring and Research

Currently water quality sampling/monitoring is not required under the NPDES Phase II program. Therefore, monitoring efforts focus on qualitative, not quantitative, examination of the stormwater practices. It is anticipated that the USEPA and IEPA programs will evolve to require water quality monitoring and sampling. Future efforts may involve collecting information on the characterization of discharges from outfalls, identifying other sources of pollutants, characterizing the receiving waters, sampling construction site discharges, identifying the performance of existing and potential enhanced stormwater pollution control measures. The City of North Chicago will comply with future federal and state mandates.

The Stormwater Coordinator will monitor research conducted by others regarding the effectiveness of various alternative stormwater practices, procedures and technologies. The City of North Chicago will continue to seek innovative stormwater practices and technologies. Information and guidance obtained through the MAC meetings and other sources will be incorporated into this SMPP as practical. This information will be used to provide insight into how the program may need to evolve.

4.3 Program Evaluation

The primary mechanism for evaluating the program and ensuring that the field staff has adequate knowledge is supervision by responsible managers. Management personnel include the City Engineer, Street Commissioner, Water Superintendent, Building Commissioner, Fire Chief (or shift commanders) and appropriate code enforcers and foremen. Management support tasks include observing and evaluating design, construction and field personnel as they implement the requirements of the SMPP on both municipal and private projects, and maintenance personnel as they conduct their assigned activities. These responsibilities were outlined in detail in Chapter 2: Program Management.

The following types of questions/answers are discussed annually between the Stormwater Coordinator, Managers and field staff.

- Are proper stormwater management practices integrated into planning, designing and constructing both City of North Chicago and private projects?
- Are efforts to incorporate stormwater practices into maintenance activities effective and efficient?
- Is the training program sufficient?
- Is the SMPP sufficient?
- Are the procedures for implementing the SMPP adequate?

5 Appendices

5.1 List of Acronyms

5.2 Stormwater Outfall Screening Equipment Checklist

5.3 Stormwater Outfall Inspection Data Form

5.4 Outfall Sampling Report

5.5 Outfall Inspection Screening Summary Form

5.6 Pre-Construction Meeting Form

5.7 Soil Erosion and Sediment Control Inspection Form

5.8 Sample Notice of Violation Letter

5.9 Detention/Retention Pond Checklist

5.10 Roadway Culvert/Bridge Checklist

5.11 Pool Dewatering Fact Sheet

5.12 Spill Response Notice

5.13 Indirect Illicit Discharge Tracking and Summary Forms

5.14 Sample Maintenance Plans

5.15 Yearly Tracking Forms

5.16 General Permit ILR40

5.17 Bibliography and References