

**COMBINED SEWER OVERFLOW
OPERATIONAL AND MAINTENANCE PLAN**

September 2007

**City of Park Ridge, Illinois
NPDES Permit # ILM580014**

6. OPERATIONAL AND MAINTENANCE PLAN

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**CITY OF PARK RIDGE, ILLINOIS
NPDES PERMIT # ILM580014**

CHAPTER 1 - CSO O&M PLAN OBJECTIVES

This plan was developed in compliance with the requirements of the City's National Pollutant Discharge Elimination System (NPDES) Combined Sewer Overflow (CSO) General Permit No. ILM580014. The primary objective of this plan is to provide a program for effectively improving the city's combined sewer overflow management. More specifically, the plan has been developed to comply with the following eight requirements of the NPDES CSO permit:

- Collection system inspection on a regular scheduled basis
- Sewer, catch basin, manhole, and regulator cleaning and maintenance on a regular scheduled basis
- Inspections are made and preventative maintenance is performed on all pump/lift stations
- Collections system replacement, where necessary
- Detection and elimination of illegal connections
- Detection, prevention, and elimination of dry weather overflows
- The collection system is operated to maximize storage capacity and the combined sewer portions of the collection system are operated to delay storm water entry into the system
- The collection system is operated to maximize treatment

CHAPTER 2 - COMBINED SEWER OVERFLOW INVENTORY

GENERAL INFORMATION

The City of Park Ridge lies entirely within the Des Plaines River watershed. About one-half of the community drains directly to the Des Plaines River. The rest of the community drains to five local tributaries of the Des Plaines River. The area is relatively flat with ground slopes averaging about 2 feet per 1000 feet.

The entire City falls within the service area of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The combined sewers of the City drain to MWRDGC interceptor sewers which empty into Tunnel and Reservoir Plan (TARP) facilities and then on to MWRD wastewater plants for treatment.

The Park Ridge sewer system includes 132.83 miles of combined sewers in four drainage areas. The four sewer systems as shown on Exhibit 1:

1. Devon Avenue System – An irregular shaped area about 1,238 acres bounded on the north generally by Crescent Avenue and Belle Plaine Avenue, on the east by Canfield Road, on the south by Higgins Road, and on the west by Dee Road.
2. Touhy Avenue System - An irregular shaped area of about 737 acres bounded on the north generally by Elm Street, on the east by Merrill Avenue and East Avenue, on the south generally by Crescent Avenue and Belle Plaine Avenue, and on the west by Talcott Road.
3. Sibley Street System – An irregular shaped area of about 385 acres bounded on the north generally by Oakton Street, on the east by Oriole Avenue, on the south generally by Elm Street, and on the west by Talcott Road.
4. Northwest System – An irregular shaped area of about 1,223 acres bounded on the north by the city limits, on the east by Western Avenue, on the south generally by Oakton Street, and on the west by city limits. There is one cross connection with a sewer in the Village of Niles, to provide relief should either system become overloaded.

Each sewer system is comprised of lateral, branch, trunk and relief sewers.

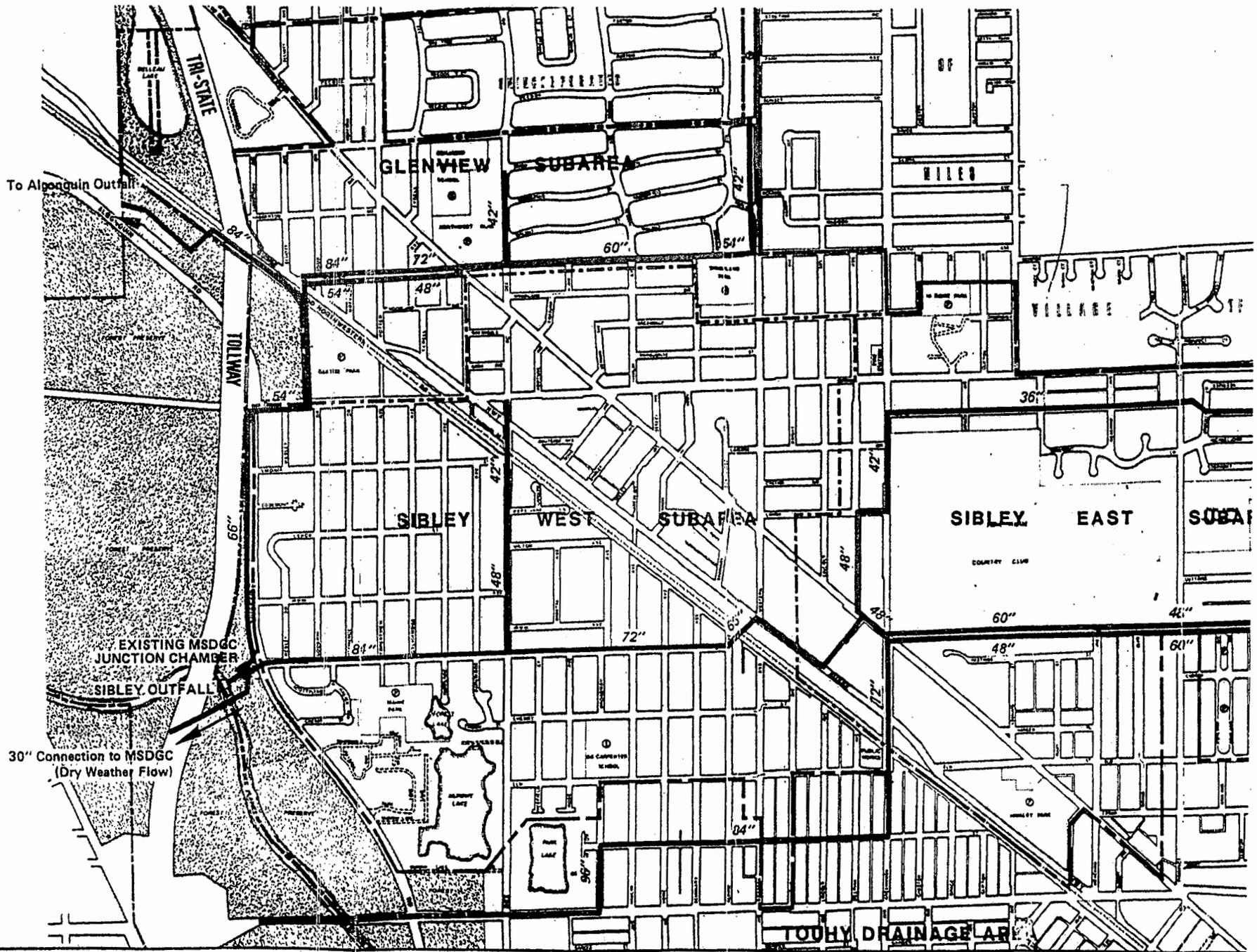
Lateral Sewer – A sewer that discharges into a branch or trunk sewer and has no other sewer tributary to it.

Branch Sewer – A sewer that receives water from a relatively small drainage area including more than one lateral sewer and discharges into a trunk sewer serving more than one branch sewer.

Relief Sewer – A sewer built to carry the flows in excess of the capacity of an existing sewer.

Combined Sewer Outflow Locations

<u>Discharge Number</u>	<u>Location</u>	<u>Receiving Water</u>
005	Algonquin Road(E) 84" (bridge abutment)	Des Plaines River
002	Sibley Ave (E) 66"	Des Plaines River
006	Sibley Ave (E) 84"	Des Plaines River
003	Touhy Ave (E) 72"	Des Plaines River
007	Touhy Ave (E)96"	Des Plaines River
004	Devon Ave (E) 102"	Des Plaines River
008	Devon Ave (E) 42"	Des Plaines River



LEGEND

- Existing Trunk Sewer
- Drainage Area Boundary
- Drainage Subarea Boundary
- Diversion Structure

EXHIBIT 1

In each of the four sewer systems both sanitary sewage and stormwater runoff are carried in the same pipes to diversion chambers on the east bank of the Des Plaines River. The dry weather flow (sanitary sewage) is separated from the wet weather flow (stormwater) by weirs and baffles in a chamber and diverted to the Metropolitan Water Reclamation District of Greater Chicago's intercepting sewer, located along the west bank of the Des Plaines River. The Sibley water shed has a pump station on the Des Plaines River. This station lifts the wet weather flow to appropriate elevations to reduce sewer backup. The Metropolitan Water Reclamation District (MWRDGC) intercepting sewer conveys the sewage and the pre-determined volume of stormwater to the Stickney Sewage Treatment Plant, operated by the MERDGC. During and after a rainfall the sewage and stormwater are combined within the sewer pipe. When this combined mixture reaches the diversion chamber, only the sewage near the bottom drops to the MWRDGC intercepting sewer. The excess flows over the weir, baffle and pump station and is discharged directly to the Des Plaines River.

Relief Sewer Systems

Between 1961 and 1986 the City of Park Ridge built five relief sewers referred to as Stages I, II, III, IV and V Relief Sewers. These large diameter sewers (36 inches to 102 inches) were designed to carry overflows from the existing trunk sewers. The overflows following a rainfall are discharged from the existing combined sewers to the lower relief sewers through weirs, diversion structures, drop manholes, and the Sibley pump station.

Sources of Combined Sewage

Sewage – The spent water supply including domestic and commercial wastes.

Stormwater – Rainwater that flows over the ground surface during and for a short time after a storm. The runoff is collected by roof drains, yard drains, and street and paved area drains.

Groundwater – Water enters the system through foundation drains, sump pumps, open pipe joints, broken pipes, and deteriorated manhole joints.

The MWRDGC Deep Tunnel System

The Metropolitan Water Reclamation District of Greater Chicago is responsible for collecting and treating sewage. It is not feasible to expand collecting sewers and treatment plants sufficiently to handle peak storm flows. Overflows are diverted to the rivers, thereby contaminating the waterways.

Through the combined efforts of the MWRDGC, the City of Chicago, the State of Illinois, and the Federal government, a plan was developed to reduce the overflow of sewage to the rivers. The plan includes a system of large diameter tunnels and storage reservoirs cut in bedrock. Overflows from the trunk and relief trunk sewers will fall freely through dropshafts to the deep tunnel system. Park Ridge is served by a deep

tunnel under the Des Plaines River with dropshafts located at points where overflows are now being discharged to the river. The deep tunnel project reduces contamination of waterways. The design flows accommodated by TARP are:

Algonquin	420 cfs
Sibley	1190 cfs
Touhy	848 cfs
Devon	762 cfs

If the flows are exceeded, the system will operate as it does today.

Sewer System

The City of Park Ridge's sewer system consists of the following:

- 2,835 catch basins
- 8,049 inlets
- 3 sanitary lift stations (Exhibit 2)
- 132.83 miles of sewer (Exhibit 3)
- 1 storm sewer lift station (Exhibit 4)

Exhibits 2, 3 and 4 show the location, number and type of pumps and the actual length of each size diameter of sewer in Park Ridge. In addition, Exhibit 3 shows the amount and diameter size of existing sewer that has been lined, with the CIPP method. This is detailed in the maintenance section of this report.

CHAPTER 3 - COMBINED SEWER OPERATION

The goal is to establish continuous and preventative procedures for the proper operation and maintenance of the city's combined sewer system during dry and wet weather flows. This program aims to ensure a proper, satisfactory and safe state of repair for the city's combined sewer system. The purpose of the maintenance is to reduce excessive inflow and/or infiltration in the system, to prevent basement sewer backups, adverse surcharging of the manholes, reduction of solids during "first flush" conditions and discharge at overflows/outfalls.

INVENTORY

The City is in the process of compiling all of its sewer system records into a geographical information system. The base data has been input and field personnel will have paper copies of the map to mark any necessary changes based upon their field observations. The sewer map will be updated continuously and the latest version will be available on the City's computer network for use by City staff. In addition, updated paper copies will be distributed to field personnel twice a year.

INSPECTION

Any special appurtenances in the sewer system, such as lift stations, City-owned junction chambers, combined sewer overflows, flap gates, etc., will be inspected periodically on a schedule established by the Director of Public Works.

Manholes: All manholes will be inspected on a five-year cycle. Every manhole will be inspected for the following, and the results of the inspection will be noted for the necessary repair work, if any. As far as practicable, the inspections should be scheduled in the periods of high ground water.

1. Inflow through the lid - Whether the manhole is located where storm runoff could accumulate around and over the lid, and enter the manhole through pick/vent holes, or through the space between the lid and the frame. This could be remedied by installation of a gasket seal cover or solid watertight cover with concealed pick holes.
2. Frame Seal - The manhole frame should be sealed watertight with the cone or adjustment rings. If signs of water leakage are noted, the frame should be removed and resealed.
3. Adjustment Rings - The existing adjustment rings between the frame and cone will be inspected for water tightness. If a leak(s) is observed, the frame and the rings should be removed and resealed. Any brick/block adjustment rings should be removed and replaced with precast concrete rings.
4. Manhole Walls - To be inspected for signs of leaks. Leaking walls may be repaired by chemical grout sealing. Poured-in-place concrete liners or guniting may be considered for brick/block manholes with multiple defects.

5. Manhole Base and Pipe Invert(s) - To be inspected for signs of leaks. Chemical grouting is the most likely repair method.
6. Bench - To be inspected for erosion of the bench. Eroded benches should be repaired by an appropriate method, ranging from application of mortar of an appropriate type to repour of the bench.
7. Steps - To be inspected for leaks at the holes the steps are grouted into, and the condition of the step itself. Possible repair methods include regrouting and/or replacement of the step.

Sewers: All sewer opening(s) in a manhole shall be visually inspected using a high intensity lamp and a mirror, to the extent visible from the manhole for the signs of obstructions, roots, sediment deposits and other defects. Sewer reaches are televised in conjunction with ongoing paving and water main improvements. The tapes of televised sewers are retained by the city.

Detention Pond Inspection: Detention ponds shall be inspected annually and cleaned or repaired as necessary.

Creek and Outfall Structures: All creeks and outfall structures shall be inspected twice annually and be cleaned or repaired as necessary.

Flow Monitoring: If visual or other inspections indicate possible excess flow problems in certain subsystems, flow monitoring should be performed at key manholes. Smoke testing, dye testing and excavations may be required in some subsystems where complaints or backup causes are difficult to locate.

Building Inspections: If other inspections indicate that the increased flow may be a source of inflow/infiltration (1/1) located on private property, an inspection of such property, including any building(s) on it, will be conducted.

Maintenance staff, meter readers, and building inspectors will be familiarized with the sewer use ordinance so that unauthorized connections to the sewer can be identified and disconnected. Also, they will ensure that these connections are not reconnected later.

Rehabilitation and Maintenance Work: The rehabilitation work determined necessary to be done, as a result of the inspections described above, will be scheduled as soon as possible. Contemporary and modern methods suitable for such repairs will be used. When necessary, an outside contractor will be used to make the appropriate repairs.

MAINTENANCE

Catch Basin Cleaning: This procedure is performed using a vactor-type machine. The operation occurs on a five-year cycle between March 15th and November 1st, or more often as necessary. The material removed during the cleaning process is disposed of as "landscape" waste.

Procedure for Catch Basin Cleaning:

1. Arrive at location with vactor truck. Remove cover and position the suction tube to proper angle.
2. Hook up suction tube to hose.
3. Lower tube, suck out debris and mud. High pressure water nozzle is used to loosen debris
4. After cleaning, inspect structure and sewer for any repairs that may be necessary.

Sewer Flushing: Jetting and/or root cutting is performed on all sewers once every five years. Sewers with a history of problems are serviced more frequently as necessary.

Procedure for Root Cutting:

1. Arrive at location with jet truck.
2. Attach proper size root cutter to jet hose, i.e. for a 10" sewer line use 10" root cutter.
3. Root cutting proceeds from manhole to manhole. Maximum length of 600'.
4. Debris and roots are pulled backed to the point of entry manhole. This removed material is disposed of as "landscape" waste.
5. After completion of process, inspect structure and sewer for any repairs that may be necessary.

Procedure for Sewer Flushing:

1. Arrive at location with jet truck.
2. Attach proper jetting head to jet hose.
3. Insert jet hose into sewer.
4. Jet sewer using water under high pressure to remove any blockages and clean line.
5. Inspect structure and sewer for any repairs that may be necessary.

Sibley Lift Station Maintenance There are a series of grates to keep debris from entering the wet well side where the pumps are located. The grates are cleaned bimonthly or as needed.

Street Sweeping: To reduce litter and other materials from streets and curbsides, the City of Park Ridge maintains a street sweeping program that sweeps 240.6 residential lane miles twice a month. Business district streets are swept three times a week. During leaf collection season, streets are swept weekly according to a defined schedule. Street sweepings do not occur during below freezing temperatures or after a heavy rainfall.

RECORD KEEPING

The Director will maintain the dated records for a minimum of five years. Records shall be kept regarding collapsed and blocked sewers, basement backups, street flooding, collection system complaints, inspection logs, and excess flow levels at combined sewer

overflows. Said records will be in such a form that can be easily accessed for reference or review. The data collected will form the basis for projecting a sequence of future maintenance work.

CHAPTER 4 - COMBINED SEWER IMPROVEMENTS

CAPITAL IMPROVEMENTS

In 1986, Harza Engineering Company was contracted to create a Stormwater Management Master Plan for the City of Park Ridge. The objective of this plan was to perform a comprehensive technical assessment of the existing sewer system, recommend system improvement projects which would reduce the frequency and severity of flooding, and evaluate economic feasibility over a 20-year period for these proposed public improvements.

In response to flooding from a significant storm event on October 13, 2001, Christopher Burke Engineering was contracted to create an updated Stormwater Management Master Plan. The updated plan was completed in 2003. The plan identified twelve problem areas in the City and recommended a series of projects, including combined sewer separation and relief sewers, to alleviate flooding. The recommended projects will be incorporated into the City's Capital Improvement Program in the years to come.

ADMINISTRATIVE PROCEDURES FOR NEW DEVELOPMENT

The City of Park Ridge will not issue a building permit until approval is granted by the MWRDGC for compliance with its Sewer Permit Ordinance. In addition, the City is in the process of updating its Building Code to include the following four requirements of the NPDES CSO general permit:

- Prohibit introduction of new inflow sources to a sanitary sewer
- Require that new construction tributary to the combined sewer system be designed to minimize and/or delay inflow contribution to the combined sewer system.
- Require that inflow sources on the combined sewer system be connected to a storm sewer, within a reasonable period of time, if a storm sewer becomes available
- Provide that any new building domestic waste connection shall be distinct from the building inflow connection, to facilitate disconnection if a storm sewer becomes available.

CHAPTER 5 - OTHER CSO PERMIT EFFORTS

Pursuant to the NPDES CSO Permit Requirements, the City of Park Ridge is also responsible for reporting of any wet or dry weather overflow discharges, public notification of any discharges, and creation of a Pollution Prevention Plan.

DISCHARGE MONITORING

The MWRD has installed telemetry equipment at CSO's along the Des Plaines River, including the Park Ridge CSO's, in order to monitor any wet or dry weather overflows. The MWRD will submit Discharge Monitoring Reports to the IEPA detailing any overflows. In order to avoid a duplication of efforts, the City has partnered with the MWRD in their monitoring program. The City is responsible for visual monthly inspection and records.

PUBLIC NOTIFICATION PROGRAM

The MWRD is created a public notification plan that involves signage at the CSO locations and website notification of any wet weather or dry weather overflows, based upon their telemetry flow monitoring data. The City has partnered with the MWRD in their public notification program.

POLLUTION PREVENTION PLAN

As required by the CSO Permit, the City has created an independent Pollution Prevention Plan. The plan complements, and in some areas is repetitive of this Operational and Maintenance Plan and the City's NPDES Phase II Plan. The city also provides pamphlets on numerous subjects on pollution prevention at City Hall.