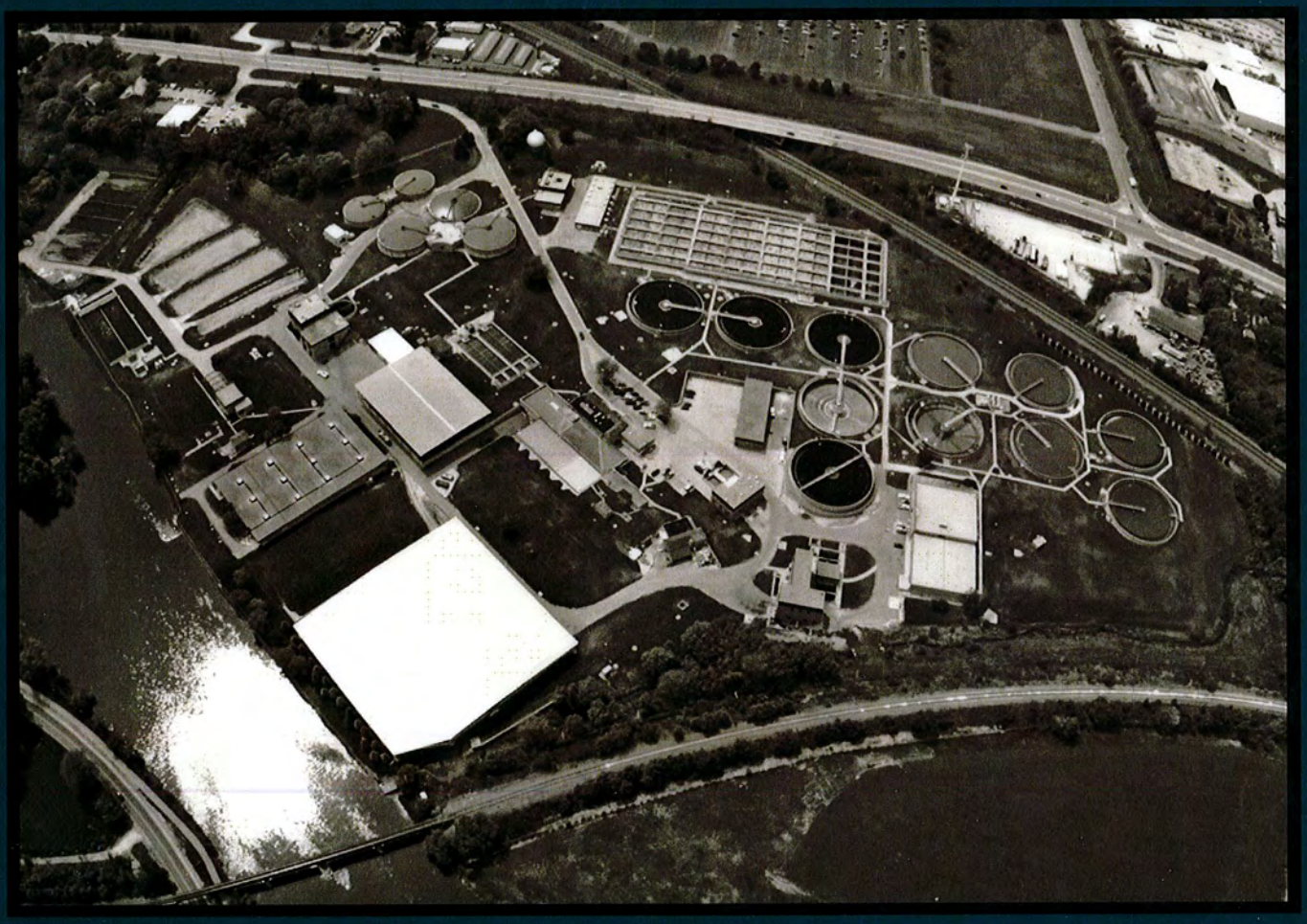
APPENDIX G

CITIZENS ADVISORY COMMITTEE

Fox Metro
Water Reclamation District

COMBINED SEWER OVERFLOW (CSO) LONG TERM CONTROL PLAN (LTCP) APPENDIX G

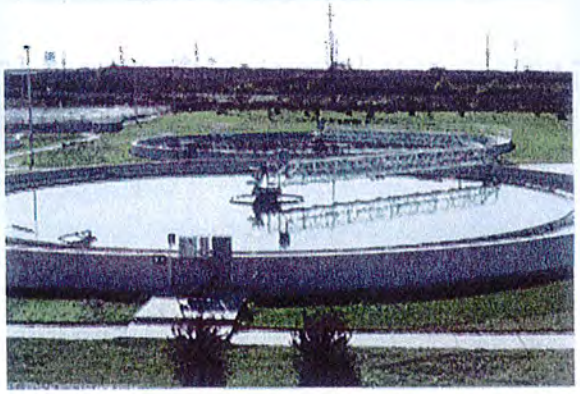


March 31, 2010

Prepared By:

Walter E. Deuchler Associates, Inc.

Consulting Engineers



Fox Metro
Water Reclamation District

CSO LONG TERM CONTROL PLAN

Citizens Advisory Committee (CAC)

Prepared By:

WALTER E. DEUCHLER ASSOCIATES, INC.

Consulting Engineers

CAC MEMBERS

Name	Organization	Phone Number	E-Mail
Darryl Devick	City of Aurora	630-844-3621	ddevick@aurora-il.org
Judith Sotir	Fox Metro WRD	630-906-4128	jsotir@waubonsee.edu
Tim Pollowy	Fox River Ecosystem Partnership	630-264-8020	tpollowy@heyassoc.com
Bill Donnell	Fox Valley Park District	630-897-0516	bdonnell@fvpd.net
Fran Caffee	Sierra Club, Valley of the Fox Group	630-859-1687	fran.caffee@sierraclub.org
Joe Wywrot	United City of Yorkville	630-553-8527	jwywrot@yorkville.il.us
Michael Pubentz	Village of Montgomery	630-896-1354	pubentz@ci.montgomery.il.us
Michael Glock	Village of North Aurora	630-897-1457	mglock@vil.north-aurora.il.us
Jerry Weaver	Village of Oswego	630-554-3242	jweaver@oswegoil.org
Brad Merkel	Village of Sugar Grove	630-466-7508	bmerkel@sugar-grove.il.us

SUPPORT STAFF

Name	Organization	Phone Number	E-Mail
Tom Muth	Fox Metro WRD	630-301-6801	tmuth@foxmetro.dst.il.us
Jeff Humm	Fox Metro WRD	630-301-6804	jhumm@foxmetro.dst.il.us
Roy Harsch	Drinker Biddle & Reath	312-569-1441	Roy.Harsch@dbr.com
Philippe Moreau	Walter E. Deuchler Associates, Inc.	630-897-4651	pmoreau@deuchler.com
John Frerich	Walter E. Deuchler Associates, Inc.	630-897-4651	jfrerich@deuchler.com

MEETING SCHEDULE

Date	Time	Topic
April 29, 2009	11:00 a.m. to 1:00 p.m.	Background and History of the Combined Sewer System
May 27, 2009	11:00 a.m. to 1:00 p.m.	Wastewater Treatment Plant Characterization
June 24, 2009	11:00 a.m. to 1:00 p.m.	Current Facility Planning Efforts
July 21, 2009	11:00 a.m. to 1:00 p.m.	Sensitive Areas
August 26, 2009	11:00 a.m. to 1:00 p.m.	Fox River Water Quality Assessment
October 28, 2009	11:00 a.m. to 1:00 p.m.	Fox River Water Quality Modeling
March 23, 2010	10:00 a.m. to 2:00 p.m.	CSO Control Technologies; Recommended LTCP; Financial Capability Assessment; Implementation Plan; and Recent Regulatory Issues

Unless altered at a previous meeting, all meetings will be held in the Fox Metro Water Reclamation District W.J. "Ben" Baines Memorial Administration Building located at 682 State Route 31, Oswego, IL.

ABBREVIATIONS AND DEFINITIONS

ADF	Average Daily Flow or Average Dry Weather Flow
CAC	Citizens Advisory Committee
CFS	Cubic Feet per Second – a measurement of flow rate
CMAP	Chicago Metropolitan Agency for Planning
CS	Concentrated Sludge
CSO	Combined Sewer Overflow – the discharge from a CSS at a point prior to a POTW
CSS	Combined Sewer System – wastewater collection system which conveys sanitary wastewater and storm water through a single pipe system to a POTW
CWA	Clean Water Act
DAF	Design Average Flow – the average of the daily volumes to be received for a continuous 12-month period of the design year
EFE	Excess Flow Effluent
FCE	Final Clarifier Effluent
FMWRD	Fox Metro Water Reclamation District
FPA	Facility Planning Area
GT	Gravity Thickeners
HGWT	High Ground Water Table

HP	Horsepower
I&I	Infiltration and Inflow
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
Infiltration	Water other than wastewater that permeates into a sewer system (including sewer service connections and foundation drains) from the surrounding soils and backfill material through such means as defective or deteriorated pipes, pipe joints, connections, and manholes
Inflow	Water other than wastewater that enters a sewer system (including service connections) from direct connections such as, but not limited to, roof leaders, garage drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage
LGWT	Low Ground Water Table
LTCP	Long Term Control Plan
MGD	Million Gallons per Day – a measurement of flow rate
NIPC	Northeastern Illinois Planning Commission
NPDES	National Pollutant Discharge Elimination System
PCB	Polychlorinated biphenyl – Any of a family of industrial compounds produced by chlorination of biphenyl, noted primarily as an environmental pollutant that accumulates in animal tissue with resultant pathogenic and teratogenic effects
PCE	Primary Clarifier Effluent
Peak Hourly Flow	The largest volume of flow to be received during a one hour period

Peak Instantaneous Flow	The maximum flow rate to be received at any one instant in time
pH	A measure of the acidity or basicity of a solution
POTW	Publicly Owned Treatment Works
Primary Contact	Any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing
Primary Treatment	First stage of wastewater treatment – employs mechanical and physical unit processes to separate and remove floatables and suspended solids and to prepare wastewater for biological treatment
PS	Primary Sludge or Pumping Station
ROW	Right-of-Way
RS	Raw Sewage
Secondary Contact	Any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingesting appreciable quantities of water is minimal, such as fishing, commercial and recreational boating and any limited contact incident to shoreline activity
Secondary Treatment	Second stage of wastewater treatment - utilizes microorganisms in biological reactors to feed on dissolved and colloidal organic matter; as these microorganisms reduce biochemical oxygen demand and turbidity (suspended solids), they grow, multiply, and form an organic floc, which must be captured and removed in final settling tanks
SRLF	State Revolving Loan Fund
Tertiary Treatment	Also known as advanced treatment; final stage of wastewater treatment – removes specific residual substances, trace organic materials, nutrients, and other constituents that are not removed by biological processes to raise the effluent quality before it is discharged to the receiving environment (river, lake, etc.).
TPAD	Temperature Phased Anaerobic Digestion

TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

MEETING AGENDA

CAC Meeting No. 1
April 29, 2009
11:00 a.m. to 1:00 p.m.

Welcome and Introductions (Tom Muth)	11:00 a.m.
Presentation (John Frerich)	11:20 a.m.
Topic: Background and History of the Combined Sewer System	
Lunch and Open Discussions	12:20 p.m.
Adjournment	1:00 p.m.

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POINTS FOR TODAY'S DISCUSSION

1) General Background of CSOs and LTCP
   a. Basic definitions
   b. Requirements
   c. Role and Responsibility of CAC

2) History of Fox Metro WRD CSS and CSO
   a. Initial Construction
   b. Historical Improvements

3) Questions

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WHAT IS A CSS?

A wastewater collection system which conveys sanitary wastewater and storm water through a single pipe system to a publicly owned treatment works (POTW).

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WHAT IS A CSO?

The discharge from a Combined Sewer System at a point prior to the POTW.

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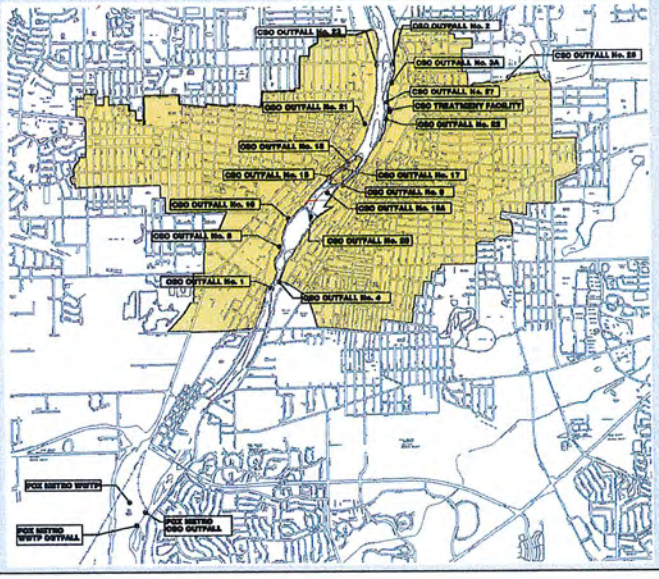

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CSO REGULATIONS

CSOs are point sources subject to:

1) Clean Water Act
2) USEPA CSO Control Policy
3) Illinois Pollution Control Board
4) IEPA NPDES permit

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WHAT IS A LTCP?

A long range plan to provide site-specific, cost-effective CSO controls that will provide for the attainment of water quality standards.

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ELEMENTS OF A LTCP

1) Characterization, Monitoring and Modeling
2) Public Participation
3) Sensitive Areas
4) Evaluation of Alternatives
5) Cost/Performance Considerations
6) Operational Plan
7) Maximization of Treatment at the POTW
8) Implementation Schedule
9) Post-construction Compliance Monitoring

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LTCP WILL MEET THESE REQUIREMENTS

IEPA

Full Treatment of
- Peak dry weather flow
- 2.5 x ADF
- 57 % of First Flush

Complete or Primary Treatment for 65% of flows > 2.5 x ADF

Flow > 10x DAF: Remove Solids, Floatables and "Offensive" Materials

4 to 6 overflows per year, or

Elimination or capture for treatment of a min. of 85% of the volume of combined sewage, or

Elimination or capture for treatment of a min. of 85% of the mass pollutants

* IPCB Exception Modified Illinois Specific Requirements

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LTCP MINIMUM LEVEL OF TREATMENT

1) **Primary clarification**
2) **Solids and floatables disposal**
3) **Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect public health**

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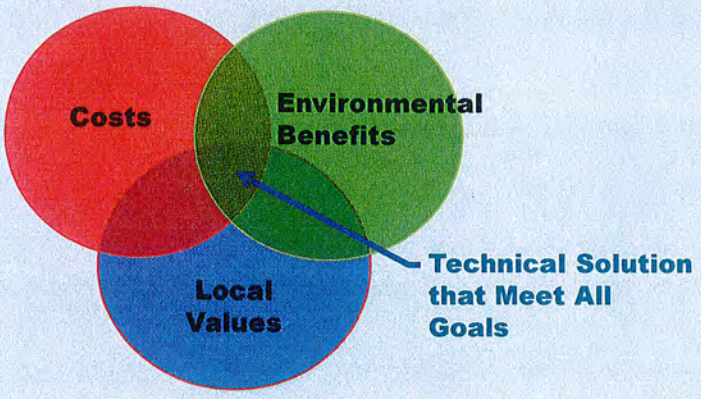
ULTIMATELY LTCP WILL

1) Meet Federal/State Regulatory Requirements
2) Satisfy 3 Constraints



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CAC - ROLES AND RESPONSIBILITIES

1) Provide Guidance to LTCP Development
   - ✓ ID Issues (Sensitive Areas, Control Methods, etc.)
2) Balance Water Quality Benefits and Social Values Against Economic Costs
   - ✓ Alternatives to Address Priorities
3) Serve as Liaisons Between Constituencies and CAC (Inform – Feedback Loop)
4) Advocate Approval of Recommended LTCP to Representative Constituencies

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HISTORY OF CSOs

Late 1800's – First combined sewers constructed in the City of Aurora

1926 – Formation of the Aurora Sanitary District

1929 – Completion of construction of the first sewage treatment plant and original intercepting sewers

1972 – Clean Water Act

Mid 1970's – Aurora Sanitary District and City of Aurora form CSO Partnership

1976 – Sanitary Sewer Evaluation Survey

1978-82 – WWTP Expansion

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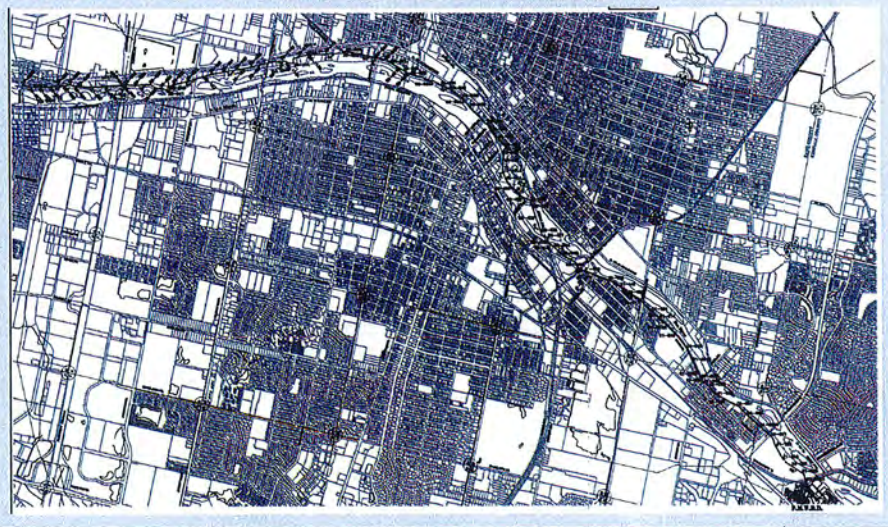
ORIGINAL INTERCEPTING SEWERS



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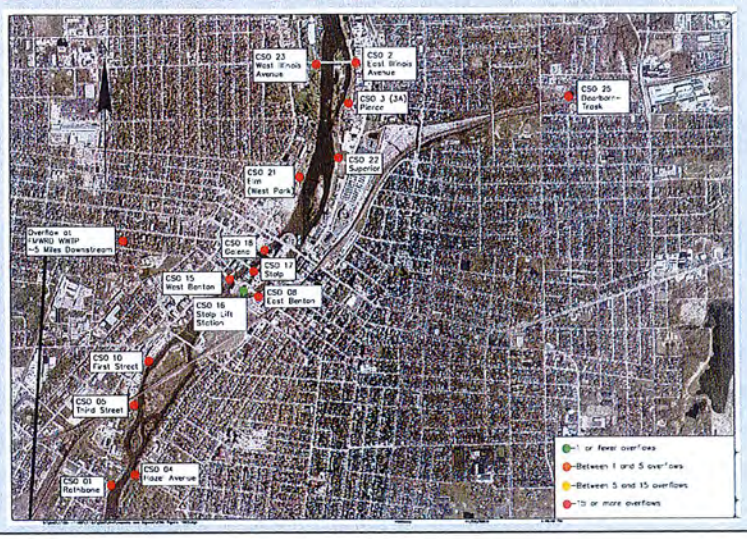
CSO FREQUENCY IN 1983



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HISTORICAL IMPROVEMENTS

Water Pollution Control Board CSO (1988) provided an exception to IAC Subtitle C, Chapter 1, section 306.305:

- ✓ **Complete treatment of peak dry weather flow;**
- ✓ **Complete treatment of up to 2.5 x average dry weather flow;**
- ✓ **Complete treatment of 57% of first flush; and**
- ✓ **Complete or primary treatment of 65% of flows in excess of 2.5 x average dry weather flow.**

Special Condition 14 from FMWRD NPDES IL 0020818

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HISTORICAL IMPROVEMENTS

CSO Exception Required:

1) **System Improvements $ 12.7 M-1983 ($ 26.9 M 2008)**
   - ✓ **11 unique system improvements identified including sewer reinforcement, flow re-routing, sewer separation, weir raising, and overflow elimination.**
2) **FMWRD Treatment Facility $10.8 M-1983 ($22.8 M 2008)**
   - ✓ **All flows must be screened and metered**
   - ✓ **All flows up to 74 mgd must receive primary clarification prior to and during any bypassing.**
   - ✓ **All flows up to 68 mgd must receive full treatment.**

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HISTORICAL IMPROVEMENTS

As a Response to Post Construction Inspection, a Plan of Study (1991) Recommended:

- ✓ **Screening of OVF No. 4 (Hazel) $415k-1998 ($600k-2008)**

- ✓ **Completed review of OVF No. 1 (Rathbone)-found no impact**

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HISTORICAL IMPROVEMENTS

As a Response to Post Construction Inspection, a Plan of Study (1991) Recommended:

- ✓ **CSO Treatment Facility $12M-1997 ($17.6M-2008) – Treated CSO 27**
- ✓ **Indian Creek Interceptor $2.1 M-1996 ($3.2M-2008)**
- ✓ **East Bank Interceptor $1.5 M-1998 ($2.2M-2008)**

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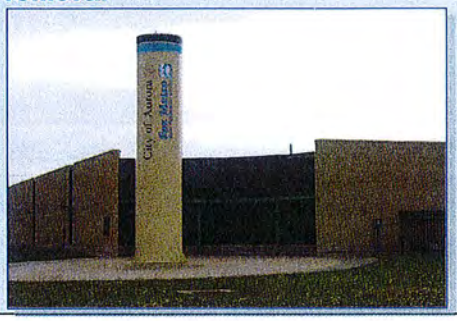
HISTORICAL IMPROVEMENTS

Develop screening, primary clarification and disinfection for 4 CSO locations:

- ✓ **Functional in 1999**
- ✓ **21.8 mgd capacity for 'full primary treatment'**
- ✓ **45.8 mgd screening and grit removal**
- ✓ **USEPA Training Facility**
- ✓ **$17.6M-2008**



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HISTORICAL IMPROVEMENTS

The City of Aurora has implemented 23 separate drainage improvement projects totaling well over $98 M (2008)

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INVESTMENT IN REDUCING WET WEATHER CSOs

Description	Dollars (2008)
System Improvements	$ 26,900,000
FMWRD Wet Weather Improvements	$ 22,800,000
CSO Facility	$ 17,600,000
Screening at OVF No. 4	$ 600,000
Indian Creek Interceptor	$ 3,200,000
East Bank Interceptor	$ 2,200,000
Drainage Improvements	$ 98,000,000
TOTAL	**$171,300,000**

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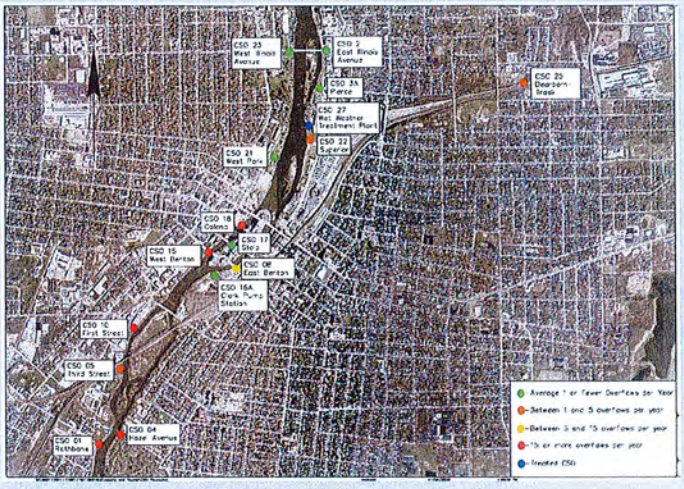
CSO FREQUENCY (2005-2007)



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QUESTIONS...

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CONSULTING ENGINEERS

A SHORT HISTORY OF THE AURORA SANITARY DISTRICT AND A BRIEF DESCRIPTION OF ITS TREATMENT PLANT

By Walter E. Deuchler, *Engineer*

Reprinted from Proceedings of Illinois Association of Sanitary Districts, 1929-1930.

DAVID B. PIERSEN
Trustee, The Aurora Sanitary District

ELWYN A. BERNBROCK
Vice-President, The Aurora Sanitary District
(Business, real estate, vice-Pres., Aurora Real Estate Board)

PETER G. HARTZ
President, The Aurora Sanitary District

ROBT. J. WING
Attorney, The Aurora Sanitary District

GEO. L. THON
Treasurer, The Aurora Sanitary District
(Cashier of Aurora National Bank)

"A SHORT HISTORY OF THE AURORA SANITAY DISTRICT, AND A BRIEF DESCRIPTION OF ITS TREATMENT PLANT"

By Walter E. Deuchler, *Engineer*
The Aurora Sanitary District, Aurora, Illinois, May, 1930

Prior to the completion of the Aurora Sanitary District's sewage treatment plant in the summer of 1929, all the sewage from the City of Aurora was emptied from the combined system of sewers serving the City directly into the Fox River. For the past fifteen years there had been a noticeable pollution of the river during its low stages, which gradually became more obnoxious with the increase in population of the City. This condition finally led to a demand from several groups of progressive citizens for a means of financing a sewage treatment plant, and eventualy resulted in the creation of the Aurora Sanitary District.

WALTER DEUCHLER
Engineer, The Aurora Sanitary District

Shortly after the formation and organization of the District in 1926, its engineers were authorized to proceed with the studies and investigations necessary for a preliminary treatment plant design and an estimate of its construction cost. Studies of the variation of flow in Fox River were prepared; tests of the river water both above and below the City were made to determine its degree of pollution; measurements of flows of sewage in the several sewer outlets were made together with estimates of the populations contributing thereto; studies and analyses were made of all domestic and manufacturing wastes entering the river within the District limits, and estimates of the future growth in population of the District were prepared.

These studies disclosed an average dry weather flow of 90 gallons per capita per day, with a wet weather flow extending over periods of several weeks of 175 gallons per capita per day. The strength of the domestic sewage measured in terms of its biochemical oxygen demand was found to be normal, as indicated by an oxygen demand of 0.21 pounds of oxygen per capita per day. Based on a population of 40,000 people, 8,400 pounds of oxygen would be required daily to prevent putrefaction of the domestic sewage. Factory wastes were similarly studied and were found to require approximately 1,200 pounds of oxygen per day,

indicating that these wastes were not a serious treatment problem for the district.

During warm weather, a flow of one cubic foot per second of unpolluted river water will contain about 40 pounds of dissolved oxygen per day, of which 15 pounds are necessary to maintain fish life in the stream. The calculated flow in Fox River necessary to obtain this minimum requirement for the oxidation of the Sewage when treated by dilution only, was found to be 400 cubic feet per second. With the anticipated increase in the population of the District, a proportionately greater rate of flow will be required to satisfy this minimum oxygen demand until in 1950 a flow of 800 cubic feet per second would be required for the treatment of the raw sewage by dilution. Studies of the river flows over a period of years showed that flows in excess of 400 cubic feet per second were available on an average of 75 per cent of the time, while flows of more than 800 cubic feet per second occurred but 45 per cent of the time. This analysis clearly indicated that a type of sewage treatment should be installed which would reduce the oxygen demand to an amount less than that which can be supplied by the stream flow when at its low stages.

The question of a proper site for the proposed sewage treatment plant was next investigated. An ideal site for such a plant should be isolated from both present and future urban development, should be relatively low and level in elevation and with sub-soil of such character as to provide economy in plant construction; should include a sufficient acreage of moderately priced land for both present needs and future growth; and should be conveniently located with reference to railway siding facilities and an electrical energy source. The present plant site on the west bank of Fox River approximately one (1) mile south of the Village of Montgomery, and three and one-quarter (3¼) miles down stream from the business section of the City of Aurora, was found best to meet all these requirements and was therefor recommended to the District for purchase.

A main intercepting sewer was next planned, running northerly from the plant site along the westerly bank of Fox River to a point opposite Hurds Island, thence across the river through two inverted siphons connected by a section of sewer across Hurds Island, and thence northerly along the easterly bank of Fox River to Illinois Avenue.

The several sewer systems of the City of Aurora discharge into the river through eleven major outlets, all of which were planned to connect into this main intercepting sewer. The outlets at Hazel Street on the east bank of the river, and at Holbrook Street on the west bank of the river were planned to connect with the main interceptor through inverted siphons crossing the river, while the Illinois Avenue outlet was planned to connect

with the interceptor through a gravity line suspended from the Illinois Avenue Bridge.

A number of the buildings adjoining the river through the business district, are served with private sewers connected directly into the river. Many of these outlets were found to be too low in elevation to connect with the projected main intercepting sewer by a gravity flow. These outlets were planned to be connected with small intercepting sewers laid along the river's edge and discharging into two automatic pumping stations. From the pumping stations it was planned to pump the sewage through force mains into the main intercepting sewer.

Through the business district, and where future enlargements of the intercepting sewers would prove exceptionally costly, the sewers were planned of sufficient capacity to carry the maximum flow which will ultimately come to them. In general the intercepting sewers were planned to have a capacity sufficient to carry 350 gallons per capita per day for the probable population of the Aurora Sanitary District in the year 1970. This basis of design offers a large capacity for carrying the first storm water flows of the combined sewers to the treatment plan, requiring overflows from the combined sewers directly into the river only at the occasional times when the combined sewers of the City are carrying large amounts of storm water. It is estimated that at the present time storm water to the amount of ten times the normal dry weather flow will be carried to the plant before any direct discharge into the river occurs. The size of the main intercepting sewer as planned varied from a maximum of 69 inches internal diameter at its connection with the treatment plant to a minimum of 30 inches internal diameter at its northerly terminus at Illinois Avenue.

Comparative studies of the recognized methods of sewage treatment were next made to determine the most economical method which would produce a satisfactory effluent for local conditions. In this analysis Imhoff type tanks were compared with saparate sedimentation and sludge digestion tanks; and for secondary treatment trickling filters were compared with the activated sludge process using separate sludge digestion for disposing of the activated sludge. Estimates of the annual costs including fixed charges, depreciation, labor, supplies and power for plant operation clearly indicated that separate sedimentation and sludge digestion tanks for primary treatment and trickling filters for secondary treatment provided the most economical means of securing a satisfactory degree of purification of the district's sewage. The plant designs used in these estimates provided sufficient capacity to treat the sewage of 67,000 people, the estimated population of the District in 1940.

The location and elevation of the plant site selected and the

design of the main intercepting sewer were such that all the sewage, with the exception of that received from the two small automatic pumping stations hereinbefore described would flow to the treatment plant and through the sedimentation tanks by gravity. The detritor tank and sedimentation tanks were planned to allow the passage of the sewage through them by gravity, thus permitting the use of high efficiency pumps in lifting the clarified

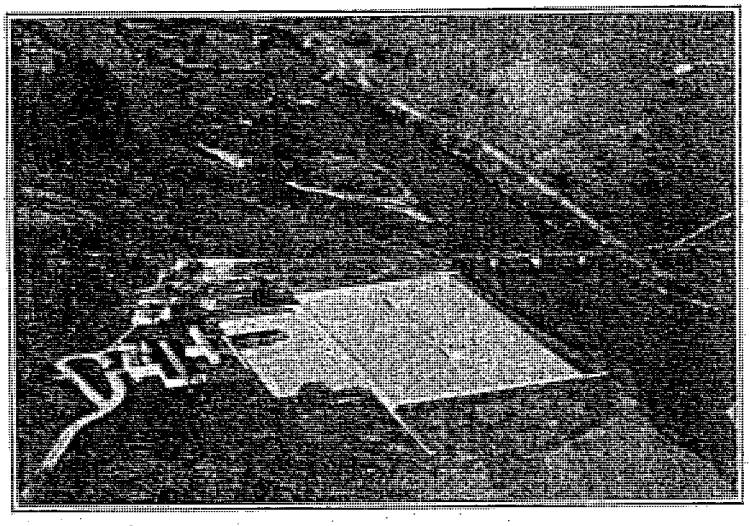

FIGURE 1
Aerial view of the Treatment Plant and the treatment Works Grounds.

sewage to the dosing tanks for secondary treatment on the stone filter beds. An overflow from the sedimentation tanks with a direct outlet into the river was also planned, making possible the elimination of secondary treatment and its attending pumping costs when such treatment is unnecessary due to high stages of flow in the river.

The proposed plan of sewage treatment was submitted to the voters of the district at a special election and the issuance of bonds in the sum of $1,000,000 for construction of the work was authorized by a vote of 23 to 1. The work of preparing detailed plans of intercepting sewers and treatment plant and of executing contracts in accordance therewith followed, resulting in the completion of the project in the summer of 1929.

A brief description of the various units of the sewage treatment plant of the Aurora Sanitary District is hereinbelow submitted:

Overflow Wier:

The outlet of the main intercepting sewer is connected with the screen chamber through a channel 5 feet wide by 40 feet long fitted with an overflow wier. When the interceptor carries

storm water sewage flows in excess of the maximum flow which can be effectively treated in the plant, the excess passes over this wier and discharges directly into the river through an overflow sewer.

Coarse Screen:

The first treatment which the sewage receives upon reaching the plant is a screening treatment. A Dorco Bar Screen effects the removal of most of the rags, sticks, and undesirable material which may find its way into the interceptor. This is an automatic screen, which operates whenever there is an appreciable difference in level on the influent and effluent sides of the screen, and is made up of ¼ inch iron bars spaced 1½ inches center to center. The screen was originally furnished with bars spaced ¾ inch center to center, but an undesirable type of screenings was obtained by this close spacing and such foecal matter and other organic matter which should properly be removed in the sedimentation tanks was taken out by the screen. Alternate bars were removed providing a screen with 1¼ inch clear openings which is at the present time producing a satisfactory type of screenings.

Dorr Detritor: (Figure 2.)

After the screening treatment the sewage flows to a Dorr Detritor, 26 feet square and 2½ feet deep when the water in the

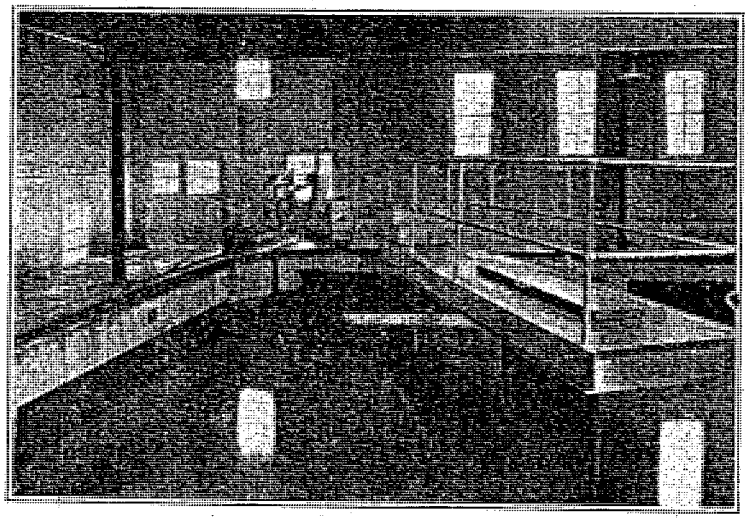

FIGURE 2
The Dorr Detritor in "The Screen House" where the grit is removed.

detritor is level with the effluent wier. The detritor, which serves as a grit chamber, has all of the desirable features of ordinary types of grit chambers and none of their undesirable characteristics. Grit, sand, and other heavy solid materials which reach the

plant in large amounts during storm periods, since the Aurora sewers are of the combined type, are continuously removed and the fresh grit is disposed of immediately. The grit as removed by the detritor is subject to very little decomposition, can be used for fill and does not cause any appreciable odor or nuisance.

Incinerator:

A housing, known as the screen house, (Figure 3) encloses the bar screen and detritor. It is proposed to erect a gas fired

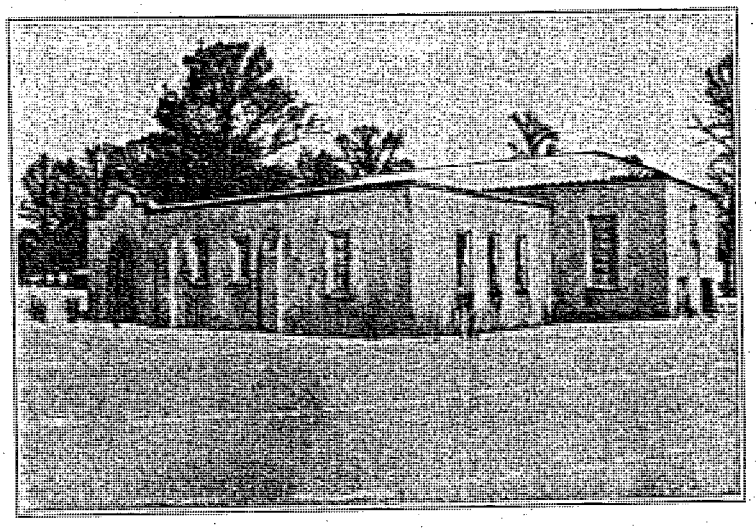

FIGURE 3
"The Screen House" where the sewage is screened and the grit removed.

incinerator in the screen house in which will be burned the screenings from the bar screen, and the grease and oil skimmings from the sedimentation tanks. The grit may also be passed through the incinerator should it at any time contain objectionable amounts of volatile matter. The gas for purposes of incineration will be supplied from that generated in the sludge digestion tanks.

Sedimentation Tanks: (Figure 4.)

The effluent from the detritor flows through a gravity sewer 48 inches in internal diameter, into four sedimentation tanks. A 36 inch venturi meter is located in this line, which meter keeps a continuous record of the sewage flow passing through the plant. These tanks are 50 feet long by 50 feet wide by 12 feet deep, and have a combined displacement of 800,000 gallons, which is equivalent to a three hour detention for the estimated dry weather flow in 1940. Each tank is equipped with a Dorr Traction Type Clarifier which has an attached automatic grease and oil skimming device. A series of overlapping steel blades with spring brass squeegees, scraping the tank bottom and fitted on the four arms

of the traction clarifier, work the newly settled sewage solids to a central sump. This is accomplished by a slow rotary motion of the clarifier arms. The sludge sumps of the sedimentation tanks are connected with piping and valves in such manner that the sludge from any sedimentation tank can be pumped by a single sludge pump to any of three sludge digestion tanks. Approximately two-thirds of the total solids contained in the raw sew-

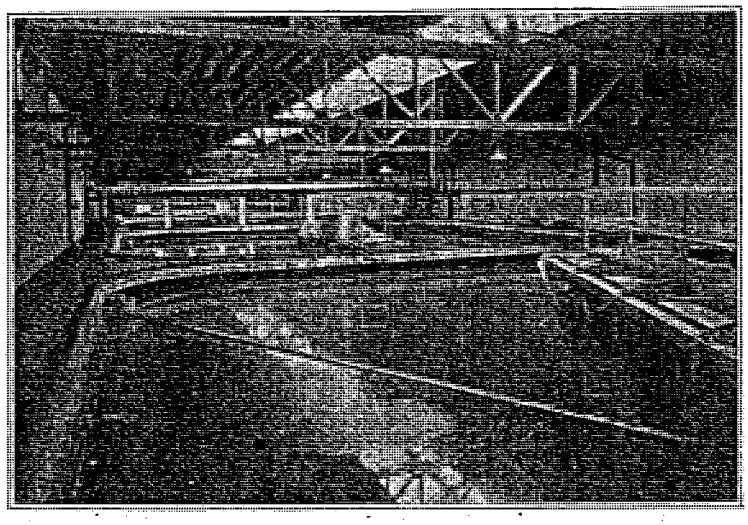

FIGURE 4
The Tank Room showing the four Dorr Traction Clarifiers. The tank in the foreground shows the skimming device in operation. Beyond the right wall are the three sludge digestion tanks and the housing for the machinery used in this connection.

age are removed in the sedimentation tanks. The other one-third of the sewage solids are so finely divided that they will not settle, and are carried out with the tank effluent for further treatment in the trickling filter beds.

The settled sewage from the sedimentation tanks flows into an effluent channel which at its center connects with the suction well of the pump house and at its northerly end connects with an overflow and by-pass chamber. This arrangement permits the clarified sewage to be either pumped to the trickling filters for secondary treatment, or by-passed directly to the river.

Each skimming device brings the grease, oil, and scum periodically upon a grease table, and an automatic device provides for the escape of the contents of the grease table into a grease collecting well. The contents of the grease well can be pumped to a collecting tank in the Screen House for incineration or disposal.

The four sedimentation tanks are completely covered with a housing fitted with sky lights and ventilators. This protection has been found to be very desirable for the operation of the tanks and equipment during the winter months.

Separate Sludge Digestion Tanks:

The three separate sludge digestion tanks are each 50 feet by 50 feet in plan and of an average depth of 17 feet. Each tank is covered with a concrete roof with gas collecting dome, supported by a steel truss which also carries a Dorr agitator and scum breaking mechanism. The sludge digestion tanks provide a capacity of two cubic feet per capita based on the estimated 1940 population of 67,000. A hot water heating coil composed of four lines of 1¼ inch pipe is attached to the interior walls of each tank and located approximately six feet above the tank bottom. Brown recording thermometers are provided to keep an accurate record of the sludge temperature in each of the three digestion tanks. An overflow and 6-inch return pipe permits excess water pumped into the digestion tanks to return to the influent channel of one of the sedimentation tanks. Each tank is also provided with a 6 inch scum pipe line and an 8 inch sludge blow off line having outlets on the sludge drying beds.

The mechanical agitator maintains a uniform bacterial action in the sludge during the process of decomposition. The hot water heating coils are supplied with hot water from a gas fired boiler which is heated with the gas generated in the sludge digestion

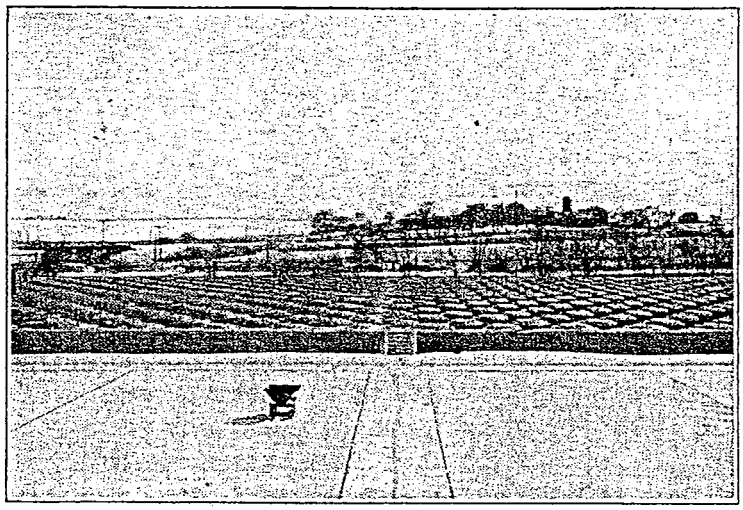

FIGURE 5
Sludge drying beds in the foreground, trickling filter beds under typical winter conditions in the center.

tanks by the process of sludge decomposition. Heating the sludge greatly accelerates the bacterial action in the tanks and shortens the time required for complete ripening or digestion of the sludge. With provisions for sludge heating a uniform temperature and bacterial action can be maintained at all times of the year, and tanks can be of reduced size and cost.

Gas production in the sludge digestion tanks has been at the

rate of 35,000 cubic feet daily, or at the rate of approximately one cubic foot per capita contributing. During the past winter this quantity has been far in excess of the amount needed for heating all of the plant buildings and sludge tanks. At the present time the excess gas is wasted.

The ripened, or digested, sludge from the tanks is discharged by gravity onto the sludge drying beds, where the excess water is drained out of it, leaving an inoffensive residue which can be easily handled and removed with shovels.

Sludge Drying Beds: (Figure 5.)

The sludge drying beds, with over all dimensions of 125 feet by 410 feet, consist of ten units 125 feet long and 40 feet wide, with a ten foot crushed stone walk through the center. Each unit has a six inch vitrified tile under-drain through its longitudinal center. Above the under-drain is a layer of bank run gravel ten inches in depth, which is surfaced with a layer of sand two inches in depth. Each unit is served with a spur from an industrial track system for use in removing the dried sludge. The sludge drying beds provide an area of ¾ square foot per capita based on the 1940 population.

Trickling Filters: (Figure 6.)

The trickling filters, enclosed by four concrete walls, have over all dimensions of 586 feet in length by 273 feet in width,

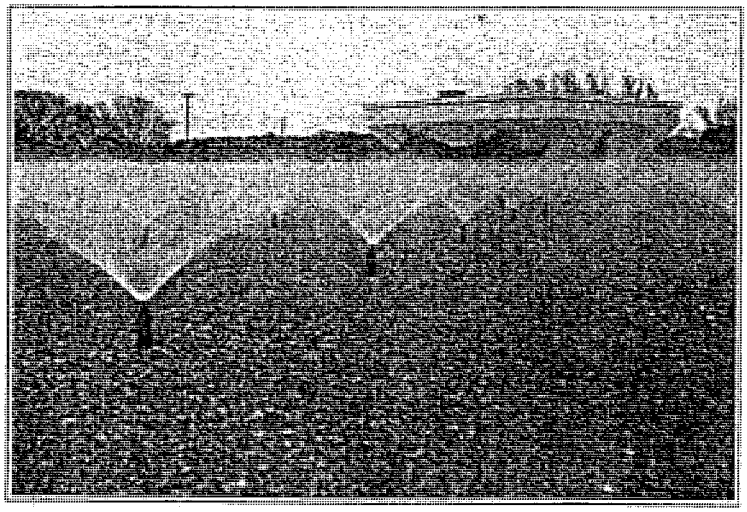

FIGURE 6
Trickling Filter Beds in operation.

with an average depth of stone of six feet. The underdrainage system consists of a concrete base slab 4 inches in depth upon which is laid vitrified clay "Metro" block forming parallel lines of drain channels 13½ inches center to center. These drainage

channels discharge into an outlet channel paralleling the east filter wall through which the filter effluent is discharged directly into the river.

Perforated vitrified clay blocks resting on top of the channel blocks prevent the filter stone from filling the channels. This construction permits the filtered sewage to freely enter the channels and facilitates the aeration of the stone beds through the drainage system.

Located at the center of each half of the filter bed area is a two compartment dosing tank. Each compartment is fitted with a Miller automatic sewage siphon of 24 inches diameter, which discharges the contents of the compartment through a system of cast iron piping fitted with riser pipes and spray nozzles over one quarter of the filter bed area. Sewage is supplied to the dosing tanks through a cast iron influent line of 30 inches internal diameter connected with the three sewage pumps located in the pump house.

The filter material is of crushed limestone of such size that it will pass a 12 inch screen and be retained on a 1½ inch screen. Because of the large investment in the 36,000 cubic yards of stone contained in the filter, especial care was used to obtain a stone which would resist disintegration under the conditions of filter bed service. Samples were secured from all available quarries, which were tested by alternate freezing and thawing when submerged in water, this process being repeated one hundred times. Of the samples tested, three were found to meet this test satisfactorily, and the Contractor was permitted to choose from these supplies.

In operation, a gelatinous film of living organisms is found covering the stone throughout the bed. This film, which consists of a mass of bacteria, fungi, insect larvae and other small life, is a highly complex community of plant and animal life. In the filter beds the activities peculiar to this type of sewage treatment take place. The odors characteristic of the settld sewage applied to the bed are eliminated, and the finely divided organic solids are oxidized, and the dissolved nitrogen compounds are converted to nitrates and nitrites. The efficiency of the process of sedimentation and filteration is such that the biochemical oxygen demand of the raw sewage is reduced 85 per cent, and a stable and non-putresible effluent is obtained for discharge into the river.

The filter beds were designed on the basis of three thousand people per acre foot of filter material, using the estimated 1940 population as a basis for this computation.

The main building of the treatment plant houses the pumping equipment which consists of three horizontal high efficiency centrifugal pumps direct connected to 440 volt, three phase,

slip ring, induction motors, with complete automatic motor control and switch board equipment. One unit has a capacity of 6 million gallons per day while that of each of the other two units is 8 million gallons per day. On the first floor of this building are located offices, wash rooms, locker rooms, and a spacious laboratory, while in the basement are located the boiler room, scum and grease pump, and a garage.

The laboratory is fully equipped for making all tests and analyses necessary in determining the operating efficiency of each unit of the treatment plant. This equipment will not only permit a careful control of all treatment processes, but also provide a means for conducting research study of sewage treatment problems.

FIGURE 7
General view of The Treatment Works at Aurora, Illinois.

The total contract cost to the Aurora Sanitary District, of the completed work is the sum of $1,215,600.00, of which $604,000.00 represents the cost of the intercepting sewers, and $611,600.00 the cost of the treatment plant.

The Spanish type of architecture is used throughout in the construction of the plant buildings, presenting a very attractive appearance when viewed from the main highway. (Figure 7.) Complete plans are now being prepared for landscaping the entire 26 acres owned by the District. Upon the completion of the work outlined in these plans, the grounds will present the attractive appearance of a natural park.

MEETING AGENDA

CAC Meeting No. 2
May 27, 2009
11:00 a.m. to 1:00 p.m.

Introductions	11:00 a.m.
Review Meeting Minutes – CAC Meeting No. 1 Handouts for CAC Meeting No. 2	
Presentation	11:15 a.m.
Topic: Wastewater Treatment Plant Characterization (Plant Tour)	
Lunch and Open Discussions	12:30 p.m.
Adjournment	1:00 p.m.

MEETING MINUTES

CAC Meeting No. 1
April 29, 2009 at 11:00 a.m.

Purpose: Meeting No. 1 served to introduce the CAC members and support staff, discuss the requirements of the LTCP, provide the general purpose of the committee, and present a brief history of the combined sewer system.

Attendees:

CAC Members	
Darryl Devick	City of Aurora
Judith Sotir	Fox Metro WRD
Tim Pollowy	Fox River Ecosystem Partnership
Bill Donnell	Fox Valley Park District
Fran Caffee	Sierra Club, Valley of the Fox Group
Joe Wywrot	United City of Yorkville
Michael Pubentz	Village of Montgomery
Michael Glock	Village of North Aurora
Jerry Weaver	Village of Oswego
Brad Merkel	Village of Sugar Grove
CAC Support Staff	
Tom Muth	Fox Metro WRD
Jeff Humm	Fox Metro WRD
Roy Harsch	Drinker Biddle & Reath
Philippe Moreau	Walter E. Deuchler Associates, Inc.
John Frerich	Walter E. Deuchler Associates, Inc.

Distribution: above

Discussion Items:

1. Tom Muth introduced and welcomed the CAC members. The committee is comprised of a member of the District's Board of Trustees, representatives from each of the municipalities served by the District, the largest park district within the District's service area and two of the largest and most active environmental groups within the Fox River watershed. He briefly explained the purpose of the committee and thanked everyone for taking time out of their busy schedules to participate in this process.

   Binders were handed out to each member that included: the contact information for each CAC member and support staff; a tentative meeting schedule, agenda for Meeting No. 1, PowerPoint presentation for Meeting No. 1 and a copy of "A Short History of the Aurora Sanitary District and a Brief Description of its Treatment Plant" by Walter E. Deuchler (1929-30). These binders are intended to be brought to each meeting for inclusion of ensuing handouts.

2. John Frerich gave a PowerPoint presentation regarding the "Background and History of the Combined Sewer System" within the Fox Metro WRD. The general points of discussion were:

   a. General background of combined sewer overflows (CSOs) and the Long Term Control Plan (LTCP)
      i. Basic definitions
      ii. Regulatory requirements
      iii. Role and responsibility of the CAC

   b. History of the Fox Metro Water Reclamation District, the combined sewer system (CSS) and combined sewer overflow (CSO)
      i. Initial construction of the combined sewer system, treatment facility and original intercepting sewers
      ii. Historical improvements to the treatment plant and combined sewer system

3. An open discussion ensued upon conclusion of the presentation. Some of the key points of discussion included the following:

   a. The City of Aurora is the only municipality within the District's service area that owns, operates and maintains a combined sewer system within its municipal boundaries. The City of Aurora has 15 permitted CSOs within their combined sewer system and is required to develop their own LTCP to address these overflows.

   b. The District owns, operates and maintains the original 69-inch interceptor along the Fox River to which Aurora's combined sewer system is tributary. Other separated sewer systems from North Aurora, Aurora and Montgomery are also tributary to this interceptor.

c. The District has one permitted CSO at the headworks of its treatment facility.

d. The focus of the CAC will be solely on the District's permitted CSO outfall.

e. The tentative meeting schedule, as presented, was acceptable to the CAC members.

Next CAC Meeting: The next meeting is scheduled for Wednesday, May 27, 2009 at 11:00 a.m. at the Fox Metro Water Reclamation District W.J. "Ben" Baines Memorial Administration Building located at 682 State Route 31, Oswego, IL

The above constitutes our understanding of the information discussed and the decisions reached. Any corrections or clarifications should be directed in writing to the attention of the author.

Prepared by: John W. Frerich, P.E.

FOX METRO WATER RECLAMATION DISTRICT

WALTER E. DEUCHLER ASSOCIATES, INC.
Consulting Engineers — Aurora, Illinois

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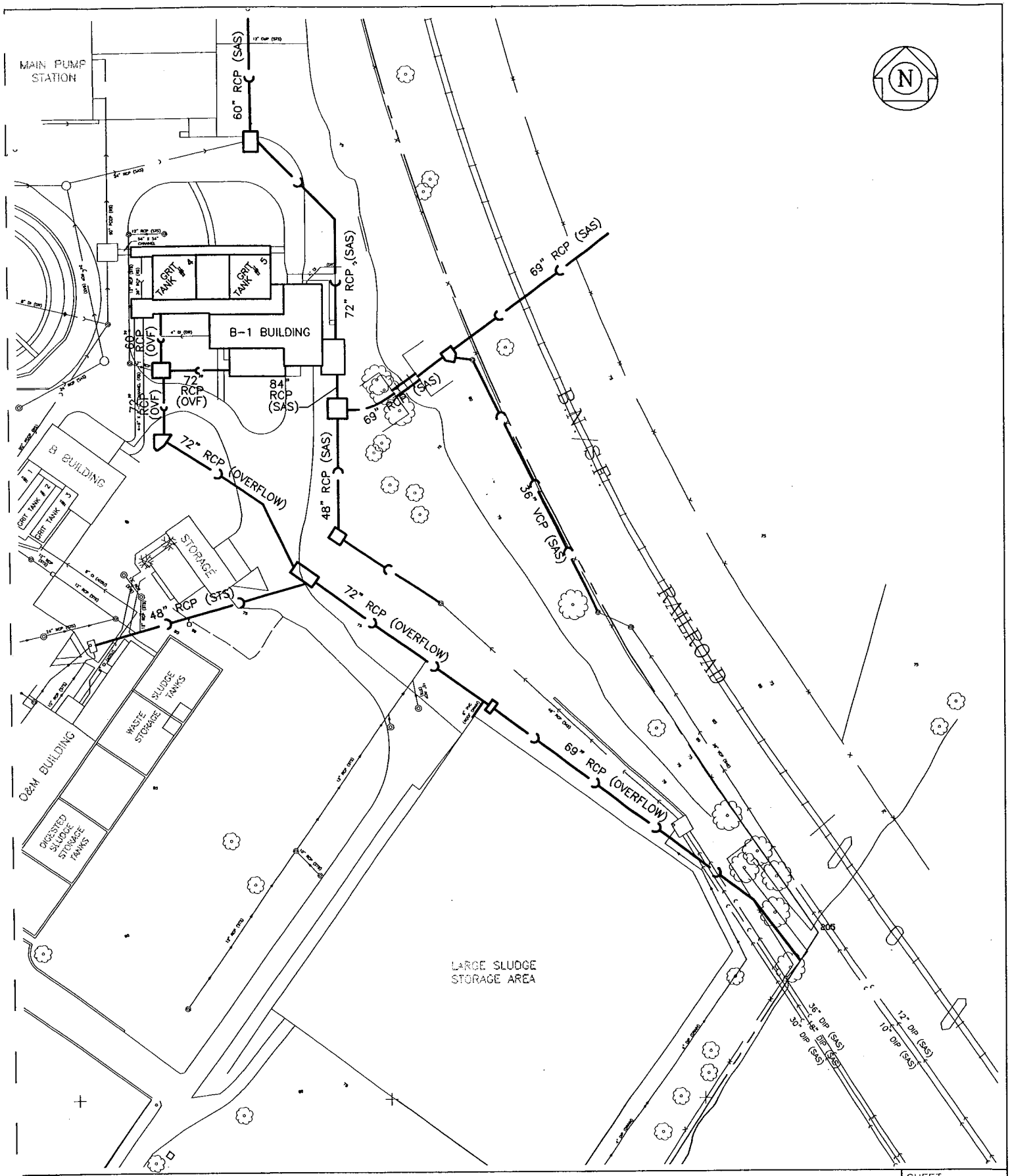
FOX METRO WATER RECLAMATION DISTRICT
LOCATION PLAN



WALTER E. DEUCHLER ASSOCIATES, INC.

Consulting Engineers — Aurora, Illinois

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SHEET	1
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REVISIONS
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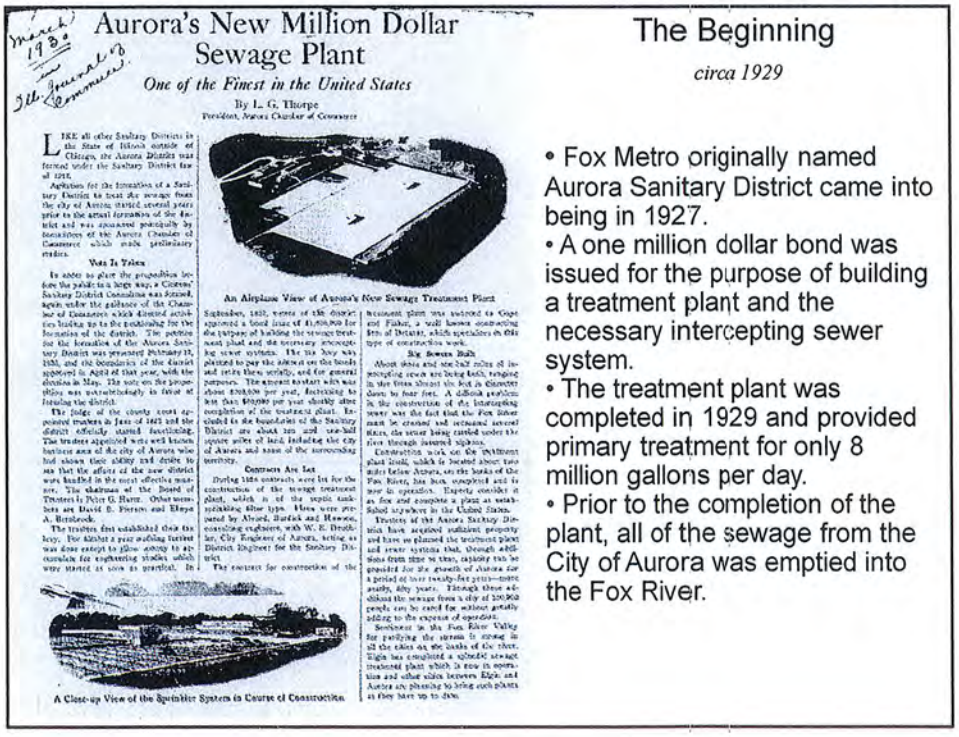
INFLUENT SEWERS AND OVERFLOW

FOX METRO WATER RECLAMATION DISTRICT



March 1930
Ill. Journal of Commerce

Aurora's New Million Dollar Sewage Plant

One of the Finest in the United States

By L. G. Thorpe
President, Aurora Chamber of Commerce

LIKE all other Sanitary Districts in the State of Illinois outside of Chicago, the Aurora District was formed under the Sanitary District law of 1917.

Agitation for the formation of a Sanitary District to treat the sewage from the city of Aurora started several years prior to the actual formation of the district and was sponsored principally by members of the Aurora Chamber of Commerce which made preliminary studies.

Vote Is Taken

In order to place the proposition before the public in a large way, a Citizens' Sanitary District Committee was formed, again under the guidance of the Chamber of Commerce which directed activities looking up to the petitioning for the formation of the district. The petition for the formation of the Aurora Sanitary District was presented February 17, 1930, and the boundaries of the district appeared in April of that year, with the election in May. The vote on the proposition was overwhelmingly in favor of forming the district.

The judge of the county court appointed trustees in June of 1927 and the district officially started functioning. The trustees appointed were well known business men of the city of Aurora who had shown their ability and desire to see that the affairs of the new district were handled in the most effective manner. The chairman of the Board of Trustees is Peter G. Hartz. Other members are David B. Pierson and Elwyn A. Brodstock.

The trustees first established their tax levy. For almost a year nothing further was done except to follow among to accumulate for engineering studies which were started as soon as practical. In September, 1928, voters of the district approved a bond issue of $1,000,000 for the purpose of building the sewage treatment plant and the necessary intercepting sewer systems. The tax levy was planned to pay the interest on the bonds and retire them serially, and for general purposes. The amount to start with was about $100,000 per year, increasing to not less $50,000 per year shortly after completion of the treatment plant. Included in the boundaries of the Sanitary District are about ten and one-half square miles of land, including the city of Aurora and some of the surrounding territory.

Contracts Are Let

During 1929 contracts were let for the construction of the sewage treatment plant, which is of the septic tank-trickling filter type. Plans were prepared by Alvord, Burdick and Howson, consulting engineers, with W. E. Brotherton, City Engineer of Aurora, acting as District Engineer for the Sanitary District.

The contract for construction of the treatment plant was awarded to Gust and Fisher, a well known contracting firm of Detroit, which specializes on this type of construction work.

Big Sewers Built

About thirty and one half miles of intercepting sewer are being built, ranging in size from almost six feet in diameter down to four feet. A difficult problem in the construction of the intercepting sewer was the fact that the Fox River must be crossed and recrossed several times, the sewer being carried under the river through inverted siphons.

Construction work on the treatment plant itself, which is located about two miles below Aurora, on the banks of the Fox River, has been completed and is now in operation. Experts consider it as fine and complete a plant as established anywhere in the United States.

Trustees of the Aurora Sanitary District have acquired sufficient property and have so planned the treatment plant and sewer systems that, through additions from time to time, capacity can be provided for the growth of Aurora for a period of four twenty-five years—more nearly, fifty years. Through these additions the sewage from a city of 200,000 people can be cared for without greatly adding to the expense of operation.

Sentiment in the Fox River Valley for purifying the stream is strong in all the cities on the banks of the river. Elgin has completed a splendid sewage treatment plant which is now in operation and other cities between Elgin and Aurora are planning to bring such plants as they have up to date.

An Airplane View of Aurora's New Sewage Treatment Plant

A Close-up View of the Sprinkler System in Course of Construction

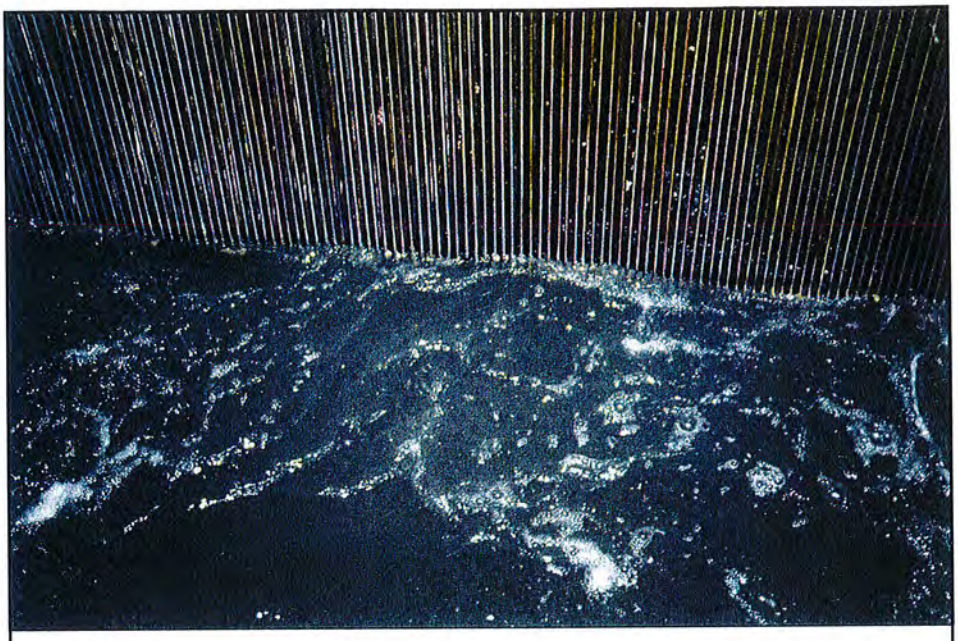
The Beginning

circa 1929

- Fox Metro originally named Aurora Sanitary District came into being in 1927.
- A one million dollar bond was issued for the purpose of building a treatment plant and the necessary intercepting sewer system.
- The treatment plant was completed in 1929 and provided primary treatment for only 8 million gallons per day.
- Prior to the completion of the plant, all of the sewage from the City of Aurora was emptied into the Fox River.

Primary Treatment

It all starts here. Raw Sewage

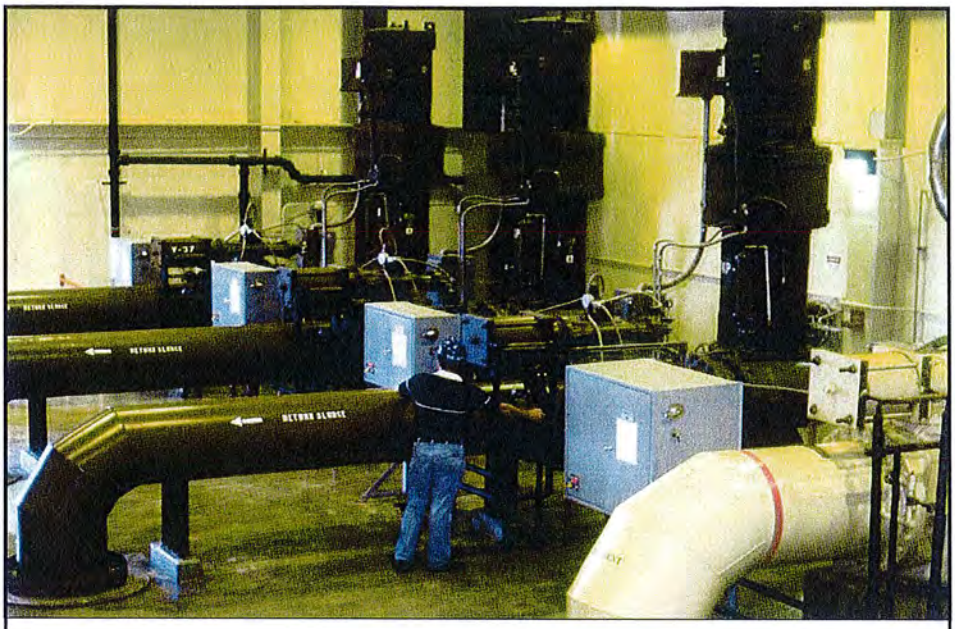


BAR SCREENS **remove things that could damage pumps.**

Small Scale High Efficiency Bar Screen

AERATED GRIT CHAMBERS **remove sand and gravel.**

MAIN PUMP STATION, **the brains of the treatment plant.**

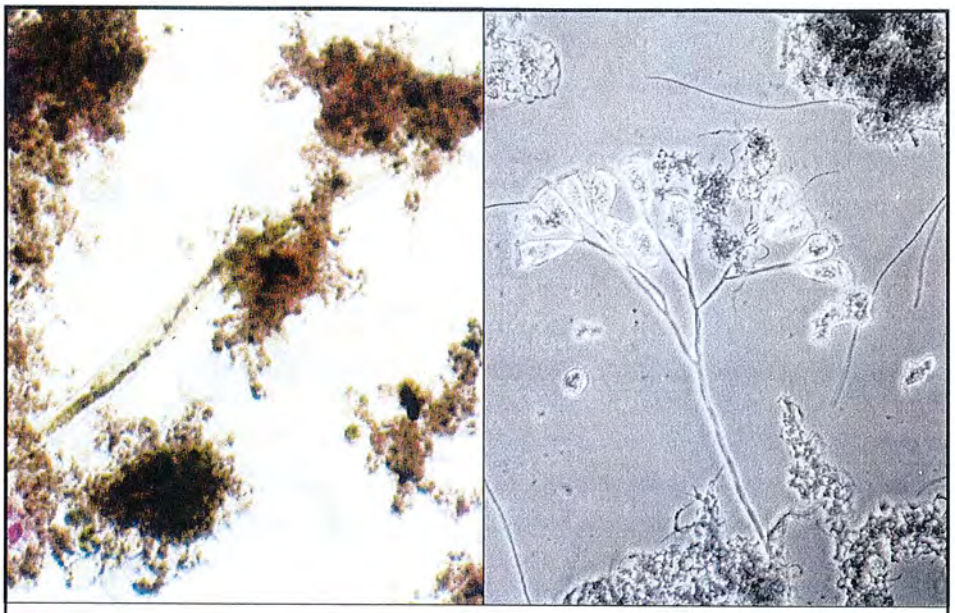


PUMPS, **the heart of the wastewater treatment plant.**

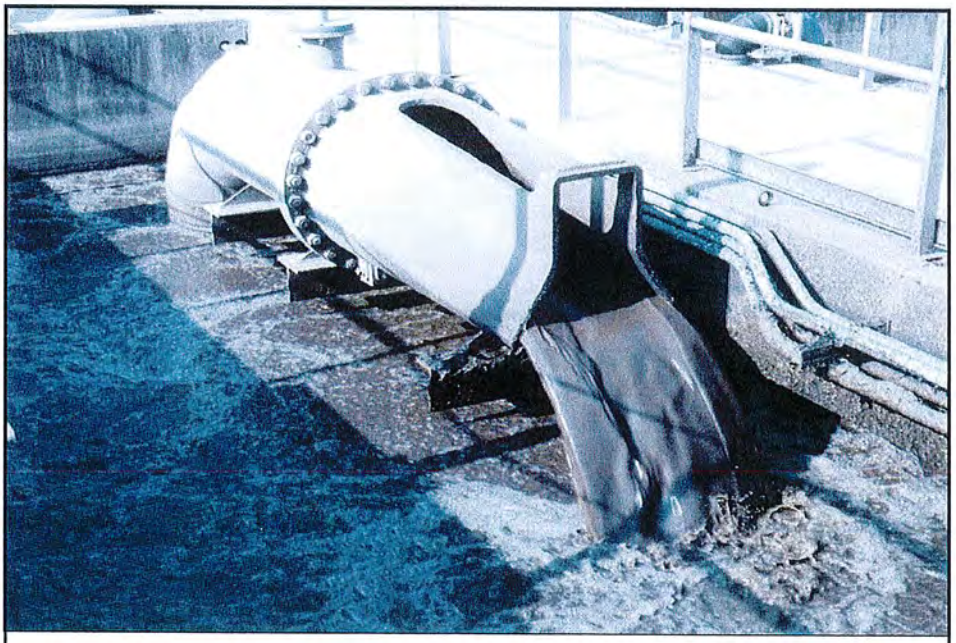
PRIMARY CLARIFIERS **settle out some of the organic matter.**

An empty *PRIMARY CLARIFIER.*

***AERATION TANKS*, where most of the cleaning is done.**

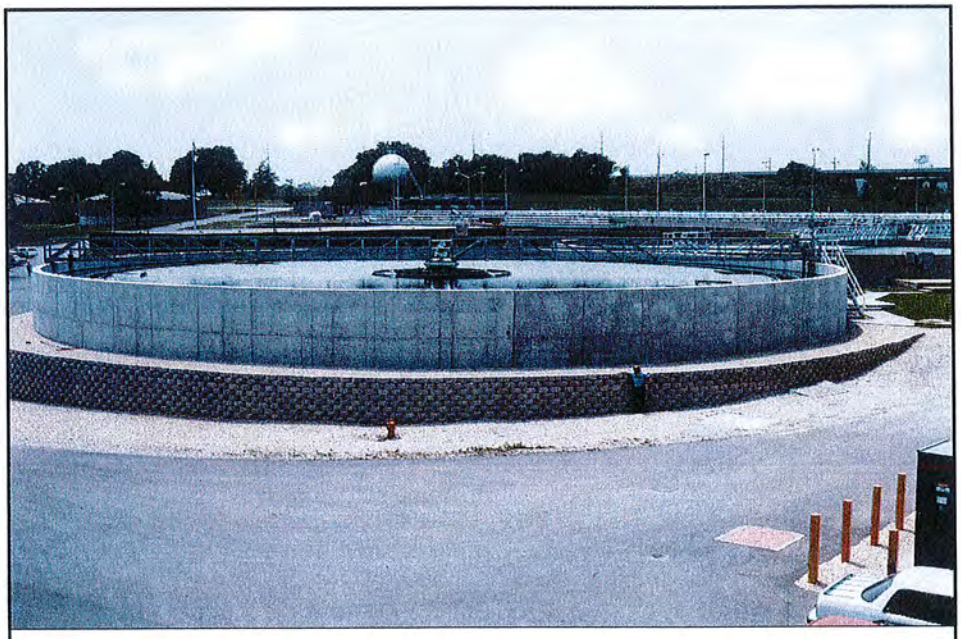


Microscopic looks at of some of *"the bugs"*.



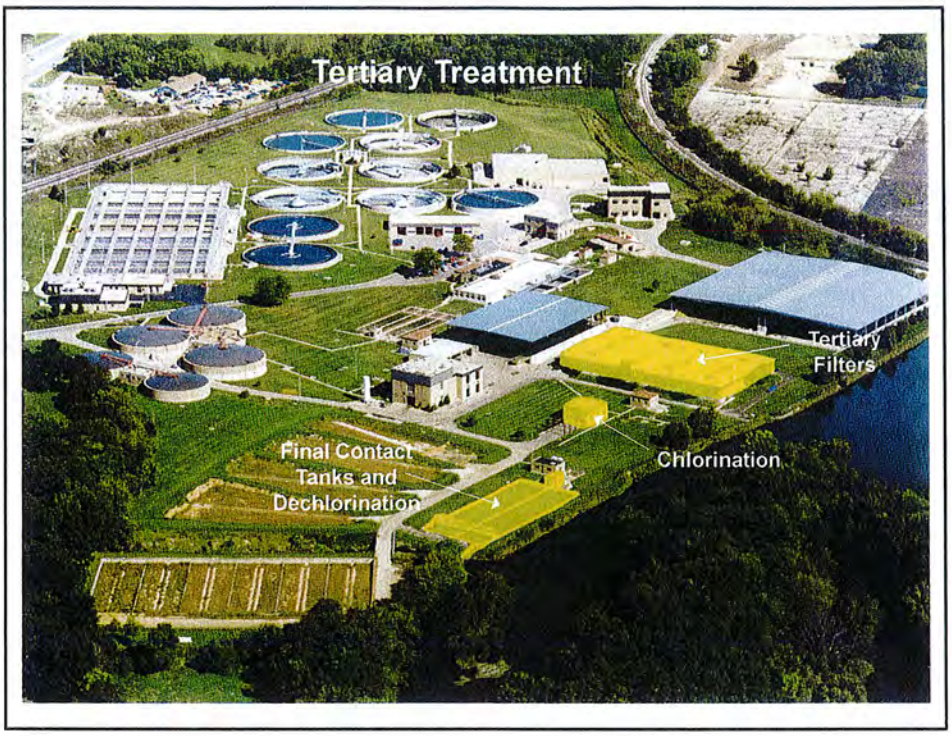
Adding *"the bugs"*.

An empty aeration tank with *FINE BUBBLE DIFFUSERS.*



SECONDARY CLARIFIERS are used to remove "the bugs".

Empty secondary clarifier with *"bug vacuum cleaner"*.

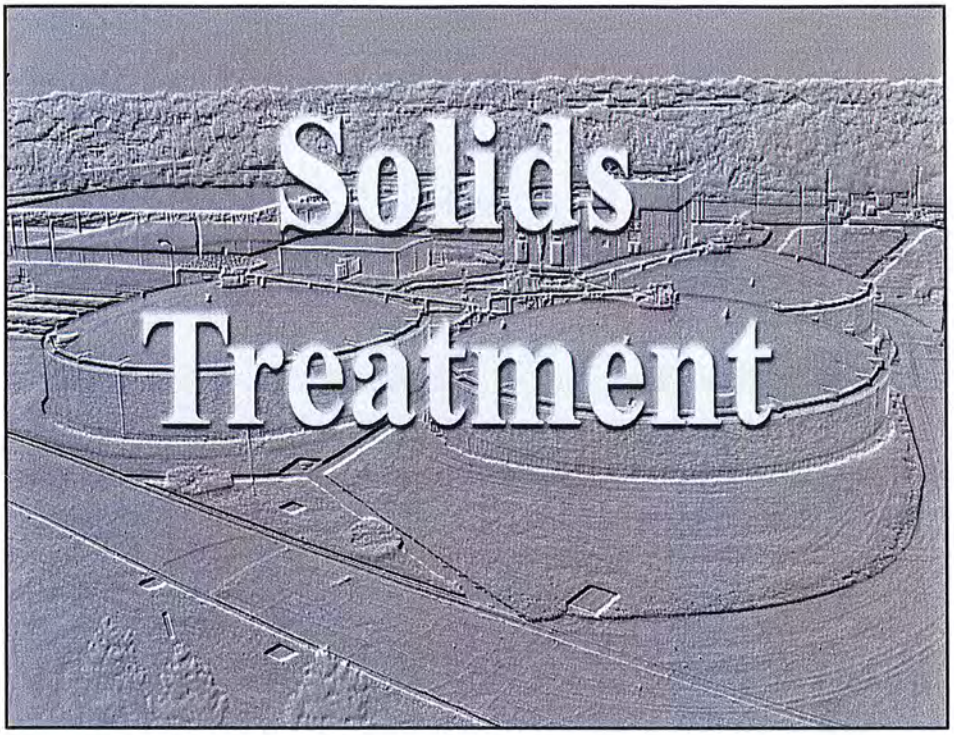


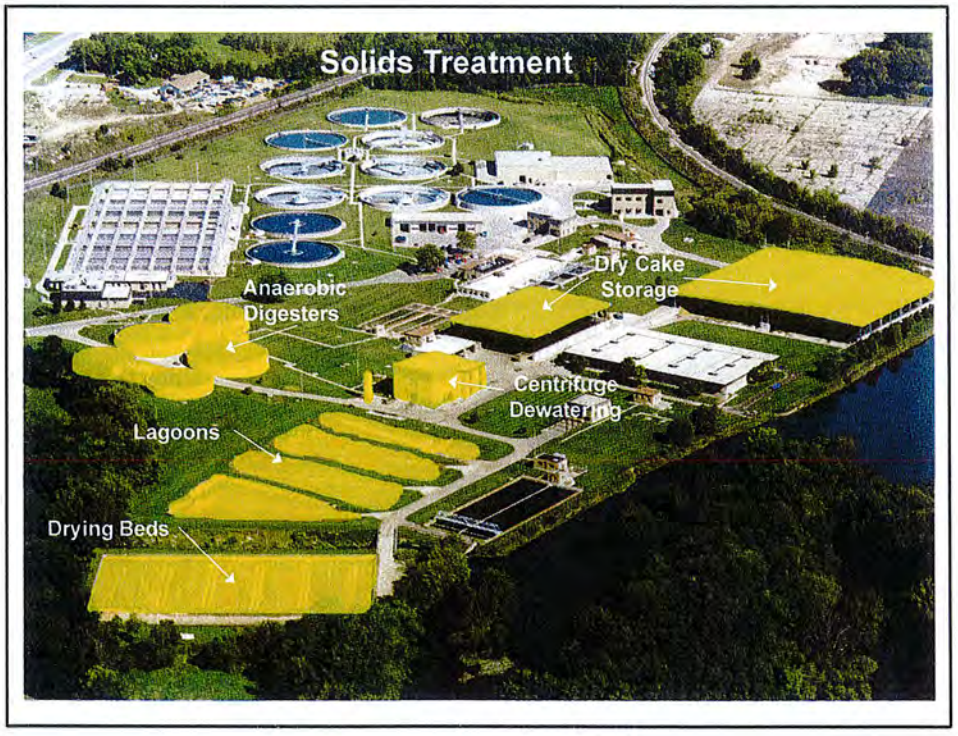
TERTIARY RAPID SAND FILTERS

filter out any escaping particles of activated biosolids.

DISINFECTION TANKS **help to sanitize the water.**

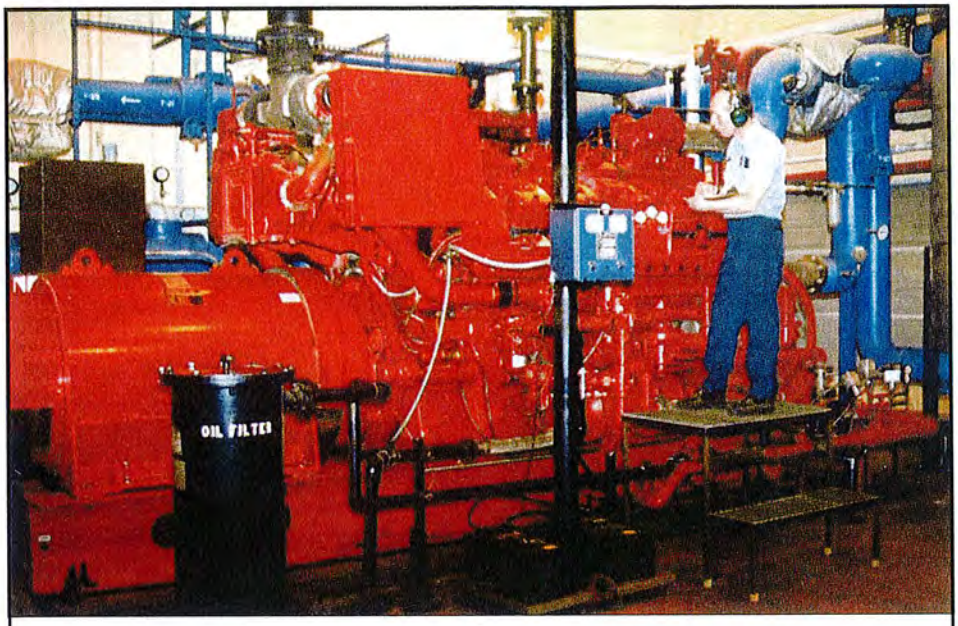
SPARKLING WATER **being returned to the Fox River.**


Solids
Treatment


Solids Treatment
Anaerobic Digesters
Dry Cake Storage
Centrifuge Dewatering
Lagoons
Drying Beds

ANEROBIC DIGESTERS **decompose organic matter.**

The methane gas produced is stored in a *GAS SPHERE*.



ENGINES **burn the methane gas to make electricity.**

CENTRIFUGES **are used to "spin dry" the** ***BIOSOLIDS.***

BIOSOLIDS **are stored under a roof to keep them dry.**

Trucks are used to haul the biosolids to farm fields.

A manure spreader is used spread the biosolids.

HAPPY FARMER **with his biosolids fertilized corn crop.**

MEETING AGENDA

CAC Meeting No. 3
June 24, 2009
11:00 a.m. to 1:00 p.m.

Introductions	11:00 a.m.
Review Meeting Minutes – CAC Meeting No. 2 Handouts for CAC Meeting No. 3	
Presentation (John Frerich)	11:15 a.m.
Topic: Current Facility Planning Efforts	
Lunch and Open Discussions	12:30 p.m.
Adjournment	1:00 p.m.

MEETING MINUTES

CAC Meeting No. 2
May 27, 2009 at 11:00 a.m.

Purpose: Meeting No. 2 served to provide the members with an understanding of the daily operations and processes of the existing wastewater treatment plant facilities of the Fox Metro Water Reclamation District.

Attendees:

CAC Members	
Darryl Devick	City of Aurora
Judith Sotir	Fox Metro WRD
Tim Pollowy	Fox River Ecosystem Partnership
Bill Donnell	Fox Valley Park District
Joe Wywrot	United City of Yorkville
Michael Pubentz	Village of Montgomery
Michael Glock	Village of North Aurora
Jerry Weaver	Village of Oswego
Brad Merkel	Village of Sugar Grove
CAC Support Staff	
Tom Muth	Fox Metro WRD
Jeff Humm	Fox Metro WRD
Roy Harsch	Drinker Biddle & Reath
Philippe Moreau	Walter E. Deuchler Associates, Inc.
John Frerich	Walter E. Deuchler Associates, Inc.
Other Guests	
Jackie Dearborn	United City of Yorkville
Tim Morrall	Fox Metro WRD

Jackie Dearborn from the United City of Yorkville will serve as an alternate for Joe Wywrot in his absence at future meetings.

Distribution: The above attendees and the following:

CAC Members	
Fran Caffee	Sierra Club, Valley of the Fox Group
Other Guests	
Jay Patel	Illinois EPA

Discussion Items:

1. John Frerich welcomed everyone. The following information was handed out to each member to include in their binders: meeting minutes for Meeting No. 1, meeting agenda for Meeting No. 2, a colored 8½"x11" exhibit titled "Location Plan" highlighting the various treatment plant processes, an 8½"x11" exhibit titled "Influent Sewers and Overflow" delineating the sizes and locations of the various influent sewers and CSO overflow at the headworks of the wastewater treatment plant, and a PowerPoint presentation handout titled "Giving Water a Second Chance", which is a digital tour of the wastewater treatment plant that the District provides for scheduled group tours that occur on rainy days. The handouts are intended to provide the committee members with a visual reference for what they will see on the plant tour.

2. Tom Muth introduced Tim Morrall, Operations Supervisor for the District's wastewater treatment plant. Tim served as the plant tour guide and provided some basic information regarding the wastewater treatment plant capacity and operations prior to beginning the tour. Hard hats and safety glasses were handed out to those that did not have their own.

3. The tour was conducted with the committee members seeing the following processes:

   a. Headworks: Junction box where the flows from the various interceptors meet prior to entering the plant
   b. Building B-1: Bar screen, grit removal process and CSO overflow weir
   c. Building K-1: Main pumping station
   d. Primary/Secondary Clarifiers: systems that further settle out solids from the flows
   e. Activated Sludge System: aeration tanks where a biological process (microscopic "bugs") is used to further digest the solids in the wastewater.
   f. Blower Building: provides the air to the aeration tanks
   g. Co-Generation System: generators that use methane gas byproduct to produce electricity for use by other processes at the plant
   h. Chlorination/Dechlorination System: used to clean and disinfect the effluent prior to discharge
   i. Treatment plant outfall: discharge of treated effluent into the Fox River

   Unfortunately, the tertiary filtration and anaerobic digestion systems were not available for viewing due to current construction activity. Also, the CSO Outfall was not visible due to

recent rains and current high river elevations submerging the outfall.

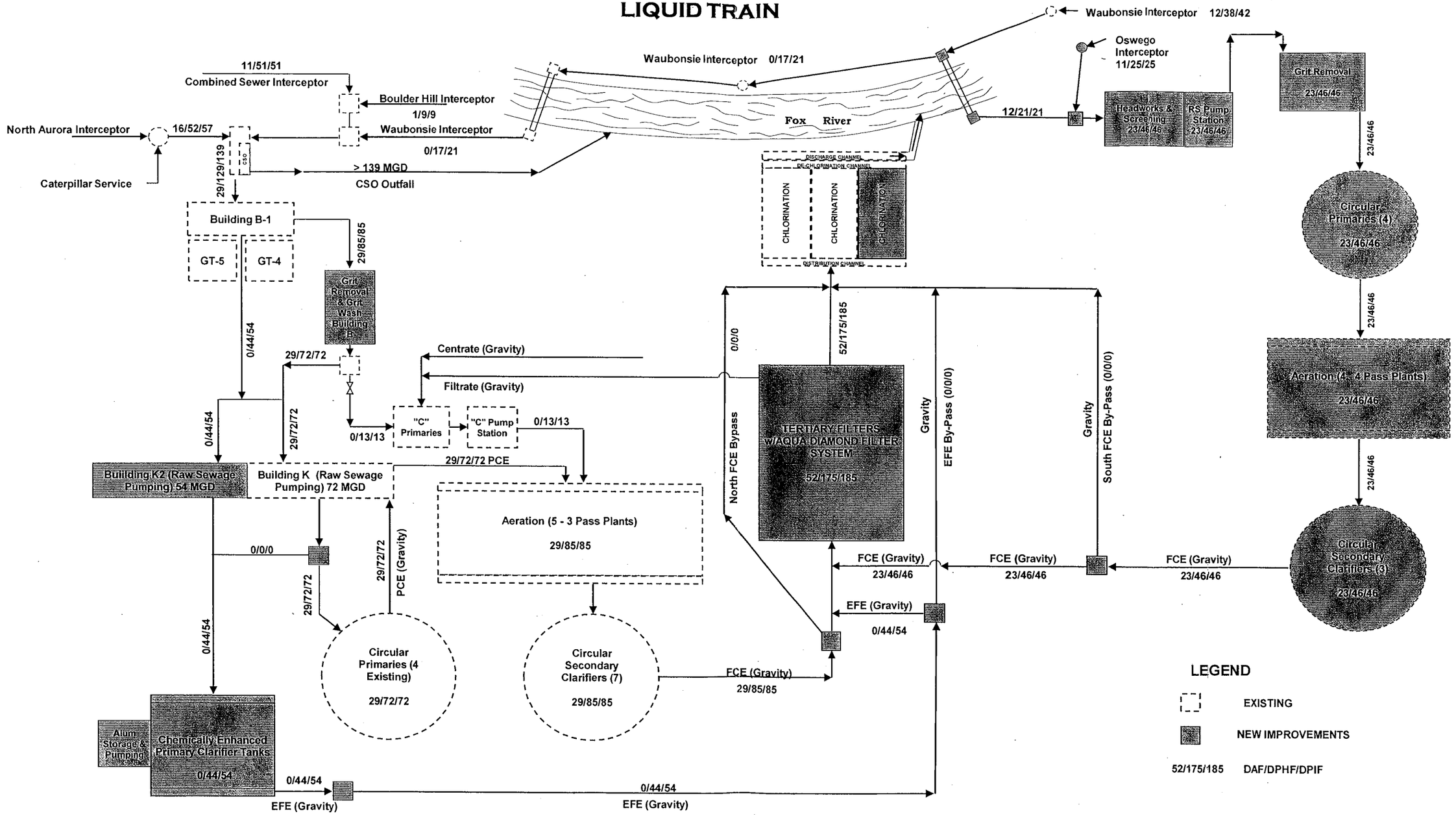
Next CAC Meeting: The next meeting is scheduled for Wednesday, June 24, 2009 at 11:00 a.m. at the Fox Metro Water Reclamation District W.J. "Ben" Baines Memorial Administration Building located at 682 State Route 31, Oswego, IL

The above constitutes our understanding of the information discussed and the decisions reached. Any corrections or clarifications should be directed in writing to the attention of the author.

Prepared by: John W. Frerich, P.E.

2025 PROPOSED PLANT IMPROVEMENTS

LIQUID TRAIN



WALTER E. DEUCHLER ASSOCIATES, INC. *Consulting Engineers - Aurora, Illinois*	DATE 6/15/2009	DESIGNED GSL	DRAWN GSL	APPROVED	BOOK	SCALE None	CAD DWG.	JOB NO. 111-06060-00	FMWRD - LONG TERM CONTROL PLAN 2025 PROPOSED PLANT IMPROVEMENTS	File Path G:/ 111-06060-00 / 2025 Plant Improvements	SHEET 1 OF 1

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POINTS OF DISCUSSION

1) Purpose of Master Plan
2) Discussion of selected Liquid and Solid Train Options
3) Implementation of Master Plan
4) Questions

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PURPOSE OF MASTER PLANNING EFFORT

The Master Planning Effort was undertaken to develop a phased approach for Capital Improvements to meet increased demands, while considering financial constraints and impending regulations.

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CONSIDERATIONS

1) As frequency of peak flows > 85 mgd (131 cfs) increase, bypassing to the Fox River may occur more frequently
2) Address continuing growth in the FPA
3) Address I&I in the wastewater collection system
4) Phosphorous removal will likely be required when expanding the facilities
5) Biosolids storage and disposal will continue to be a concern for the District
6) Phasing of the project is important to all parties, the District, the constituents, and the IEPA SRLF program

COMPONENTS OF MASTER PLAN

1) Evaluation of existing conditions (2005)
   a. In the collection system
   b. At the treatment plant
      i. Hydraulic loadings
      ii. Process loadings – liquid flow
      iii. Process loadings – biosolids
2) Projection of future conditions (2025)
   a. Growth in the FPA
   b. Hydraulic loadings
   c. Organic loadings

COMPONENTS OF MASTER PLAN

3) Evaluation of systems at the wastewater treatment plant
   a. Treatment of overall increase in flows and, in particular, peak flows
   b. Evaluation of processes that are adaptable to phosphorus removal
   c. Evaluation of improved methods to handle biosolids
4) Development of a cost effective phased approach
5) Development of an implementation plan schedule for completion of the phases

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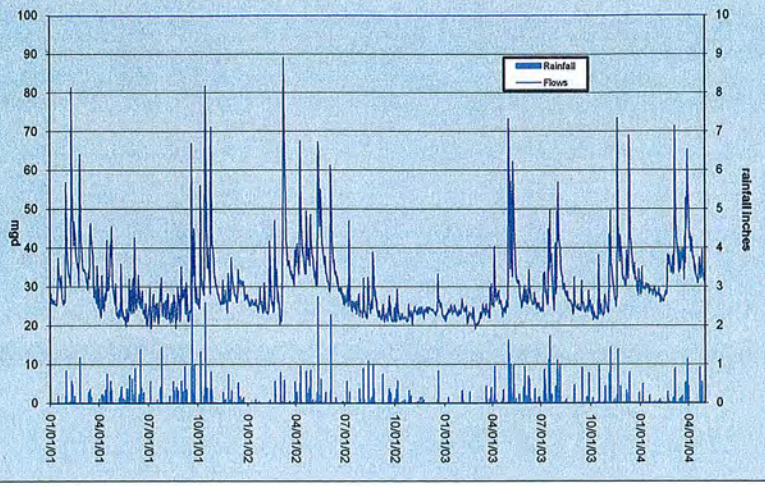
EXISTING CONDITIONS

EXISTING WWTP DAILY FLOWS



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EXISTING CONDITIONS

Summary of May 12, 2002 Flows in Interceptors (Scaled to 5-Year Storm)

	COMB.	NORTH AURORA	WAUBONSIE	BOULDER HILL	OSWEGO	CAT	TOTALS
LOWEST FLOW DAY	5.36	6.61	5.74	0.66	0.60	0.13	**19.10**
DAF (LGWT) - Base Flow	8.20	8.01	6.95	1.01	0.65	0.43	**25.25**
AVERAGE DAILY FLOW	11.02	10.18	8.20	1.32	0.90	0.50	**32.12**
DAF (HGWT)	31.14	17.91	12.96	2.28	1.32	0.55	**66.16**
PEAK HOURLY FLOW	50.53	60.24	43.33	12.63	5.10	2.20	**174.03**
PEAK INSTANTANEOUS FLOW	54.20	65.82	47.52	13.10	5.29	2.33	**188.26**
Determination of Flow - Before Inflow Removal							
FLOW MEASURED BEFORE STORM EVENT	8.80	11.39	10.38	1.55	1.63	0.68	**34.43**
FLOW MEASURED AFTER STORM EVENT	31.74	21.29	16.39	3.29	2.17	0.13	**75.01**
INFILTRATION	22.94	9.90	6.01	1.74	0.54	0.00	**41.13**
PEAK HOURLY FLOW (Un-Scaled)	50.53	46.68	34.69	7.70	3.02	0.68	**143.30**
INFLOW (Un-scaled)	21.72	21.40	14.80	5.13	1.45	0.28	**64.78**
INFLOW (Scaled)	21.72	36.95	26.94	9.34	2.93	0.50	**100.37**
PEAK HOURLY FLOW (Scaled)	**50.53**	**60.24**	**43.33**	**12.63**	**5.10**	**2.20**	**174.03**
PEAK INSTANTANEOUS FLOW (Scaled)	**54.20**	**65.82**	**47.52**	**13.10**	**5.29**	**2.33**	**188.26**
Determination of Flow - After Inflow Removal							
INFLOW REDUCTION	*0.00*	*19.47*	*13.47*	*4.67*	*0.00*	*0.00*	**37.61**
INFLOW	21.72	19.47	13.47	4.67	2.93	0.50	**62.76**
PEAK HOURLY FLOW (Scaled)	**50.53**	**40.76**	**29.86**	**7.96**	**5.10**	**2.20**	**136.42**
PEAK INSTANTANEOUS FLOW (Scaled)	**59.10**	**44.54**	**32.75**	**8.26**	**5.29**	**2.33**	**152.27**

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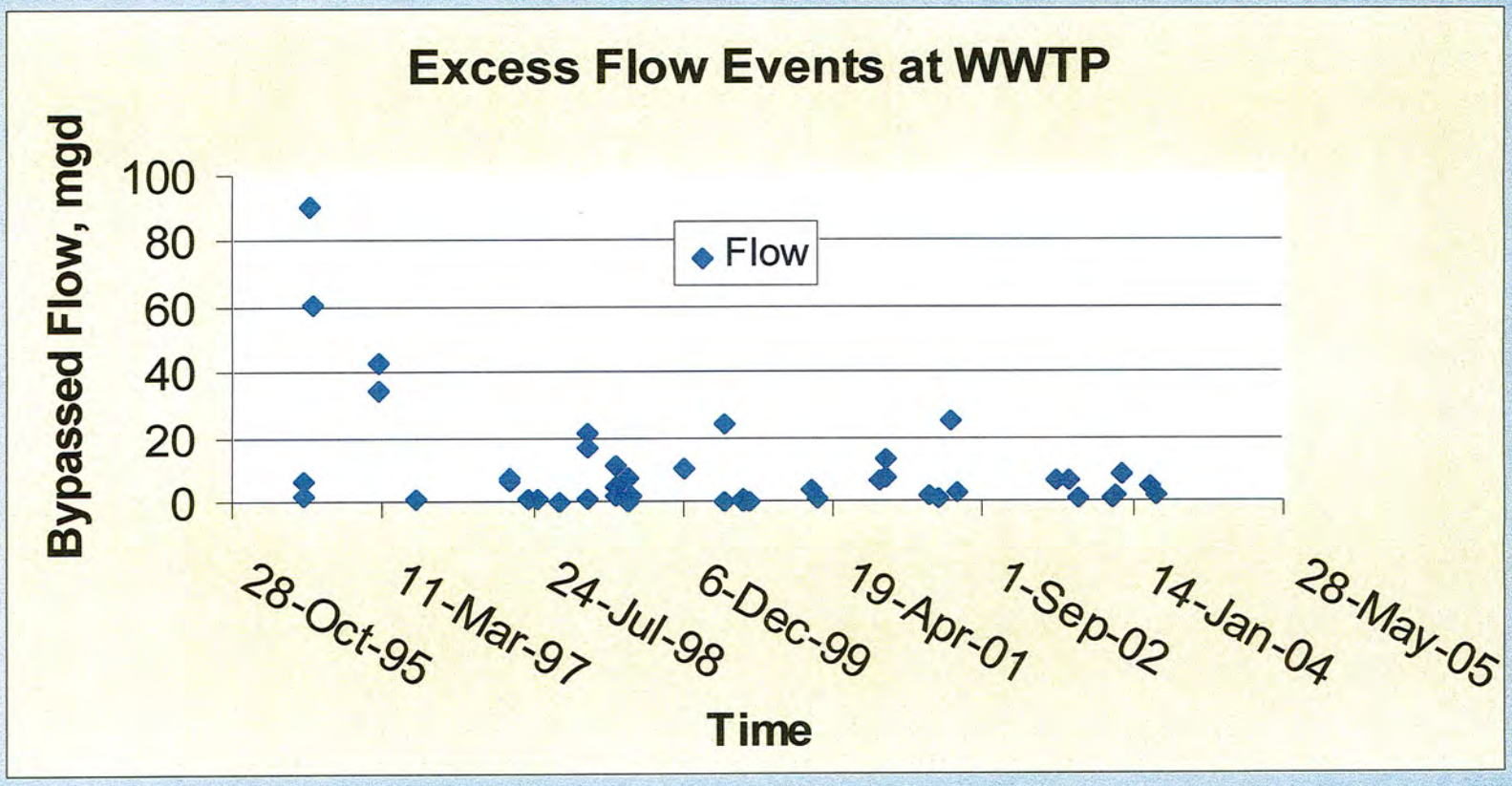
EXISTING CONDITIONS



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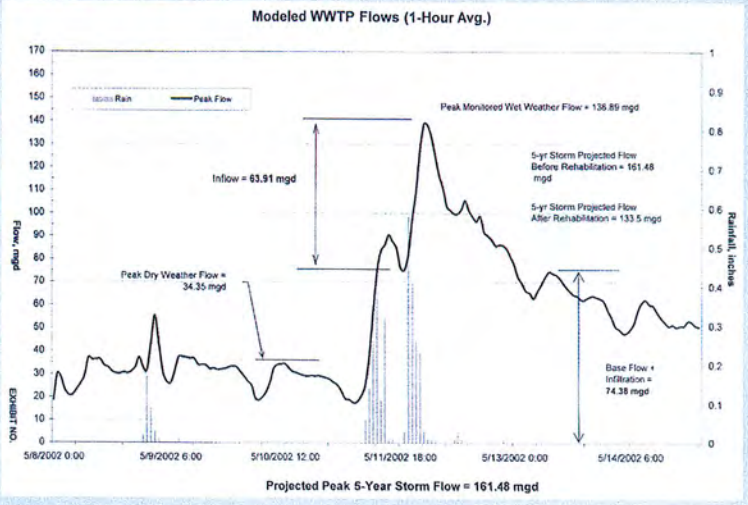
EXISTING CONDITIONS



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EXISTING (2005) CONDITIONS AT WWTP

Peak Instantaneous Flow	167.62 mgd	259.31 cfs
Peak Hourly Flow	162.09 mgd	250.75 cfs
Design Average Flow	31.90 mgd	49.35 cfs

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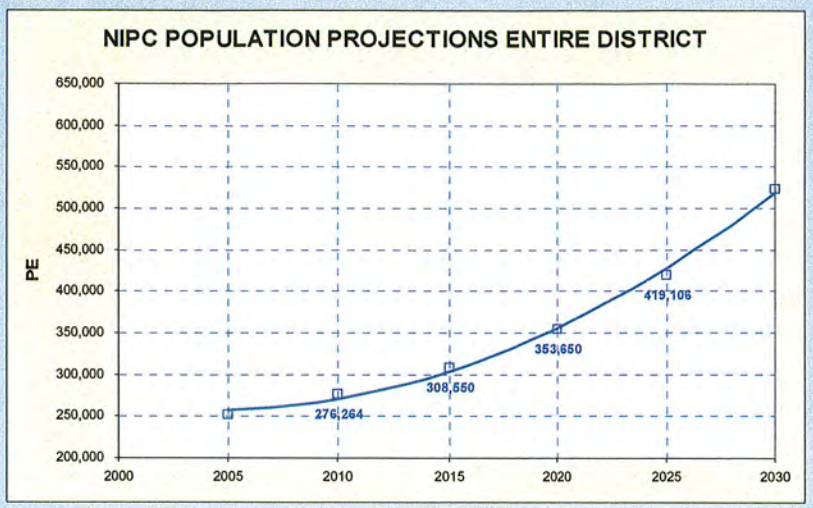
PROJECTED CONDITIONS



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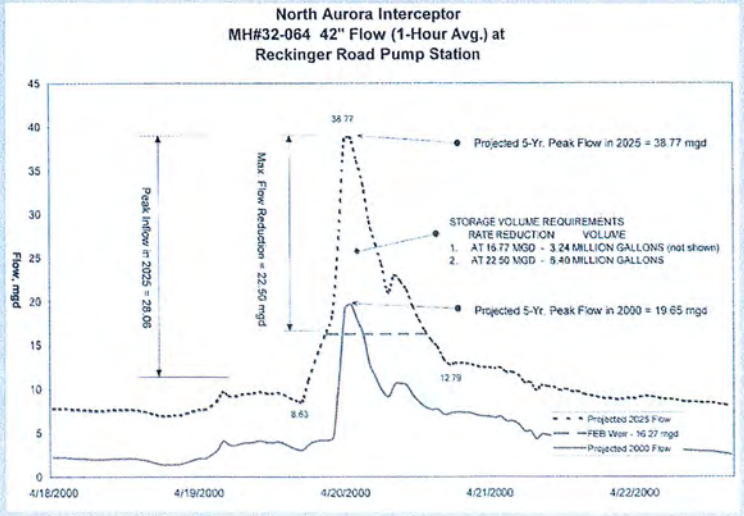
PROJECTED CONDITIONS



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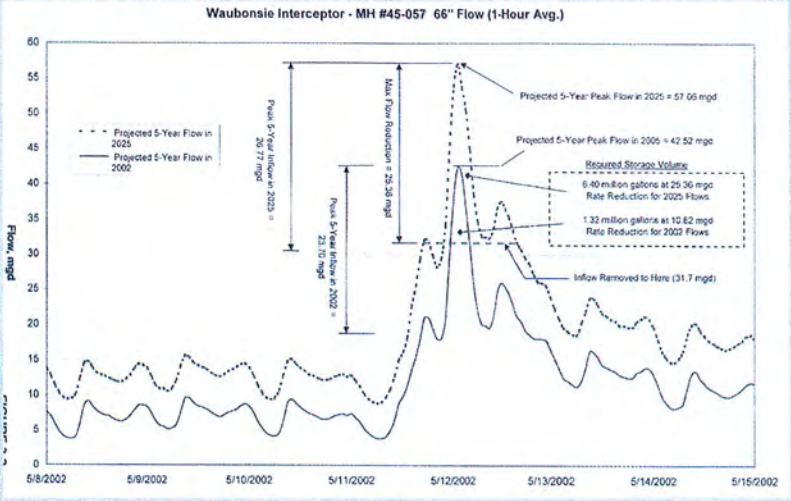
PROJECTED CONDITIONS



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PROJECTED (2025) CONDITIONS AT WWTP

Peak Instantaneous Flow	183.96 mgd	284.59 cfs
Peak Hourly Flow	174.34 mgd	269.70 cfs
Design Average Flow	52.20 mgd	80.75 cfs

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MASTER PLANNING EFFORT

1) Many alternatives for liquid and solids handling were prepared for consideration
2) Option D – Solids Processing was selected for implementation
3) Option 4 – Liquid Processing was selected for implementation

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SELECTED SOLIDS TRAIN OPTION D

Temperature Phased Anaerobic Digestion (TPAD)

- Most cost-effective alternative
- Destroys up to 55% of Volatile Solids
- Produces Class A sludge
- Reduces volume of biosolids

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SELECTED LIQUID TRAIN OPTION 4

Conventional Activated Sludge – 2 Facilities

- Most cost-effective alternative
- Most flexible process layout
- Least disruptive to existing facilities
- Least energy intensive
- Reliable proven technology

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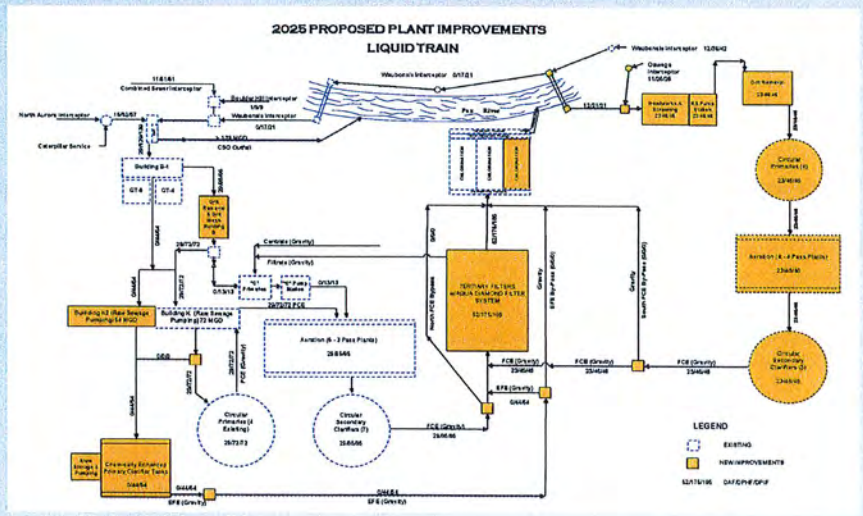
SELECTED LIQUID TRAIN OPTION 4



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MASTER PLAN IMPLEMENTATION

1) **Phase I: Improve wet weather treatment capability and prepare the North Facility for tertiary treatment and disinfection of excess flow facility effluent and future South Facility flows. In addition, digestion facilities will be modified to improve VSS destruction and gas production under higher loadings**
2) **Phase II: First stage of South Facility and first phase of off-site excess flow facilities**
3) **Phase III: Additional off-site excess flow facilities**
4) **Phase IV: Second stage of South Facility and additional off-site excess flow facilities**
5) **Phase V: Additional off-site excess flow facilities**
6) **Phase VI: Third/Final stage of South Facility and final stage of off-site excess flow facilities**

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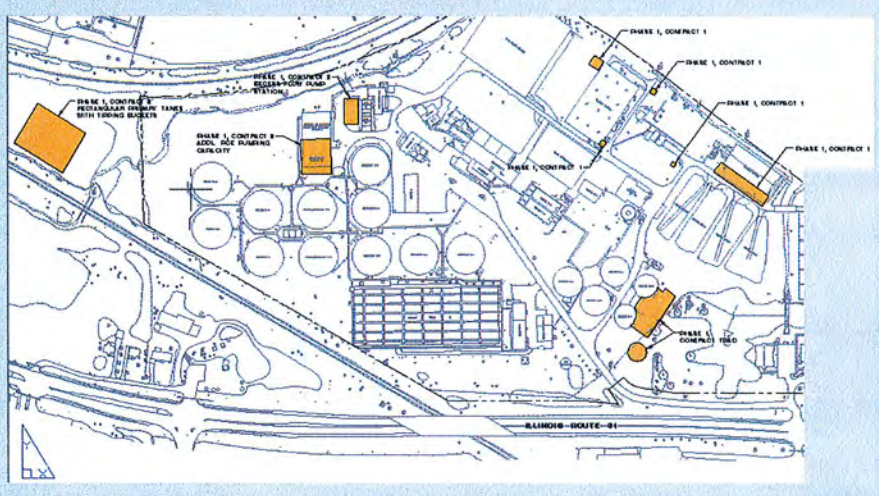
PHASE I: IMPLEMENTATION



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PHASE 1: TPAD CONTRACT

Phase 1: Temperature Phased Anaerobic Digestion (TPAD). Innovative high-rate digestion process, that will provide solids stabilization for approximately 20 years. Part of a phased approach to the implementation of Option D of the Master Plan.

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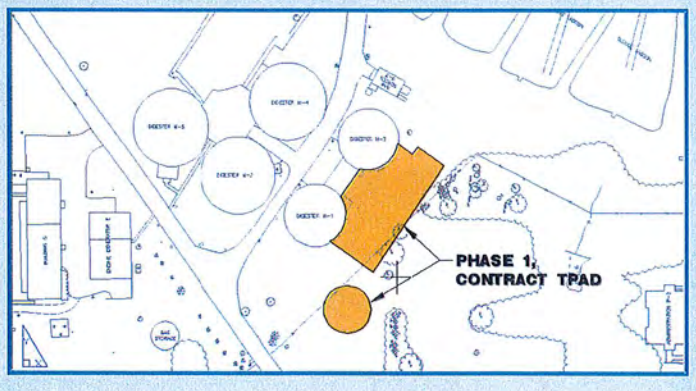
PHASE 1: TPAD CONTRACT HIGHLIGHTS



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PHASE 1: TPAD CONTRACT HIGHLIGHTS

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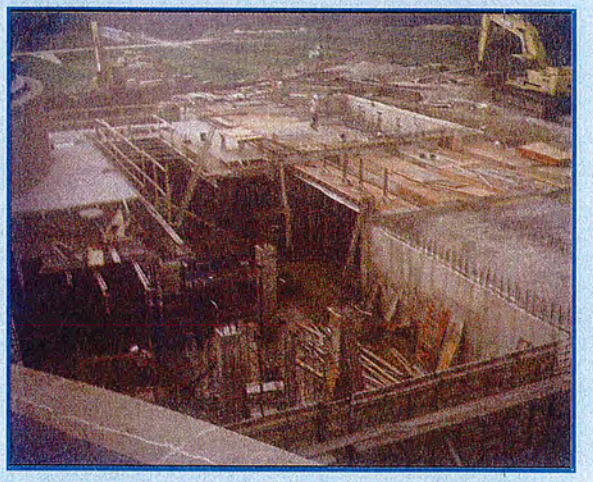
East Basement of TPAD Bldg/PS, CS Tanks



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Digester Control Building M-3

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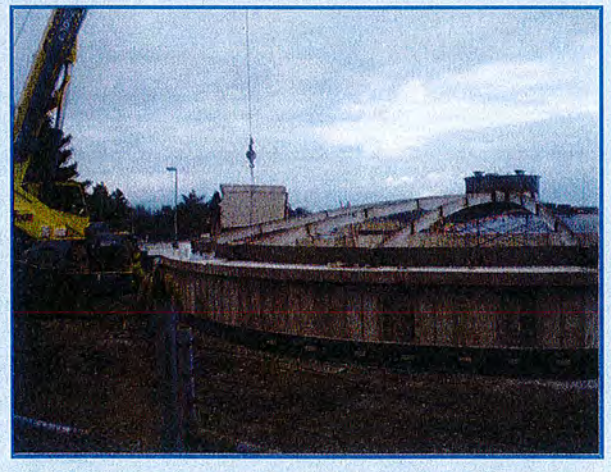
Intermediate Storage Tank Cover Installation



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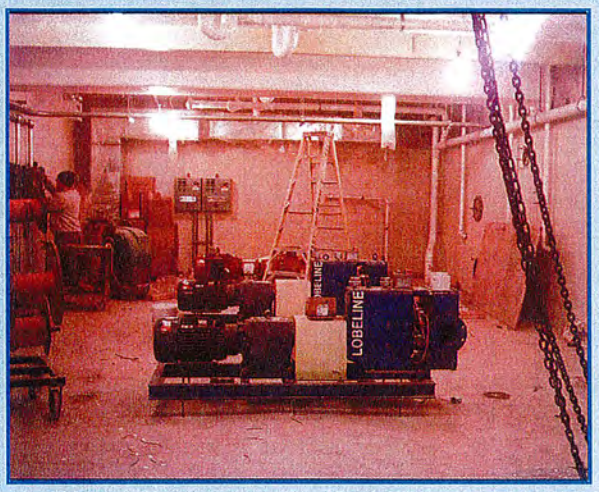
Pumps for Intermediate Storage Tank in West Basement



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Gas Room

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Existing Digester Rehabilitation

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PHASE 1: CONTRACT 1

1) Disinfection Improvements

   Treatment of up to 185 mgd

   a. 85 mgd from Existing North Facilities
   b. 46 mgd from Future South Facilities (Phase II)
   c. 54 mgd from Future Excess Flow Facilities (Contract 3, Phase 1)

2) K2 Pump Station

   Pumps to Future Excess Flow Facilities

   a. Four 225 HP Pumps
   b. Also provides additional flexibility to off-load K Pump Station in event of a problem

3) Tertiary Filter Hydraulic Improvements to increase capacity from 85 mgd to 185 mgd and to direct flows to and around building

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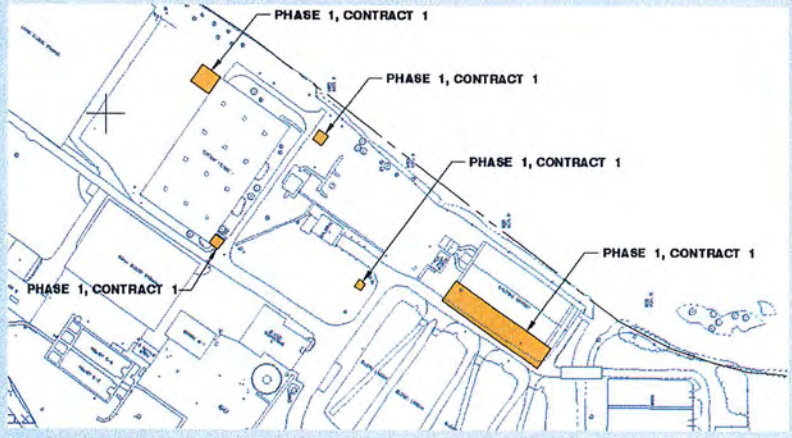
PHASE 1: CONTRACT 1 HIGHLIGHTS



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PHASE 1: CONTRACT 1 HIGHLIGHTS

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South Junction Box

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Relocation of 48" Storm Sewer

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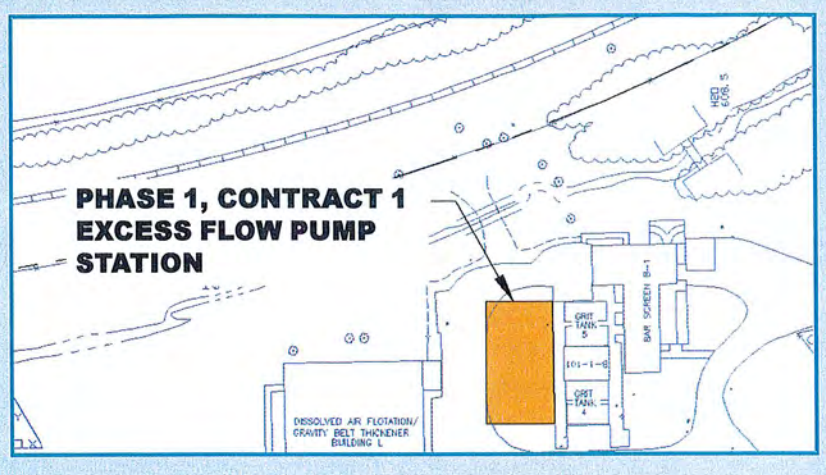
PHASE 1: CONTRACT 1 HIGHLIGHTS



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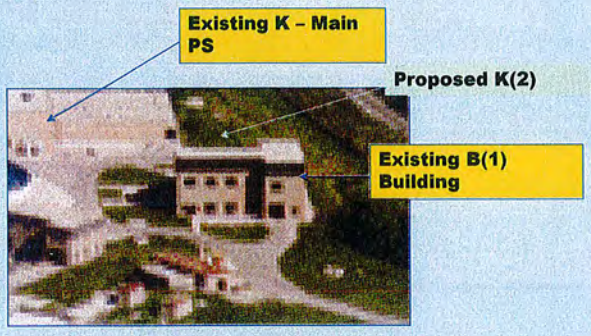
PHASE 1: CONTRACT 1 HIGHLIGHTS



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PHASE 1: CONTRACT 3

Phase 1: Contract 3 - Excess Flow Facility. The excess flow facility consists of rectangular primary tanks for chemically enhanced settling, thus reducing the frequency of discharging untreated flows to the river.

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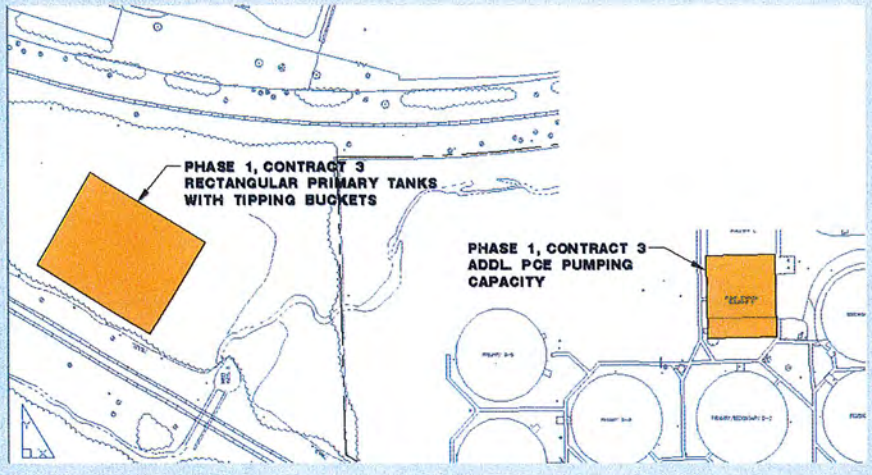
PHASE 1: CONTRACT 3 HIGHLIGHTS



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PHASE 1: CONTRACT 3 HIGHLIGHTS

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TERTIARY FILTER REPLACEMENT

Existing traveling bridge sand filters are being replaced with a new technology (Aqua Diamond cloth filters) that has more than doubled the existing capacity within the same footprint.

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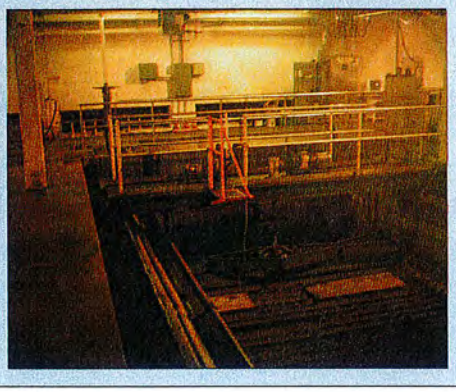
Existing Traveling Bridge Sand Filter



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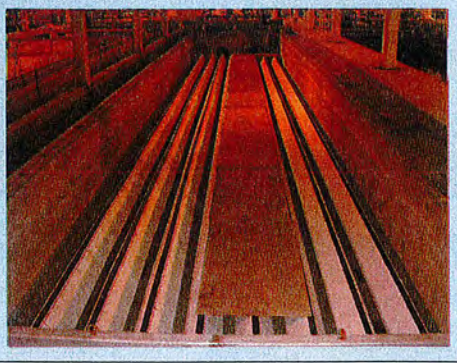
New Aqua Diamond Cloth Filter



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QUESTIONS...

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MEETING AGENDA

CAC Meeting No. 4
July 21, 2009
11:00 a.m. to 1:00 p.m.

Introductions	11:00 a.m.
Review Meeting Minutes – CAC Meeting No. 3 Handouts for CAC Meeting No. 4	
Presentation (John Frerich)	11:15 a.m.
Topic: Sensitive Areas	
Action Item: Sensitive area determination for Fox Metro CSO outfall	
Lunch and Open Discussions	12:30 p.m.
Adjournment	1:00 p.m.

MEETING MINUTES

CAC Meeting No. 3
June 24, 2009 at 11:00 a.m.

Purpose: Meeting No. 3 served to provide the members with an understanding of an existing 20-year Master Plan completed by the Fox Metro Water Reclamation District in 2005 and the current efforts by the District to implement the various phases of the master plan.

Attendees:

CAC Members	
Daryl Devick	City of Aurora
Judith Sotir	Fox Metro WRD
Tim Pollowy	Fox River Ecosystem Partnership
Jackie Dearborn	United City of Yorkville
Michael Glock	Village of North Aurora
Fran Caffee	Sierra Club, Valley of the Fox Group
Jerry Weaver	Village of Oswego
Brad Merkel	Village of Sugar Grove
CAC Support Staff	
Tom Muth	Fox Metro WRD
Jeff Humm	Fox Metro WRD
Roy Harsch	Drinker Biddle & Reath
Philippe Moreau	Walter E. Deuchler Associates, Inc.
John Frerich	Walter E. Deuchler Associates, Inc.
Other Guests	
Mark Halm	Walter E. Deuchler Associates, Inc.

Distribution: The above attendees and the following:

CAC Members	
Michael Pubentz	Village of Montgomery
Bill Donnell	Fox Valley Park District
Joe Wywrot	United City of Yorkville
Other Guests	
Jay Patel	Illinois EPA

Discussion Items:

1. John Frerich welcomed everyone. The following information was handed out to each member to include in their binders: meeting agenda for Meeting No. 3, meeting minutes for Meeting No. 2, , an 11"x17" exhibit titled "2025 Proposed Plant Improvements Liquid Train" highlighting the various proposed treatment plant improvements for the treatment of wastewater and peak excess flows up to the year 2025, and a PowerPoint presentation handout of today's topic "Current Facility Planning Efforts" by the Fox Metro Water Reclamation District.

2. John Frerich gave a PowerPoint presentation regarding the "Current Facility Planning Efforts" by the Fox Metro WRD. The general points of discussion were:

   a. Purpose of master planning efforts for existing wastewater treatment plant facilities
      i. Planning/Design considerations
      ii. Components of master plan
      iii. Existing hydraulic conditions
      iv. Projected hydraulic conditions – Roy Harsch indicated that there is no USEPA criteria regarding storm event intensities in their policies for the planning/design of CSO, WWTP and utility improvements. The 5-year design criteria used by the District is conservative.

   b. Selected alternatives for implementation
      i. Solids Processing - Option D Temperature Phased Anaerobic Digestion (TPAD)
      ii. Liquid Train Processing – Option 4 Conventional Activated Sludge with 2 facilities

   c. Status of implementation of Phase 1 of the master plan
      i. TPAD Contract – under construction
      ii. Contracts 1 & 2 (disinfection, pumping capacity and utility improvements) – under construction
      iii. Contract 3 Excess Flow Facility – facility planning approval from IEPA, under design

iv. Tertiary Filter Improvements – replacement of existing filters with new technology filters, 5 of 9 filters have been replaced and the 6th is under construction.

3. A question and answer session ensued upon conclusion of the presentation. The key topics included the following:

   a. Tim Pollowy inquired about the use of polishing wetlands at the outfalls and land application of the treated effluent. John Frerich advised that polishing wetlands are being looked at as part of Phase 2, however, the impact will likely be minimal due to the large discharge rate (30-40 mgd) from the WWTP. Also, John Frerich advised that the District reuses approximately 2 mgd of its effluent on-site for irrigation, boilers, heat pumps, etc. The District is in the process of designing a pump station and forcemain for the transportation of treated effluent for irrigation purposes at the Fox Valley Park District's Stuart Sports Complex site. These improvements are also being designed for future extension of the forcemain to the Orchard Valley Golf Course site.

   b. Daryl Devick inquired if we had looked at the potential population growth of the District by interceptor service area. John Frerich advised that the projected hydraulic conditions for each interceptor did consider population growth in the service areas tributary to each interceptor. This was also taken into account in developing the appropriate phasing of the proposed facility improvements.

   c. Philippe stated that Jay Patel, Field Office Manager of the IEPA Des Plains office, indicated in a recent conversation the importance of the Citizens Advisory Committee for not only the CSO LTCP but for continuing an open dialogue between the various stakeholders with regards to other issues such as infiltration/inflow, future plant expansion, service area needs, etc. Jay recommended that the CAC continue to meet on a regular basis (quarterly, semi-annually, etc.) after completion of the CSO LTCP.

Next CAC Meeting: The next meeting is scheduled for Wednesday, July 29, 2009 (*subsequently rescheduled via e-mail poll to Tuesday, July 21, 2009*) at 11:00 a.m. at the Fox Metro Water Reclamation District W.J. "Ben" Baines Memorial Administration Building located at 682 State Route 31, Oswego, IL

The above constitutes our understanding of the information discussed and the decisions reached. Any corrections or clarifications should be directed in writing to the attention of the author.

Prepared by: John W. Frerich, P.E.

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Water Reclamation District

POINTS OF DISCUSSION

1) Regulatory Policy
2) Sensitive Area Criteria
3) Sensitive Area Analysis to Date
4) Sensitive Area Determination

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REGULATORY POLICY

EPA Combined Sewer Overflow Control Strategy (Sept. 8, 1989):

"CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the CWA."

Fox Metro Water Reclamation District

REGULATORY POLICY

Objectives of 1989 Policy

1) ***To ensure that if CSOs occur, they are only as a result of wet weather;***
2) ***To bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and***
3) ***To minimize water quality, aquatic biota, and human health impacts from CSOs.***

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REGULATORY POLICY

EPA Combined Sewer Overflow Control Policy (April 19, 1994):

"provides guidance ... on how to meet the Clean Water Act's pollution control goals as flexibly and cost-effectively as possible."

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REGULATORY POLICY

Fundamental Principles of 1994 Policy

1) ***Provide clear levels of control that would be presumed to meet appropriate health and environmental objectives;***
2) ***Provide sufficient flexibility ... to consider the site-specific nature of CSOs and to determine the most cost-effective means (to control them);***
3) ***Allow a phased approach to implementation of CSO controls considering a community's financial capability; and***
4) ***Review and revision of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.***

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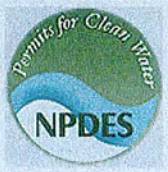
Fox Metro Water Reclamation District

REGULATORY POLICY

Enforcement via NPDES Permit

Item 7. of Special Condition 14. of the District's NPDES Permit No. IL0020818 requires that:

"The Permittee shall provide information sufficient for the IEPA to make a determination pursuant to Section II.C.3 of the federal CSO Control Policy of 1994 as to which of the CSOs, (that) are authorized for discharge in this Permit, discharge into Sensitive Areas."



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SENSITIVE AREA CRITERIA

Section II.C.3 of the 1994 Policy

Expects a long term CSO control plan to give the highest priority to controlling overflows to sensitive areas. For such areas, the LTCP should:

- **Prohibit new or significantly increased overflows;**
- **Eliminate or relocate overflows wherever physically possible and economically achievable, except if it would provide less environmental protection than additional treatment; provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses;**
- **Require a reassessment each permit term based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economic achievability.**

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SENSITIVE AREA CRITERIA

Section II.C.3 of the 1994 Policy

1) Outstanding National Resource Waters;
2) Waters containing threatened or endangered species and their habitat;
3) Shellfish beds;
4) Public drinking water intakes or their designated protection areas;
5) Primary contact recreational areas.

Fox Metro Water Reclamation District

SENSITIVE AREA CRITERIA

CSO Outfall Characteristics

Fox Metro Water Reclamation District

SENSITIVE AREA ANALYSIS TO DATE

Outstanding National Resource Waters

On January 12, 2009, an e-mail from the IEPA indicated that the State of Illinois had no waters listed on the Outstanding National Resource Waters list.

In addition, this segment of the Fox River is designated in the Illinois Integrated Water Quality Report and Section 303(d) List of 2008 as "impaired".

Fox Metro Water Reclamation District

SENSITIVE AREA ANALYSIS TO DATE

Waters Containing Threatened or Endangered Species and their Habitat

A letter dated October 21, 2008 from the IDNR reported that the IDNR's database indicated no River Redhorse recorded in our project area on the Fox River. However, there are records indicating this fish has been sampled both upstream and downstream of the project area.

A letter dated October 22, 2008 from the U.S. Fish and Wildlife Service indicated that the USFWS database contained no records of federal threatened or endangered species or their habitat for the Fox River in our project area.

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SENSITIVE AREA ANALYSIS TO DATE

Shellfish Beds

A letter dated October 21, 2008 from the IDNR reported that the IDNR's database contained no records of mussel beds for the Fox River in our project area.

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

In addition, a mussel sampling study was conducted in the vicinity of the CSO outfall in 2008. A total of 15 mussels representing 6 species were collected. None of the mussels sampled were living and all were classified s weathered.

Fox Metro Water Reclamation District

SENSITIVE AREA ANALYSIS TO DATE

Public Drinking Water Intakes or their Designated Protection Areas

City of Aurora's raw water supply is obtained from a combination of groundwater wells and water from the Fox River. However, the intake from the Fox River is located approximately 4.5 miles upstream of CSO outfall.

Village of Montgomery's raw water supply is obtained solely from groundwater wells.

Village of Oswego's raw water supply is obtained solely from groundwater wells.

There are no other known public drinking water intakes in the vicinity of the CSO outfall

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SENSITIVE AREA ANALYSIS TO DATE

Primary Contact Recreational Areas

Illinois water quality standards define Primary Contact as:

"any recreational or other water use in which there is prolonged and intimate contact with the water involving considerable risk of ingesting water in quantities sufficient to pose a significant health hazard, such as swimming and water skiing."

Illinois water quality standards define Secondary Contact as:

"any recreational or other water use in which contact with the water is either incidental or accidental and in which the probability of ingesting appreciable quantities of water is minimal, such as fishing, commercial and recreational boating and any limited contact incident to shoreline activity."

Fox Metro Water Reclamation District

SENSITIVE AREA ANALYSIS TO DATE

Primary Contact Recreational Areas

According to the Illinois Water Quality Report 2008:

- **Use attainment of river segment is Non Supporting of the following: Aquatic Life, Fish Consumption and Primary Contact .**
- **Causes of impairment: alteration in stream-side or littoral vegetative covers, other flow regime alterations, dissolved oxygen, TSS, pH, Total phosphorus, sedimentation / siltation, aquatic algae, mercury, PCBs, fecal coliform**
- **Sources of impairments: streambank modifications / destabilization, impacts from hydrostructure flow regulation / modification, dam or impoundment, CSOs, urban runoff / storm sewers, municipal point source discharges, atmospheric deposition – toxics, other unknown sources**

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SENSITIVE AREA ANALYSIS TO DATE

Primary Contact Recreational Areas

This segment of the Fox River is designated in the Illinois Integrated Water Quality Report and Section 303(d) List of 2008 as "impaired".

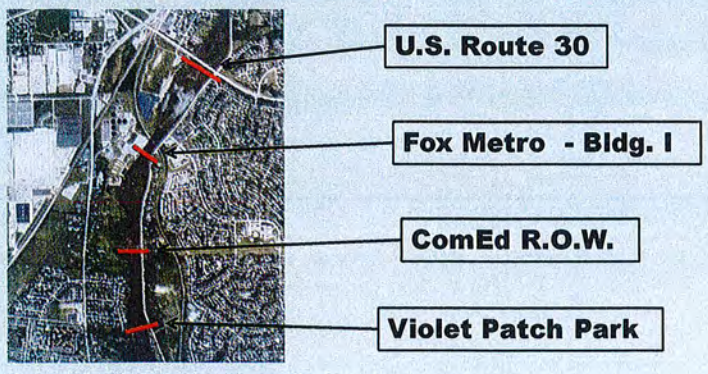
- Does not meet WQS 40% of time in dry weather;
- Does not meet WQS 100% of time in and immediately after wet weather;
- CSOs contribute, but are not only source of impairment.

Fox Metro
Water Reclamation District

SENSITIVE AREA ANALYSIS TO DATE

Primary Contact Recreational Areas

The Fox River is too shallow in the vicinity of the CSO outfall to support primary contact recreational activities such as swimming and water skiing.



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SENSITIVE AREA ANALYSIS TO DATE

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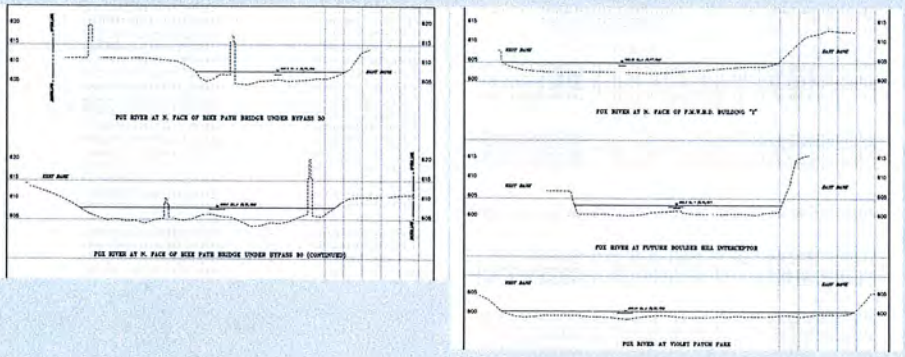

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SENSITIVE AREA ANALYSIS TO DATE

Primary Contact Recreational Areas

Access to the site is limited:

- **WWTP is surrounded by a fence with locked gates**
- **Upstream of the CSO outfall is a railroad bridge over the river - public access to railroad property is prohibited**
- **Property upstream of the railroad also has restricted access and is zoned M-2 General Manufacturing District by the Village of Montgomery**

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SENSITIVE AREA DETERMINATION

- Drinking Water Source
- Threatened or Endangered Species
- Shellfish
- Outstanding State or Natural Resource
- Primarily Recreational Use

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SENSITIVE AREA DETERMINATION...

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federal register

Tuesday
April 19, 1994

Part VII

Environmental Protection Agency

Combined Sewer Overflow (CSO) Control Policy; Notice

ENVIRONMENTAL PROTECTION AGENCY

[FRL-4732-7]

Combined Sewer Overflow (CSO) Control Policy

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final policy.

SUMMARY: EPA has issued a national policy statement entitled "Combined Sewer Overflow (CSO) Control Policy." This policy establishes a consistent national approach for controlling discharges from CSOs to the Nation's waters through the National Pollutant Discharge Elimination System (NPDES) permit program.

FOR FURTHER INFORMATION CONTACT: Jeffrey Lape, Office of Wastewater Enforcement and Compliance, MC-4201, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 260-7361.

SUPPLEMENTARY INFORMATION: The main purposes of the CSO Control Policy are to elaborate on the Environmental Protection Agency's (EPA's) National CSO Control Strategy published on September 8, 1989, at 54 FR 37370, and to expedite compliance with the requirements of the Clean Water Act (CWA). While implementation of the 1989 Strategy has resulted in progress toward controlling CSOs, significant public health and water quality risks remain.

This Policy provides guidance to permittees with CSOs, NPDES authorities and State water quality standards authorities on coordinating the planning, selection, and implementation of CSO controls that meet the requirements of the CWA and allow for public involvement during the decision-making process.

Contained in the Policy are provisions for developing appropriate, site-specific NPDES permit requirements for all combined sewer systems (CSS) that overflow as a result of wet weather events. For example, the Policy lays out two alternative approaches—the "demonstration" and the "presumption" approaches—that provide communities with targets for CSO controls that achieve compliance with the Act, particularly protection of water quality and designated uses. The Policy also includes enforcement initiatives to require the immediate elimination of overflows that occur during dry weather and to ensure that he remaining CWA requirements are complied with as soon as practicable.

The permitting provisions of the Policy were developed as a result of extensive input received from key stakeholders during a negotiated policy dialogue. The CSO stakeholders included representatives from States, environmental groups, municipal organizations and others. The negotiated dialogue was conducted during the Summer of 1992 by the Office of Water and the Office of Water's Management Advisory Group. The enforcement initiatives, including one which is underway to address CSOs during dry weather, were developed by EPA's Office of Water and Office of Enforcement.

EPA issued a Notice of Availability on the draft CSO Control Policy on January 19, 1993, (58 FR 4994) and requested comments on the draft Policy by March 22, 1993. Approximately forty-one sets of written comments were submitted by a variety of interest groups including cities and municipal groups, environmental groups, States, professional organizations and others. All comments were considered as EPA prepared the Final Policy. The public comments were largely supportive of the draft Policy. EPA received broad endorsement of and support for the key principles and provisions from most commenters. Thus, this final Policy does not include significant changes to the major provisions of the draft Policy, but rather, it includes clarification and better explanation of the elements of the Policy to address several of the questions that were raised in the comments. Persons wishing to obtain copies of the public comments or EPA's summary analysis of the comments may write or call the EPA contact person.

The CSO Policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated planning effort to achieve cost effective CSO controls that ultimately meet appropriate health and environmental objectives. The Policy recognizes the site-specific nature of CSOs and their impacts and provides the necessary flexibility to tailor controls to local situations. Major elements of the Policy ensure that CSO controls are cost effective and meet the objectives and requirements of the CWA.

The major provisions of the Policy are as follows.

CSO permittees should immediately undertake a process to accurately characterize their CSS and CSO discharges, demonstrate implementation of minimum technology-based controls identified in the Policy, and develop long-term CSO control plans which evaluate alternatives for attaining compliance with the CWA, including compliance with water quality standards and protection of designated uses. Once the long-term CSO control plans are completed, permittees will be responsible to implement the plans' recommendations as soon as practicable.

State water quality standards authorities will be involved in the long-term CSO control planning effort as well. The water quality standards authorities will help ensure that development of the CSO permittees' long-term CSO control plans are coordinated with the review and possible revision of water quality standards on CSO-impacted waters.

NPDES authorities will issue/reissue or modify permits, as appropriate, to require compliance with the technology-based and water quality-based requirements of the CWA. After completion of the long-term CSO control plan, NPDES permits will be reissued or modified to incorporate the additional requirements specified in the Policy, such as performance standards for the selected controls based on average design conditions, a post-construction water quality assessment program, monitoring for compliance with water quality standards, and a reopener clause authorizing the NPDES authority to reopen and modify the permit if it is determined that the CSO controls fail to meet water quality standards or protect designated uses. NPDES authorities should commence enforcement actions against permittees that have CWA violations due to CSO discharges during dry weather. In addition, NPDES authorities should ensure the implementation of the minimum technology-based controls and incorporate a schedule into an appropriate enforceable mechanism, with appropriate milestone dates, to implement the required long-term CSO control plan. Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability.

EPA is developing extensive guidance to support the Policy and will announce the availability of the guidances and other outreach efforts through various means, as they become available. For example, EPA is preparing guidance on the nine minimum controls, characterization and monitoring of CSOs, development of long-term CSO control plans, and financial capability.

Permittees will be expected to comply with any existing CSO-related requirements in NPDES permits,

onsent decrees or court orders unless evised to be consistent with this Policy.

The policy is organized as follows:

List of Subjects in 40 CFR Part 122

Water pollution control.

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

Dated: April 8, 1994.

Carol M. Browner,

Administrator.

Combined Sewer Overflow (CSO) Control Policy

I. Introduction

A. Purpose and Principles

The main purposes of this Policy are to elaborate on EPA's National Combined Sewer Overflow (CSO) Control Strategy published on September 8, 1989 at 54 FR 37370 (1989 Strategy) and to expedite compliance with the requirements of the Clean Water Act (CWA). While implementation of the 1989 Strategy has resulted in progress toward controlling CSOs, significant water quality risks remain.

A combined sewer system (CSS) is a wastewater collection system owned by a State or municipality (as defined by section 502(4) of the CWA) which conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and storm water through a single-pipe system to a Publicly Owned Treatment Works (POTW) Treatment Plant (as defined in 40 CFR 403.3(p)). A CSO is the discharge from a CSS at a point prior to the POTW Treatment Plant. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the CWA. CSOs are not subject to secondary treatment requirements applicable to POTWs.

CSOs consist of mixtures of domestic sewage, industrial and commercial wastewaters, and storm water runoff. CSOs often contain high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. CSOs can cause exceedances of water quality standards (WQS). Such exceedances may pose risks to human health, threaten aquatic life and its habitat, and impair the use and enjoyment of the Nation's waterways.

This Policy is intended to provide guidance to permittees with CSOs, National Pollutant Discharge Elimination System (NPDES) permitting authorities, State water quality standards authorities and enforcement authorities. The purpose of the Policy is to coordinate the planning, selection, design and implementation of CSO management practices and controls to meet the requirements of the CWA and to involve the public fully during the decision making process.

This Policy reiterates the objectives of the 1989 Strategy:

1. To ensure that if CSOs occur, they are only as a result of wet weather;
2. To bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and
3. To minimize water quality, aquatic biota, and human health impacts from CSOs.

This CSO Control Policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives and requirements. The Policy recognizes the site-specific nature of CSOs and their impacts and provides the necessary flexibility to tailor controls to local situations. Four key principles of the Policy ensure that CSO controls are cost-effective and meet the objectives of the CWA. The key principles are:

1. Providing clear levels of control that would be presumed to meet appropriate health and environmental objectives;
2. Providing sufficient flexibility to municipalities, especially financially disadvantaged communities, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements;
3. Allowing a phased approach to implementation of CSO controls considering a community's financial capability; and
4. Review and revision, as appropriate, of water quality standards and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.

This Policy is being issued in support of EPA's regulations and policy initiatives. This Policy is Agency guidance only and does not establish or affect legal rights or obligations. It does not establish a binding norm and is not finally determinative of the issues addressed. Agency decisions in any particular case will be made by applying the law and regulations on the basis of specific facts when permits are issued. The Administration has recommended that the 1994 amendments to the CWA endorse this final Policy.

B. Application of Policy

The permitting provisions of this Policy apply to all CSSs that overflow as a result of storm water flow, including snow melt runoff (40 CFR 122.26(b)(13)). Discharges from CSSs during dry weather are prohibited by the CWA. Accordingly, the permitting provisions of this Policy do not apply to CSOs during dry weather. Dry weather flow is the flow in a combined sewer that results from domestic sewage, groundwater infiltration, commercial and industrial wastewaters, and any other non-precipitation related flows (e.g., tidal infiltration). In addition to

·he permitting provisions, the nforcement and Compliance section of .nis Policy describes an enforcement initiative being developed for overflows that occur during dry weather.

Consistent with the 1989 Strategy, 30 States that submitted CSO permitting strategies have received EPA approval or, in the case of one State, conditional approval of its strategy. States and EPA Regional Offices should review these strategies and negotiate appropriate revisions to them to implement this Policy. Permitting authorities are encouraged to evaluate water pollution control needs on a watershed management basis and coordinate CSO control efforts with other point and nonpoint source control activities.

C. Effect on Current CSO Control Efforts

EPA recognizes that extensive work has been done by many Regions, States, and municipalities to abate CSOs. As such, portions of this Policy may already have been addressed by permittees' previous efforts to control CSOs. Therefore, portions of this Policy may not apply, as determined by the permitting authority on a case-by-case basis, under the following circumstances:

1. Any permittee that, on the date of ublication of this final Policy, has .ompleted or substantially completed construction of CSO control facilities that are designed to meet WQS and protect designated uses, and where it has been determined that WQS are being or will be attained, is not covered by the initial planning and construction provisions in this Policy; however, the operational plan and post-construction monitoring provisions continue to apply. If, after monitoring, it is determined that WQS are not being attained, the permittee should be required to submit a revised CSO control plan that, once implemented, will attain WQS.

2. Any permittee that, on the date of publication of this final Policy, has substantially developed or is implementing a CSO control program pursuant to an existing permit or enforcement order, and such program is considered by the NPDES permitting authority to be adequate to meet WQS and protect designated uses and is reasonably equivalent to the treatment objectives of this Policy, should complete those facilities without further planning activities otherwise expected by this Policy. Such programs, however, should be reviewed and modified to be onsistent with the sensitive area, financial capability, and post-construction monitoring provisions of this Policy.

3. Any permittee that has previously constructed CSO control facilities in an effort to comply with WQS but has failed to meet such applicable standards or to protect designated uses due to remaining CSOs may receive consideration for such efforts in future permits or enforceable orders for long-term CSO control planning, design and implementation.

In the case of any ongoing or substantially completed CSO control effort, the NPDES permit or other enforceable mechanism, as appropriate, should be revised to include all appropriate permit requirements consistent with Section IV.B. of this Policy.

D. Small System Considerations

The scope of the long-term CSO control plan, including the characterization, monitoring and modeling, and evaluation of alternatives portions of this Policy may be difficult for some small CSSs. At the discretion of the NPDES Authority, jurisdictions with populations under 75,000 may not need to complete each of the formal steps outlined in Section II.C. of this Policy, but should be required through their permits or other enforceable mechanisms to comply with the nine minimum controls (II.B), public participation (II.C.2), and sensitive areas (II.C.3) portions of this Policy. In addition, the permittee may propose to implement any of the criteria contained in this Policy for evaluation of alternatives described in II.C.4. Following approval of the proposed plan, such jurisdictions should construct the control projects and propose a monitoring program sufficient to determine whether WQS are attained and designated uses are protected.

In developing long-term CSO control plans based on the small system considerations discussed in the preceding paragraph, permittees are encouraged to discuss the scope of their long-term CSO control plan with the WQS authority and the NPDES authority. These discussions will ensure that the plan includes sufficient information to enable the permitting authority to identify the appropriate CSO controls.

E. Implementation Responsibilities

NPDES authorities (authorized States or EPA Regional Offices, as appropriate) are responsible for implementing this Policy. It is their responsibility to assure that CSO permittees develop long-term CSO control plans and that NPDES permits meet the requirements of the CWA. Further, they are responsible for coordinating the review of the long-term CSO control plan and the development of the permit with the WQS authority to determine if revisions to the WQS are appropriate. In addition, they should determine the appropriate vehicle (i.e., permit reissuance, information request under CWA section 308 or State equivalent or enforcement action) to ensure that compliance with the CWA is achieved as soon as practicable.

Permittees are responsible for documenting the implementation of the nine minimum controls and developing and implementing a long-term CSO control plan, as described in this Policy. EPA recognizes that financial considerations are a major factor affecting the implementation of CSO controls. For that reason, this Policy allows consideration of a permittee's financial capability in connection with the long-term CSO control planning effort, WQS review, and negotiation of enforceable schedules. However, each permittee is ultimately responsible for aggressively pursuing financial arrangements for the implementation of its long-term CSO control plan. As part of this effort, communities should apply to their State Revolving Fund program, or other assistance programs as appropriate, for financial assistance.

EPA and the States will undertake action to assure that all permittees with CSSs are subject to a consistent review in the permit development process, have permit requirements that achieve compliance with the CWA, and are subject to enforceable schedules that require the earliest practicable compliance date considering physical and financial feasibility.

F. Policy Development

This Policy devotes a separate section to each step involved in developing and implementing CSO controls. This is not to imply that each function occurs separately. Rather, the entire process surrounding CSO controls, community planning, WQS and permit development/revision, enforcement/compliance actions and public participation must be coordinated to control CSOs effectively. Permittees and permitting authorities are encouraged to consider innovative and alternative approaches and technologies that achieve the objectives of this Policy and the CWA.

In developing this Policy, EPA has included information on what responsible parties are expected to accomplish. Subsequent documents will provide additional guidance on how the objectives of this Policy should be met. These documents will provide further guidance on: CSO permit writing, the nine minimum controls, long-term CSO

control plans, financial capability, sewer system characterization and receiving water monitoring and modeling, and application of WQS to CSO-impacted waters. For most CSO control efforts however, sufficient detail has been included in this Policy to begin immediate implementation of its provisions.

II. EPA Objectives for Permittees

A. Overview

Permittees with CSSs that have CSOs should immediately undertake a process to accurately characterize their sewer systems, to demonstrate implementation of the nine minimum controls, and to develop a long-term CSO control plan.

B. Implementation of the Nine Minimum Controls

Permittees with CSOs should submit appropriate documentation demonstrating implementation of the nine minimum controls, including any proposed schedules for completing minor construction activities. The nine minimum controls are:

1. Proper operation and regular maintenance programs for the sewer system and the CSOs;
2. Maximum use of the collection system for storage;
3. Review and modification of pretreatment requirements to assure CSO impacts are minimized;
4. Maximization of flow to the POTW for treatment;
5. Prohibition of CSOs during dry weather;
6. Control of solid and floatable materials in CSOs;
7. Pollution prevention;
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

Selection and implementation of actual control measures should be based on site-specific considerations including the specific CSS's characteristics discussed under the sewer system characterization and monitoring portions of this Policy. Documentation of the nine minimum controls may include operation and maintenance plans, revised sewer use ordinances for industrial users, sewer system inspection reports, infiltration/inflow studies, pollution prevention programs, public notification plans, and facility plans for maximizing the capacities of the existing collection, storage and treatment systems, as well as contracts and schedules for minor construction programs for improving the existing system's operation. The permittee should also submit any information or data on the degree to which the nine minimum controls achieve compliance with water quality standards. These data and information should include results made available through monitoring and modeling activities done in conjunction with the development of the long-term CSO control plan described in this Policy.

This documentation should be submitted as soon as practicable, but no later than two years after the requirement to submit such documentation is included in an NPDES permit or other enforceable mechanism. Implementation of the nine minimum controls with appropriate documentation should be completed as soon as practicable but no later than January 1, 1997. These dates should be included in an appropriate enforceable mechanism.

Because the CWA requires immediate compliance with technology-based controls (section 301(b)), which on a Best Professional Judgment basis should include the nine minimum controls, a compliance schedule for implementing the nine minimum controls, if necessary, should be included in an appropriate enforceable mechanism.

C. Long-Term CSO Control Plan

Permittees with CSOs are responsible for developing and implementing long-term CSO control plans that will ultimately result in compliance with the requirements of the CWA. The long-term plans should consider the site-specific nature of CSOs and evaluate the cost effectiveness of a range of control options/strategies. The development of the long-term CSO control plan and its subsequent implementation should also be coordinated with the NPDES authority and the State authority responsible for reviewing and revising the State's WQS. The selected controls should be designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS, including existing and designated uses.

This policy identifies EPA's major objectives for the long-term CSO control plan. Permittees should develop and submit this long-term CSO control plan as soon as practicable, but generally within two years after the date of the NPDES permit provision, Section 308 information request, or enforcement action requiring the permittee to develop the plan. NPDES authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors which may influence the complexity of the planning process. Once agreed upon, these dates should be included in an appropriate enforceable mechanism.

EPA expects each long-term CSO control plan to utilize appropriate information to address the following minimum elements. The Plan should also include both fixed-date project implementation schedules (which may be phased) and a financing plan to design and construct the project as soon as practicable. The minimum elements of the long-term CSO control plan are described below.

1. Characterization, Monitoring, and Modeling of the Combined Sewer System

In order to design a CSO control plan adequate to meet the requirements of the CWA, a permittee should have a thorough understanding of its sewer system, the response of the system to various precipitation events, the characteristics of the overflows, and the water quality impacts that result from CSOs. The permittee should adequately characterize through monitoring, modeling, and other means as appropriate, for a range of storm events, the response of its sewer system to wet weather events including the number, location and frequency of CSOs, volume, concentration and mass of pollutants discharged and the impacts of the CSOs on the receiving waters and their designated uses. The permittee may need to consider information on the contribution and importance of other pollution sources in order to develop a final plan designed to meet water quality standards. The purpose of the system characterization, monitoring and modeling program initially is to assist the permittee in developing appropriate measures to implement the nine minimum controls and, if necessary, to support development of the long-term CSO control plan. The monitoring and modeling data also will be used to evaluate the expected effectiveness of both the nine minimum controls and, if necessary, the long-term CSO controls, to meet WQS.

The major elements of a sewer system characterization are described below.

a. Rainfall Records—The permittee should examine the complete rainfall record for the geographic area of its existing CSS using sound statistical procedures and best available data. The permittee should evaluate flow variations in the receiving water body to correlate between CSOs and receiving water conditions.

b. Combined Sewer System Characterization—The permittee should evaluate the nature and extent of its sewer system through evaluation of available sewer system records, field inspections and other activities necessary to understand the number, location and frequency of overflows and their location relative to sensitive areas and to pollution sources in the collection system, such as indirect significant industrial users.

c. CSO Monitoring—The permittee should develop a comprehensive, representative monitoring program that measures the frequency, duration, flow rate, volume and pollutant concentration of CSO discharges and assesses the impact of the CSOs on the receiving waters. The monitoring program should include necessary CSO effluent and ambient in-stream monitoring and, where appropriate, other monitoring protocols such as biological assessment, toxicity testing and sediment sampling. Monitoring parameters should include, for example, oxygen demanding pollutants, nutrients, toxic pollutants, sediment contaminants, pathogens, bacteriological indicators (e.g., Enterococcus, E. Coli), and toxicity. A representative sample of overflow points can be selected that is sufficient to allow characterization of CSO discharges and their water quality impacts and to facilitate evaluation of control plan alternatives.

d. Modeling—Modeling of a sewer system is recognized as a valuable tool for predicting sewer system response to various wet weather events and assessing water quality impacts when evaluating different control strategies and alternatives. EPA supports the proper and effective use of models, where appropriate, in the evaluation of the nine minimum controls and the development of the long-term CSO control plan. It is also recognized that there are many models which may be used to do this. These models range from simple to complex. Having decided to use a model, the permittee should base its choice of a model on the characteristics of its sewer system, the number and location of overflow points, and the sensitivity of the receiving water body to the CSO discharges. Use of models should include appropriate calibration and verification with field *measurements*. The sophistication of the model should relate to the complexity of the system to be modeled and to the information needs associated with evaluation of CSO control options and water quality impacts. EPA believes that continuous simulation models, using historical rainfall data, may be the best way to model sewer systems, CSOs, and their impacts. Because of the iterative nature of modeling sewer systems, CSOs, and their impacts, monitoring and modeling efforts are complementary and should be coordinated.

2. Public Participation

In developing its long-term CSO control plan, the permittee will employ a public participation process that actively involves the affected public in the decision-making to select the long-term CSO controls. The affected public includes rate payers, industrial users of the sewer system, persons who reside downstream from the CSOs, persons who use and enjoy these downstream waters, and any other interested persons.

3. Consideration of Sensitive Areas

EPA expects a permittee's long-term CSO control plan to give the highest priority to controlling overflows to sensitive areas. Sensitive areas, as determined by the NPDES authority in coordination with State and Federal agencies, as appropriate, include designated Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, and shellfish beds. For such areas, the long-term CSO control plan should:

a. Prohibit new or significantly increased overflows;

b. i. Eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment; or

ii. Where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses. In any event, the level of control should not be less than those described in Evaluation of Alternatives below; and

c. Where elimination or relocation has been proven not to be physically possible and economically achievable, permitting authorities should require, for each subsequent permit term, a reassessment based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economic achievability.

4. Evaluation of Alternatives

EPA expects the long-term CSO control plan to consider a reasonable range of alternatives. The plan should, for example, evaluate controls that would be necessary to achieve zero overflow events per year, an average of one to three, four to seven, and eight to twelve overflow events per year. Alternatively, the long-term plan could evaluate controls that achieve 100% capture, 90% capture, 85% capture, 80% capture, and 75% capture for treatment. The long-term control plan should also consider expansion of POTW secondary and primary capacity in the CSO abatement alternative analysis. The analysis of alternatives should be sufficient to make a reasonable assessment of cost and performance as described in Section II.C.5. Because the final long-term CSO control plan will become the basis for NPDES permit limits and requirements, the selected controls should be sufficient to meet CWA requirements.

In addition to considering sensitive areas, the long-term CSO control plan should adopt one of the following approaches:

a. "Presumption" Approach

A program that meets any of the criteria listed below would be presumed to provide an adequate level of control to meet the water quality-based requirements of the CWA, provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring, and modeling of the system and the consideration of sensitive areas described above. These criteria are provided because data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS.

i. No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified below; or

ii. The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or

iii. The elimination or removal of no less than the mass of the pollutants, identified as causing water quality impairment through the sewer system

haracterization, monitoring, and odeling effort, for the volumes that would be eliminated or captured for treatment under paragraph ii. above. Combined sewer flows remaining after implementation of the nine minimum controls and within the criteria specified at II.C.4.a.i or ii, should receive a minimum of:

- Primary clarification (Removal of floatables and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification.);
- Solids and floatables disposal; and
- Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect human health, including removal of harmful disinfection chemical residuals, where necessary.

b. "Demonstration" Approach

A permittee may demonstrate that a selected control program, though not meeting the criteria specified in II.C.4.a. above is adequate to meet the water quality-based requirements of the CWA. To be a successful demonstration, the permittee should demonstrate each of the following:

i. The planned control program is adequate to meet WQS and protect designated uses, unless WQS or uses cannot be met as a result of natural background conditions or pollution sources other than CSOs;

ii. The CSO discharges remaining after implementation of the planned control program will not preclude the attainment of WQS or the receiving waters' designated uses or contribute to their impairment. Where WQS and designated uses are not met in part because of natural background conditions or pollution sources other than CSOs, a total maximum daily load, including a wasteload allocation and a load allocation, or other means should be used to apportion pollutant loads;

iii. The planned control program will provide the maximum pollution reduction benefits reasonably attainable; and

iv. The planned control program is designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS or designated uses.

5. Cost/Performance Considerations

The permittee should develop appropriate cost/performance curves to demonstrate the relationships among a comprehensive set of reasonable control alternatives that correspond to the different ranges specified in Section II.C.4. This should include an analysis to determine where the increment of pollution reduction achieved in the receiving water diminishes compared to the increased costs. This analysis, often known as knee of the curve, should be among the considerations used to help guide selection of controls.

6. Operational Plan

After agreement between the permittee and NPDES authority on the necessary CSO controls to be implemented under the long-term CSO control plan, the permittee should revise the operation and maintenance program developed as part of the nine minimum controls to include the agreed-upon long-term CSO controls. The revised operation and maintenance program should maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system. For any flows in excess of the criteria specified at II.C.4.a.i., ii. or iii and not receiving the treatment specified in II.C.4.a, the operational plan should ensure that such flows receive treatment to the greatest extent practicable.

7. Maximizing Treatment at the Existing POTW Treatment Plant

In some communities, POTW treatment plants may have primary treatment capacity in excess of their secondary treatment capacity. One effective strategy to abate pollution resulting from CSOs is to maximize the delivery of flows during wet weather to the POTW treatment plant for treatment. Delivering these flows can have two significant water quality benefits: First, increased flows during wet weather to the POTW treatment plant may enable the permittee to eliminate or minimize overflows to sensitive areas; second, this would maximize the use of available POTW facilities for wet weather flows and would ensure that combined sewer flows receive at least primary treatment prior to discharge.

Under EPA regulations, the intentional diversion of waste streams from any portion of a treatment facility, including secondary treatment, is a bypass. EPA bypass regulations at 40 CFR 122.41(m) allow for a facility to bypass some or all the flow from its treatment process under specified limited circumstances. Under the regulation, the permittee must show that the bypass was unavoidable to prevent loss of life, personal injury or severe property damage, that there was no feasible alternative to the bypass and that the permittee submitted the required notices. In addition, the regulation provides that a bypass may be approved only after consideration of adverse effects.

Normally, it is the responsibility of the permittee to document, on a case-by-base basis, compliance with 40 CFR 122.41(m) in order to bypass flows legally. For some CSO-related permits, the study of feasible alternatives in the control plan may provide sufficient support for the permit record and for approval of a CSO-related bypass in the permit itself, and to define the specific parameters under which a bypass can legally occur. For approval of a CSO-related bypass, the long-term CSO control plan, at a minimum, should provide justification for the cut-off point at which the flow will be diverted from the secondary treatment portion of the treatment plant, and provide a benefit-cost analysis demonstrating that conveyance of wet weather flow to the POTW for primary treatment is more beneficial than other CSO abatement alternatives such as storage and pump back for secondary treatment, sewer separation, or satellite treatment. Such a permit must define under what specific wet weather conditions a CSO-related bypass is allowed and also specify what treatment or what monitoring, and effluent limitations and requirements apply to the bypass flow. The permit should also provide that approval for the CSO-related bypass will be reviewed and may be modified or terminated if there is a substantial increase in the volume or character of pollutants being introduced to the POTW. The CSO-related bypass provision in the permit should also make it clear that all wet weather flows passing the headworks of the POTW treatment plant will receive at least primary clarification and solids and floatables removal and disposal, and disinfection, where necessary, and any other treatment that can reasonably be provided.

Under this approach, EPA would allow a permit to authorize a CSO-related bypass of the secondary treatment portion of the POTW treatment plant for combined sewer flows in certain identified circumstances. This provision would apply only to those situations where the POTW would ordinarily meet the requirements of 40 CFR 122.41(m) as evaluated on a case-by-case basis. Therefore, there must be sufficient data in the administrative record (reflected in the permit fact sheet or statement of basis) supporting all the requirements in 40 CFR 122.41(m)(4) for approval of an anticipated bypass.

For the purposes of applying this regulation to CSO permittees, "severe property damage" could include

situations where flows above a certain level wash out the POTW's secondary treatment system. EPA further believes that the feasible alternatives requirement of the regulation can be met if the record shows that the secondary treatment system is properly operated and maintained, that the system has been designed to meet secondary limits for flows greater than the peak dry weather flow, plus an appropriate quantity of wet weather flow, and that it is either technically or financially infeasible to provide secondary treatment at the existing facilities for greater amounts of wet weather flow. The feasible alternative analysis should include, for example, consideration of enhanced primary treatment (e.g., chemical addition) and non-biological secondary treatment. Other bases supporting a finding of no feasible alternative may also be available on a case-by-case basis. As part of its consideration of possible adverse effects resulting from the bypass, the permitting authority should also ensure that the bypass will not cause exceedances of WQS.

This Policy does not address the appropriateness of approving anticipated bypasses through NPDES permits in advance outside the CSO context.

8. Implementation Schedule

The permittee should include all pertinent information in the long term control plan necessary to develop the construction and financing schedule for implementation of CSO controls. Schedules for implementation of the CSO controls may be phased based on the relative importance of adverse impacts upon WQS and designated uses, priority projects identified in the long-term plan, and on a permittee's financial capability.

Construction phasing should consider:

a. Eliminating overflows that discharge to sensitive areas as the highest priority;

b. Use impairment;

c. The permittee's financial capability including consideration of such factors as:

i. Median household income;

ii. Total annual wastewater and CSO control costs per household as a percent of median household income;

iii. Overall net debt as a percent of full market property value;

iv. Property tax revenues as a percent of full market property value;

v. Property tax collection rate;

vi. Unemployment; and

vii. Bond rating;

d. Grant and loan availability;

e. Previous and current residential, commercial and industrial sewer user fees and rate structures; and

f. Other viable funding mechanisms and sources of financing.

9. Post-Construction Compliance Monitoring Program

The selected CSO controls should include a post-construction water quality monitoring program adequate to verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls. This water quality compliance monitoring program should include a plan to be approved by the NPDES authority that details the monitoring protocols to be followed, including the necessary effluent and ambient monitoring and, where appropriate, other monitoring protocols such as biological assessments, whole effluent toxicity testing, and sediment sampling.

III. Coordination With State Water Quality Standards

A. Overview

WQS are State adopted, or Federally promulgated rules which serve as the goals for the water body and the legal basis for the water quality-based NPDES permit requirements under the CWA. WQS consist of uses which States designate for their water bodies, criteria to protect the uses, an anti-degradation policy to protect the water quality improvements gained and other policies affecting the implementation of the standards. A primary objective of the long-term CSO control plan is to meet WQS, including the designated uses through reducing risks to human health and the environment by eliminating, relocating or controlling CSOs to the affected waters.

State WQS authorities, NPDES authorities, EPA regional offices, permittees, and the public should meet early and frequently throughout the long-term CSO control planning process. Development of the long-term plan should be coordinated with the review and appropriate revision of WQS and implementation procedures on CSO-impacted waters to ensure that the long-term controls will be sufficient to meet water quality standards. As part of these meetings, participants should agree on the data, information and analyses needed to support the development of the long-term CSO control plan and the review of applicable WQS, and implementation procedures, if appropriate. Agreements should be reached on the monitoring protocols and models that will be used to evaluate the water quality impacts of the overflows, to analyze the attainability of the WQS and to determine the water quality-based requirements for the permit. Many opportunities exist for permittees and States to share information as control programs are developed and as WQS are reviewed. Such information should assist States in determining the need for revisions to WQS and implementation procedures to better reflect the site-specific wet weather impacts of CSOs. Coordinating the development of the long-term CSO control plan and the review of the WQS and implementation procedures provides greater assurance that the long-term control plan selected and the limits and requirements included in the NPDES permit will be sufficient to meet WQS and to comply with sections 301(b)(1)(C) and 402(a)(2) of the CWA.

EPA encourages States and permittees jointly to sponsor workshops for the affected public in the development of the long-term CSO control plan and during the development of appropriate revisions to WQS for CSO-impacted waters. Workshops provide a forum for including the public in discussions of the implications of the proposed long-term CSO control plan on the water quality and uses for the receiving water.

B. Water Quality Standards Reviews

The CWA requires States to periodically, but at least once every three years, hold public hearings for the purpose of reviewing applicable water quality standards and, as appropriate, modifying and adopting standards. States must provide the public an opportunity to comment on any proposed revision to water quality standards and all revisions must be submitted to EPA for review and approval.

EPA regulations and guidance provide States with the flexibility to adapt their WQS, and implementation procedures to reflect site-specific conditions including those related to CSOs. For example, a State may adopt site-specific criteria for a particular pollutant if the State determines that the site-specific criteria fully protects the designated use (40 CFR 131.11). In addition, the regulations at 40 CFR 131.10(g), (h), and (j) specify when and how a designated use may be modified. A State may remove a designated use from its water quality standards only if the designated use is not an existing use. An existing use is a use actually attained in the water body on or after November 28, 1975. Furthermore, a State may not remove a designated use that will be attained by implementing the

technology-based effluent limits required under sections 301(b) and 306 of the CWA and by implementing cost-effective and reasonable best management practices for nonpoint source controls. Thus, if a State has a reasonable basis to determine that the current designated use could be attained after implementation of the technology-based controls of the CWA, then the use could not be removed.

In determining whether a use is attainable and prior to removing a designated use, States must conduct and submit to EPA a use attainability analysis. A use attainability analysis is a structured scientific assessment of the factors affecting the use, including the physical, chemical, biological, and economic factors described in 40 CFR 131.10(g). As part of the analysis, States should evaluate whether the designated use could be attained if CSO controls were implemented. For example, States should examine if sediment loadings from CSOs could be reduced so as not to bury spawning beds, or if biochemical oxygen demanding material in the effluent or the toxicity of the effluent could be corrected so as to reduce the acute or chronic physiological stress on or bioaccumulation potential of aquatic organisms.

In reviewing the attainability of their WQS and the applicability of their implementation procedures to CSO-impacted waters, States are encouraged to define more explicitly their recreational and aquatic life uses and then, if appropriate, modify the criteria accordingly to protect the designated uses.

Another option is for States to adopt partial uses by defining when primary contact recreation such as swimming does not exist, such as during certain seasons of the year in northern climates or during a particular type of storm event. In making such adjustments to their uses, States must ensure that downstream uses are protected, and that during other seasons or after the storm event has passed, the use is fully protected.

In addition to defining recreational uses with greater specificity, States are also encouraged to define the aquatic uses more precisely. Rather than "aquatic life use protection," States should consider defining the type of fishery to be protected such as a cold water fishery (e.g., trout or salmon) or a warm weather fishery (e.g., bluegill or large mouth bass). Explicitly defining the type of fishery to be protected may assist the permittee in enlisting the support of citizens for a CSO control plan.

A water quality standard variance may be appropriate, in limited circumstances on CSO-impacted waters, where the State is uncertain as to whether a standard can be attained and time is needed for the State to conduct additional analyses on the attainability of the standard. Variances are short-term modifications in water quality standards. Subject to EPA approval, States, with their own statutory authority, may grant a variance to a specific discharger for a specific pollutant. The justification for a variance is similar to that required for a permanent change in the standard, although the showings needed are less rigorous. Variances are also subject to public participation requirements of the water quality standards and permits programs and are reviewable generally every three years. A variance allows the CSO permit to be written to meet the "modified" water quality standard as analyses are conducted and as progress is made to improve water quality.

Justifications for variances are the same as those identified in 40 CFR 131.10(g) for modifications in uses. States must provide an opportunity for public review and comment on all variances. If States use the permit as the vehicle to grant the variance, notice of the permit must clearly state that the variance modifies the State's water quality standards. If the variance is approved, the State appends the variance to the State's standards and reviews the variance every three years.

IV. Expectations for Permitting Authorities

A. Overview

CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the CWA. CSOs are not subject to secondary treatment regulations applicable to publicly owned treatment works (*Montgomery Environmental Coalition vs. Costle*, 646 F.2d 568 (D.C. Cir. 1980)).

All permits for CSOs should require the nine minimum controls as a minimum best available technology economically achievable and best conventional technology (BAT/BCT) established on a best professional judgment (BPJ) basis by the permitting authority (40 CFR 125.3). Water quality-based requirements are to be established based on applicable water quality standards.

This policy establishes a uniform, nationally consistent approach to developing and issuing NPDES permits to permittees with CSOs. Permits for CSOs should be developed and issued expeditiously. A single, system-wide permit generally should be issued for all discharges, including CSOs, from a CSS operated by a single authority. When different parts of a single CSS are operated by more than one authority, permits issued to each authority should generally require joint preparation and implementation of the elements of this Policy and should specifically define the responsibilities and duties of each authority. Permittees should be required to coordinate system-wide implementation of the nine minimum controls and the development and implementation of the long-term CSO control plan.

The individual authorities are responsible for their own discharges and should cooperate with the permittee for the POTW receiving the flows from the CSS. When a CSO is permitted separately from the POTW, both permits should be cross-referenced for informational purposes.

EPA Regions and States should review the CSO permitting priorities established in the State CSO Permitting Strategies developed in response to the 1989 Strategy. Regions and States may elect to revise these previous priorities. In setting permitting priorities, Regions and States should not just focus on those permittees that have initiated monitoring programs. When setting priorities, Regions and States should consider, for example, the known or potential impact of CSOs on sensitive areas, and the extent of upstream industrial user discharges to the CSS.

During the permittee's development of the long-term CSO control plan, the permit writer should promote coordination between the permittee and State WQS authority in connection with possible WQS revisions. Once the permittee has completed development of the long-term CSO control plan and has coordinated with the permitting authority the selection of the controls necessary to meet the requirements of the CWA, the permitting authority should include in an appropriate enforceable mechanism, requirements for implementation of the long-term CSO control plan, including conditions for water quality monitoring and operation and maintenance.

B. NPDES Permit Requirements

Following are the major elements of NPDES permits to implement this Policy and ensure protection of water quality.

1. Phase I Permits—Requirements for Demonstration of Implementation of the Nine Minimum Controls and Development of the Long-Term CSO Control Plan

In the Phase I permit issued/modified to reflect this Policy, the NPDES authority should at least require permittees to:

a. Immediately implement BAT/BCT, which at a minimum includes the nine minimum controls, as determined on a BPJ basis by the permitting authority;

b. Develop and submit a report documenting the implementation of the nine minimum controls within two years of permit issuance/modification;

c. Comply with applicable WQS, no later than the date allowed under the State's WQS, expressed in the form of a narrative limitation; and

d. develop and submit, consistent with this Policy and based on a schedule in an appropriate enforceable mechanism, a long-term CSO control plan as soon as practicable, but generally within two years after the effective date of the permit issuance/modification. However, permitting authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors that may influence the complexity of the planning process.

The NPDES authority should include compliance dates on the fastest practicable schedule for each of the nine minimum controls in an appropriate enforceable mechanism issued in conjunction with the Phase I permit. The use of enforceable orders is necessary unless Congress amends the CWA. All orders should require compliance with the nine minimum controls no later than January 1, 1997.

2. Phase II Permits—Requirements for Implementation of a Long-Term CSO Control Plan

Once the permittee has completed development of the long-term CSO control plan and the selection of the controls necessary to meet CWA requirements has been coordinated with the permitting and WQS authorities, the permitting authority should include, in an appropriate enforceable mechanism, requirements for implementation of the long-term CSO control plan as soon as practicable. Where the permittee has selected controls based on the "presumption" approach described in Section II.C.4, the permitting authority must have determined that the presumption that such level of treatment will achieve water quality standards is reasonable in light of the data and analysis conducted under this Policy. The Phase II permit should contain:

a. Requirements to implement the technology-based controls including the nine minimum controls determined on a BPJ basis;

b. Narrative requirements which insure that the selected CSO controls are implemented, operated and maintained as described in the long-term CSO control plan;

c. Water quality-based effluent limits under 40 CFR 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the State's WQS, the numeric performance standards for the selected CSO controls, based on average design conditions specifying at least one of the following:

i. A maximum number of overflow events per year for specified design conditions consistent with II.C.4.a.i; or

ii. A minimum percentage capture of combined sewage by volume for treatment under specified design conditions consistent with II.C.4.a.ii; or

iii. A minimum removal of the mass of pollutants discharged for specified design conditions consistent with II.C.4.a.iii; or

iv. performance standards and requirements that are consistent with II.C.4.b. of the Policy.

d. A requirement to implement, with an established schedule, the approved post-construction water quality assessment program including requirements to monitor and collect sufficient information to demonstrate compliance with WQS and protection of designated uses as well as to determine the effectiveness of CSO controls.

e. A requirement to reassess overflows to sensitive areas in those cases where elimination or relocation of the overflows is not physically possible and economically achievable. The reassessment should be based on consideration of new or improved techniques to eliminate or relocate overflows or changed circumstances that influence economic achievability;

f. Conditions establishing requirements for maximizing the treatment of wet weather flows at the POTW treatment plant, as appropriate, consistent with Section II.C.7. of this Policy;

g. A reopener clause authorizing the NPDES authority to reopen and modify the permit upon determination that the CSO controls fail to meet WQS or protect designated uses. Upon such determination, the NPDES authority should promptly notify the permittee and proceed to modify or reissue the permit. The permittee should be required to develop, submit and implement, as soon as practicable, a revised CSO control plan which contains additional controls to meet WQS and designated uses. If the initial CSO control plan was approved under the demonstration provision of Section II.C.4.b., the revised plan, at a minimum, should provide for controls that satisfy one of the criteria in Section II.C.4.a. unless the permittee demonstrates that the revised plan is clearly adequate to meet WQS at a lower cost and it is shown that the additional controls resulting from the criteria in Section II.C.4.a. will not result in a greater overall improvement in water quality.

Unless the permittee can comply with all of the requirements of the Phase II permit, the NPDES authority should include, in an enforceable mechanism, compliance dates on the fastest practicable schedule for those activities directly related to meeting the requirements of the CWA. For major permittees, the compliance schedule should be placed in a judicial order. Proper compliance with the schedule for implementing the controls recommended in the long-term CSO control plan constitutes compliance with the elements of this Policy concerning planning and implementation of a long term CSO remedy.

3. Phasing Considerations

Implementation of CSO controls may be phased based on the relative importance of and adverse impacts upon WQS and designated uses, as well as the permittee's financial capability and its previous *efforts to control* CSOs. The NPDES authority should evaluate the proposed implementation schedule and construction phasing discussed in Section II.C.8. of this Policy. The permit should require compliance with the controls proposed in the long-term CSO control plan no later than the applicable deadline(s) under the CWA or State law. If compliance with the Phase II permit is not possible, an enforceable schedule, consistent with the Enforcement and Compliance Section of this Policy, should be issued in conjunction with the Phase II permit which specifies the schedule and milestones for implementation of the long-term CSO control plan.

V. Enforcement and Compliance

A. Overview

It is important that permittees act immediately to take the necessary steps to comply with the CWA. The CSO enforcement effort will commence with

an initiative to address CSOs that discharge during dry weather, followed by an enforcement effort in conjunction with permitting CSOs discussed earlier in this Policy. Success of the enforcement effort will depend in large part upon expeditious action by NPDES authorities in issuing enforceable permits that include requirements both for the nine minimum controls and for compliance with all other requirements of the CWA. Priority for enforcement actions should be set based on environmental impacts or sensitive areas affected by CSOs.

As a further inducement for permittees to cooperate with this process, EPA is prepared to exercise its enforcement discretion in determining whether or not to seek civil penalties for past CSO violations if permittees meet the objectives and schedules of this Policy and do not have CSOs during dry weather.

B. Enforcement of CSO Dry Weather Discharge Prohibition

EPA intends to commence immediately an enforcement initiative against CSO permittees which have CWA violations due to CSOs during dry weather. Discharges during dry weather have always been prohibited by the NPDES program. Such discharges can create serious public health and water quality problems. EPA will use its CWA Section 308 monitoring, reporting, and inspection authorities, together with NPDES State authorities, to locate these violations, and to determine their causes. Appropriate remedies and penalties will be sought for CSOs during dry weather. EPA will provide NPDES authorities more specific guidance on this enforcement initiative separately.

C. Enforcement of Wet Weather CSO Requirements

Under the CWA, EPA can use several enforcement options to address permittees with CSOs. Those options directly applicable to this Policy are section 308 Information Requests, section 309(a) Administrative Orders, section 309(g) Administrative Penalty Orders, section 309 (b) and (d) Civil Judicial Actions, and section 504 Emergency Powers. NPDES States should use comparable means.

NPDES authorities should set priorities for enforcement based on environmental impacts or sensitive areas affected by CSOs. Permittees that have voluntarily initiated monitoring and are progressing expeditiously toward appropriate CSO controls should be given due consideration for their efforts.

1. Enforcement for Compliance With Phase I Permits

Enforcement for compliance with Phase I permits will focus on requirements to implement at least the nine minimum controls, and develop the long-term CSO control plan leading to compliance with the requirements of the CWA. Where immediate compliance with the Phase I permit is infeasible, the NPDES authority should issue an enforceable schedule, in concert with the Phase I permit, requiring compliance with the CWA and imposing compliance schedules with dates for each of the nine minimum controls as soon as practicable. All enforcement authorities should require compliance with the nine minimum controls no later than January 1, 1997. Where the NPDES authority is issuing an order with a compliance schedule for the nine minimum controls, this order should also include a schedule for development of the long-term CSO control plan.

If a CSO permittee fails to meet the final compliance date of the schedule, the NPDES authority should initiate appropriate judicial action.

2. Enforcement for Compliance With Phase II Permits

The main focus for enforcing compliance with Phase II permits will be to incorporate the long-term CSO control plan through a civil judicial action, an administrative order, or other enforceable mechanism requiring compliance with the CWA and imposing a compliance schedule with appropriate milestone dates necessary to implement the plan.

In general, a judicial order is the appropriate mechanism for incorporating the above provisions for Phase II. Administrative orders, however, may be appropriate for permittees whose long-term control plans will take less than five years to complete, and for minors that have complied with the final date of the enforceable order for compliance with their Phase I permit. If necessary, any of the nine minimum controls that have not been implemented by this time should be included in the terms of the judicial order.

D. Penalties

EPA is prepared not to seek civil penalties for past CSO violations, if permittees have no discharges during dry weather and meet the objectives and schedules of this Policy. Notwithstanding this, where a permittee has other significant CWA violations for which EPA or the State is taking judicial action, penalties may be considered as part of that action for the following:

1. CSOs during dry weather;

2. Violations of CSO-related requirements in NPDES permits; consent decrees or court orders which predate this policy; or

3. Other CWA violations.

EPA will not seek penalties for past CSO violations from permittees that fully comply with the Phase I permit or enforceable order requiring compliance with the Phase I permit. For permittees that fail to comply, EPA will exercise its enforcement discretion in determining whether to seek penalties for the time period for which the compliance schedule was violated. If the milestone dates of the enforceable schedule are not achieved and penalties are sought, penalties should be calculated from the last milestone date that was met.

At the time of the judicial settlement imposing a compliance schedule implementing the Phase II permit requirements, EPA will not seek penalties for past CSO violations from permittees that fully comply with the enforceable order requiring compliance with the Phase I permit and if the terms of the judicial order are expeditiously agreed to on consent. However, stipulated penalties for violation of the judicial order generally should be included in the order, consistent with existing Agency policies. Additional guidance on stipulated penalties concerning long-term CSO controls and attainment of WQS will be issued.

Paperwork Reduction Act

The information collection requirements in this policy have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq* and have been assigned OMB control number 2040–0170.

This collection of information has an estimated reporting burden averaging 578 hours per response and an estimated annual recordkeeping burden averaging 25 hours per recordkeeper. These estimates include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Chief, Information Policy Branch; EPA; 401 M Street SW. (Mail Code 2136); Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and

Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

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Illinois Department of
Natural Resources
One Natural Resources Way • Springfield, Illinois 62702-1271
http://dnr.state.il.us

Rod R. Blagojevich, Governor
Sam Flood, Acting Director

October 21, 2008

Mr. Philippe Moreau
Deuchler Environmental, Inc
230 Woodlawn Ave
Aurora, IL 60506

RE: **Sensitive Area Determination for Outfall No.002**
NPDES Permit No. IL002-818 Special condition 6, Paragraph 7
W.E.D.A. Job #111-06060-05
Natural Heritage Database Review #0903007

Dear Mr. Moreau

This letter is in reference to the project you recently submitted through the EcoCAT (Ecological Compliance Assessment Tool) website. The initial report generated for your project indicated the presence of protected resources in the vicinity of the project location. There are no records in the IDNR database of mussel beds in Fox River from River in Kendall County, Township 37N, Range 8E and Section 5 as indicated on your submission. Records of scattered mussels (none of them state listed species) which means < 1/meter^2. Records of River Redhorse (*Moxostoma carinatum*) are both above and below the stretch of river in the project area. It is not impossible for these fish to be found within the project area. It is recommended that instream work be limited as much as possible. Removal of sewage from flood events would be considered a water quality enhancement.

Consultation is terminated. This review is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified, or additional species, essential habitat or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary. Please contact me if you have questions regarding this review.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statues and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Tracy Evans
Division of Ecosystems and Environment
217-785-5500

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO/

October 22, 2008

Mr. Jared Woodcock
Deuchler Environmental, Inc.
230 Woodlawn Avenue
Aurora, Illinois 60506

Dear Mr. Woodcock:

This responds to your letter dated October 7, 2008 requesting information on endangered or threatened species for a proposed outfall (Outfall No. 002 / NPDES Permit No. IL0020818 / WEDA Job No. 111-06060-05) located at T37N, R8E, Section 5 in Kendall County, Illinois.

Please note, in the future this office can only review projects located within the following six counties of Illinois: Cook, Lake, McHenry, DuPage, Kane, and Will. All other technical assistance requests for northern Illinois should be sent to:
Mr. Richard C. Nelson
U.S. Fish & Wildlife Service
Rock Island Field Office
1511 47th Avenue
Moline, Illinois 61265

Staff from this office is familiar with this proposed project area. Based on the information provided in your submittal and a review of our records, we do not believe that any federally endangered or threatened species occur in the vicinity of the site. This conclusion is based on the best available information, including information in your submittal, the scientific and technical literature, and our own files. Newer information based on updated surveys, changes in the abundance and distribution of listed species, changed habitat conditions, or other factors could change the conclusion. This could become more likely if projects experience significant delays in implementation. Feel free to contact us if you need more current information or assistance regarding the potential presence of federally listed species.

These comments only address federally listed species. Please contact the Illinois Department of Natural Resources for information on State-listed species. Also, we may have the opportunity to review the project for a broader range of fish and wildlife impacts if it requires a Section 404 permit. We are willing to work with you in advance of formal submittal if it would help streamline the approval process.

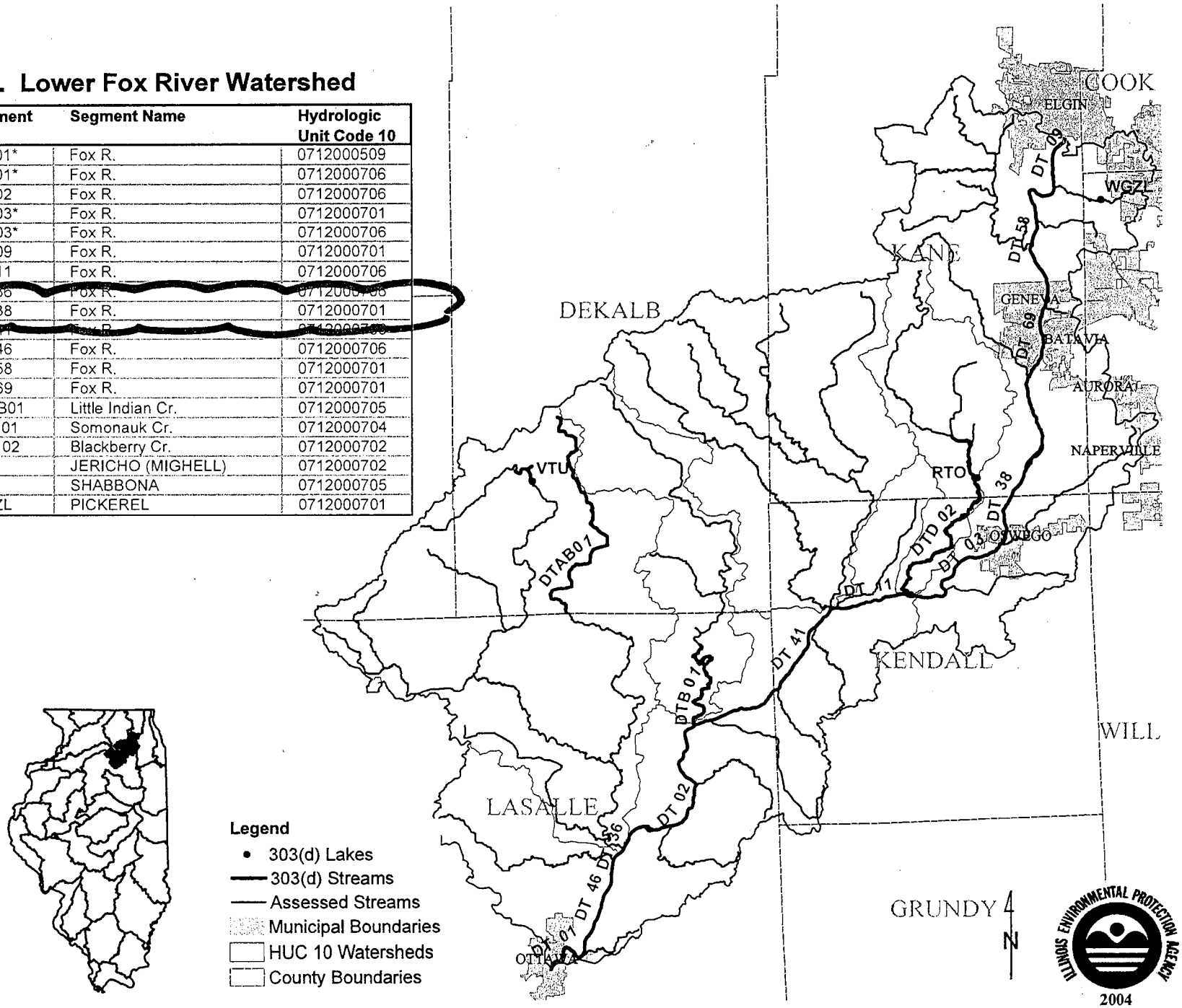
If you have any questions, please contact Ms. Cathy Pollack at 847/381-2253 ext.20, or Ms. Karla Kramer at 847/381-2253 ext. 12.

Sincerely,

John D. Rogner
Field Supervisor

Basin 4. Lower Fox River Watershed

Segment ID	Segment Name	Hydrologic Unit Code 10
DT 01*	Fox R.	0712000509
DT 01*	Fox R.	0712000706
DT 02	Fox R.	0712000706
DT 03*	Fox R.	0712000701
DT 03*	Fox R.	0712000706
DT 09	Fox R.	0712000701
DT 11	Fox R.	0712000706
DT 36	Fox R.	0712000708
DT 38	Fox R.	0712000701
DT 41	Fox R.	0712000708
DT 46	Fox R.	0712000706
DT 58	Fox R.	0712000701
DT 69	Fox R.	0712000701
DTAB01	Little Indian Cr.	0712000705
DTB 01	Somonauk Cr.	0712000704
DTD 02	Blackberry Cr.	0712000702
RTO	JERICHO (MIGHELL)	0712000702
VTU	SHABBONA	0712000705
WGZL	PICKEREL	0712000701



Appendix B-2. Specific Assessment Information for Streams, 2008.

Name	Assessment Unit ID	10-Digit HUC	IEPA Basin	Cat.	Size (miles)	Use Attainment	Causes	Sources
Fox R.	IL_DT-09	0712000701	4	5	8.02	N582, N583, N585, X586, X590	84, 277, 319, 322, 371, 375, 403, 441, 462, 479, 348, 400	125, 28, 58, 142, 23, 140, 177, 85
Fox R.	IL_DT-11	0712000706	4	5	4.81	N582, N583, F585, X586, X590	79, 319, 371, 403, 441, 462, 479, 348	28, 58, 142, 177, 85, 140
Fox R.	IL_DT-18	0712000612	3	5	5.84	N582, N583, F584, X585, X586, X590	84, 246, 319, 322, 371, 403, 274, 348	125, 28, 58, 85, 23, 177, 10, 140
Fox R.	IL_DT-20	0712000612	3	5	7.03	N582, N583, X585, X586, X590	84, 319, 322, 348	157, 58, 140
Fox R.	IL_DT-22	0712000611	3	5	7.83	N582, N583, X584, N585, X586, X590	84, 319, 322, 371, 403, 441, 479, 348, 400	58, 157, 142, 177, 95, 140
Fox R.	IL_DT-23	0712000611	3	5	7.61	N582, N583, F585, F586, X590	84, 319, 322, 463, 479, 348	142, 157, 58, 140
Fox R.	IL_DT-35	0712000610	3	5	4.9	N582, N583, N585, X586, X590	319, 371, 403, 479, 348, 400	58, 144, 95, 140
Fox R.	IL_DT-36	0712000706	4	5	2.06	N582, N583, X585, X586, X590	246, 319, 463, 479, 348	28, 58, 140
Fox R.	IL_DT-38	0712000701	4	5	12	N582, N583, F584, N585, X586, X590	84, 319, 322, 371, 403, 441, 462, 479, 274, 348, 400	125, 58, 142, 23, 177, 85, 10, 140
Fox R.	IL_DT-41	0712000706	4	5	10.9	F582, N583, X585, X586, X590	348	140
Fox R.	IL_DT-46	0712000706	4	5	3.7	N582, N583, X585, X586, X590	319, 371, 403, 441, 274, 348	58, 132, 144, 10, 140
Fox R.	IL_DT-58	0712000701	4	5	4.22	N582, N583, X585, X586, X590	84, 319, 322, 274, 348	125, 58, 10, 140
Fox R.	IL_DT-69	0712000701	4	5	4.21	N582, N583, F585, X586, X590	84, 177, 246, 277, 319, 322, 371, 403, 441, 462, 479, 274, 348	125, 28, 58, 142, 177, 85, 10, 140
Fraction Run	IL_GHA	0712000407	2	3	7.13	X582, X583, X585, X586, X590	N/A	N/A

Appendix B-2. Specific Assessment Information for Streams, 2008.

Legend

Use ID	Use Description
582	Aquatic Life
583	Fish Consumption
584	Public and Food Processing Water Supplies
585	Primary Contact
586	Secondary Contact
587	Indigenous Aquatic Life
590	Aesthetic Quality

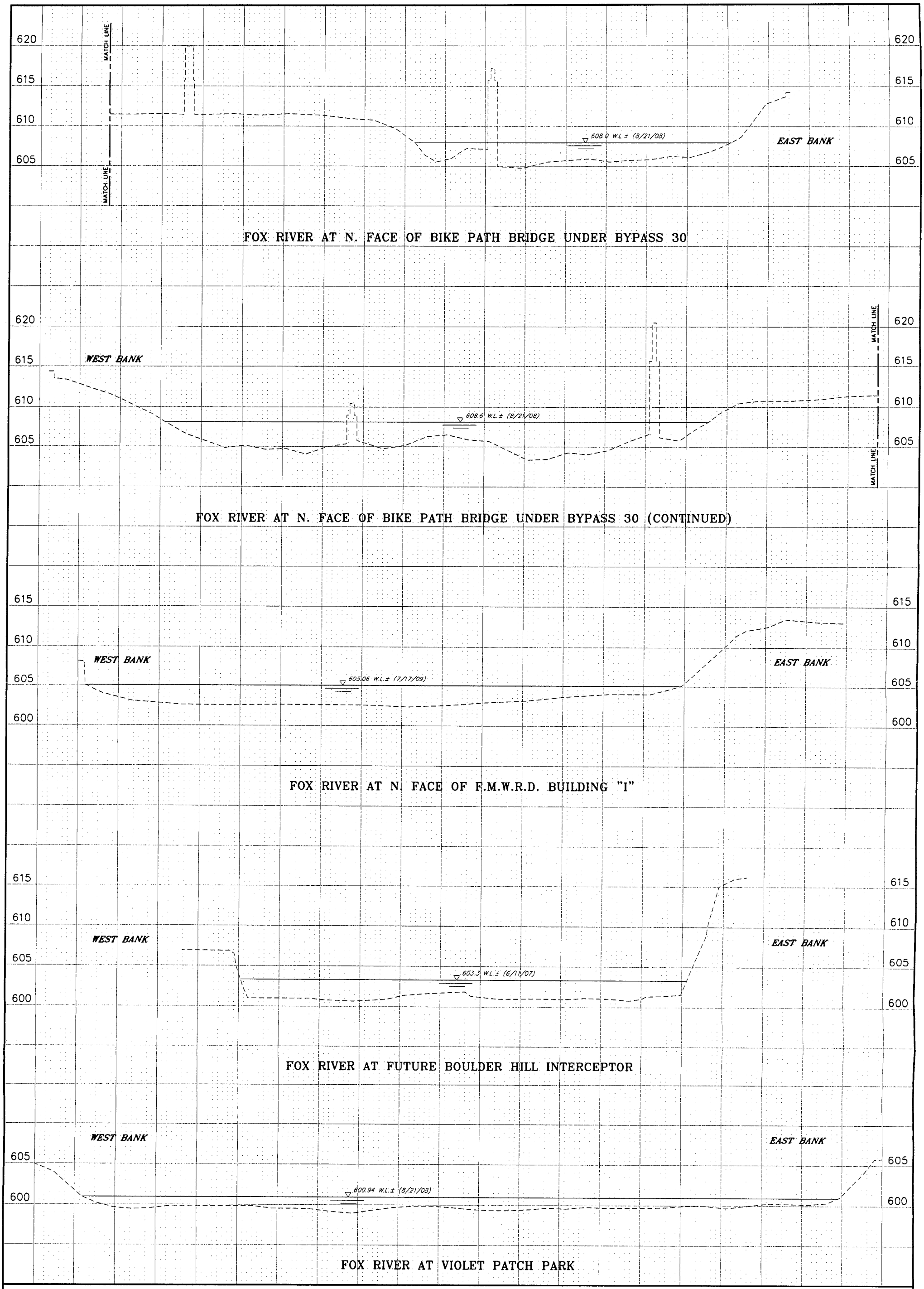
Support Code	Use Support Level
F	Fully Supporting
N	Not Supporting
I	Insufficient Information
X	Not Assessed

Cause ID	Description
N/A	No Cause Identified
1	.alpha.-BHC
79	Aldrin
84	Alteration in stream-side or littoral vegetative covers
91	Ammonia (Un-ionized)
96	Arsenic
99	Atrazine
104	Barium
123	Boron
127	Cadmium
137	Chlordane
138	Chloride
139	Chlorine
154	Chromium (total)
163	Copper
168	Cyanide
177	DDT
198	Dieldrin
203	Dioxin (including 2,3,7,8-TCDD)
213	Endrin
228	Fish-Passage Barrier
229	Fish Kills
234	Fluoride
244	Heptachlor
246	Hexachlorobenzene
260	Iron
267	Lead

Cause ID	Description
268	Lindane
273	Manganese
274	Mercury
277	Methoxychlor
301	Nickel
308	Ammonia (Total)
313	Nonnative Fish, Shellfish, or Zooplankton
317	Oil and Grease
319	Other flow regime alterations
322	Oxygen, Dissolved
339	Phenols
348	Polychlorinated biphenyls
371	Sedimentation/Siltation
375	Silver
385	Sulfates
388	Temperature, water
400	Fecal Coliform
403	Total Suspended Solids (TSS)
423	Zinc
441	pH
452	Nitrogen, Nitrate
462	Phosphorus (Total)
463	Cause Unknown
478	Aquatic Plants (Macrophytes)
479	Aquatic Algae
500	Changes in Stream Depth and Velocity Patterns
501	Loss of Instream Cover

Source ID	Description
N/A	No Source Identified
2	Acid Mine Drainage
4	Animal Feeding Operations (NPS)
10	Atmospheric Depositon - Toxics
20	Channelization
23	Combined Sewer Overflows
28	Contaminated Sediments
32	Dam Construction (Other than Upstream Flood Control Projects)
36	Drainage/Filling/Loss of Wetlands
38	Dredging (E.g., for Navigation Channels)
45	Golf Courses
49	Highway/Road/Bridge Runoff (Non-construction Related)
50	Highways, Roads, Bridges, Infrasturcture (New Construction)
56	Impacts from Abandoned Mine Lands (Inactive)
58	Impacts from Hydrostructure Flow Regulation/modification
61	Industrial Land Treatment
62	Industrial Point Source Discharge
66	Irrigated Crop Production
72	Loss of Riparian Habitat
73	Managed Pasture Grazing
82	Mine Tailings
85	Municipal Point Source Discharges
87	Non-irrigated Crop Production

Source ID	Description
92	On-site Treatment Systems (Septic Systems and Similar Decencentralized Systems)
95	Other Recreational Pollution Sources
97	Other Spill Related Impacts
102	Petroleum/natural Gas Activities
115	Sanitary Sewer Overflows (Collection System Failures)
122	Site Clearance (Land Development or Redevelopment)
125	Streambank Modifications/destablization
127	Surface Mining
130	Unpermitted Discharge (Domestic Wastes)
132	Upstream Impoundments (e.g., Pl-566 NRCS Structures)
135	Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)
140	Source Unknown
142	Dam or Impoundment
143	Livestock (Grazing or Feeding Operations)
144	Crop Production (Crop Land or Dry Land)
155	Natural Sources
156	Agriculture
157	Habitat Modification - other than Hydromodification
177	Urban Runoff/Storm Sewers
178	Coal Mining (Subsurface)
179	Lake Fertilization
181	Runoff from Forest/Grassland/Parkland



SCALE: 1"=20' HOR.
1"=5' VERT.

WALTER E. DEUCHLER ASSOCIATES, INC.
Consulting Engineers – Aurora, Illinois

©

REVISIONS				
DATE 7/20/09	DESIGNED JWF	DRAWN SAL	APPROVED JWF	BOOK 1968.204.21
SCALE SHOWN	CAD DWG. F:\ASD\06060-07\XSEC		JOB NO. 111/06060/07	

CSO LTCP – CAC MEETING #4

FOX RIVER – CROSS SECTIONS

FOX METRO WATER RECLAMATION DISTRICT

SHEET 1 OF 1

MEETING AGENDA

CAC Meeting No. 5
August 26, 2009
11:00 a.m. to 1:00 p.m.

Introductions	11:00 a.m.

Review Meeting Minutes – CAC Meeting No. 4
Handouts for CAC Meeting No. 5

Presentation	11:15 a.m.

Topic: Fox River Water Quality Assessment

- Water Chemistry (John Frerich)
- Macroinvertebrates (Karen Clementi)
- Fish and Mussels (Jared Woodcock)

Lunch and Open Discussions	12:30 p.m.
Adjournment	1:00 p.m.

MEETING MINUTES

CAC Meeting No. 4
July 21, 2009 at 11:00 a.m.

Purpose: Meeting No. 4 served to provide the members with an understanding of "sensitive areas" as defined by the USEPA and to determine if a sensitive area exists along the Fox River in the vicinity of the Fox Metro Water Reclamation District's CSO outfall at the wastewater treatment plant.

Attendees:

CAC Members	
Daryl Devick	City of Aurora
Judith Sotir	Fox Metro WRD
Tim Pollowy	Fox River Ecosystem Partnership
Jackie Dearborn*	United City of Yorkville
Michael Glock	Village of North Aurora
Bill Donnell	Fox Valley Park District
Mark Runyon**	Village of Oswego
Brad Merkel	Village of Sugar Grove
CAC Support Staff	
Tom Muth	Fox Metro WRD
Jeff Humm	Fox Metro WRD
Roy Harsch	Drinker Biddle & Reath
Philippe Moreau	Walter E. Deuchler Associates, Inc.
John Frerich	Walter E. Deuchler Associates, Inc.

* **alternate for Joe Wywrot, United City of Yorkville**
** **alternate for Jerry Weaver, Village of Oswego**

Distribution: The above attendees and the following:

CAC Members	
Michael Pubentz	Village of Montgomery
Fran Caffee	Sierra Club, Valley of the Fox Group
Other Guests	
Jay Patel	Illinois EPA

Discussion Items:

1. John Frerich welcomed everyone. The following information was handed out to each member to include in their binders: meeting agenda for Meeting No. 4; meeting minutes for Meeting No. 3; a PowerPoint presentation handout of today's topic "Sensitive Areas"; a copy of the "USEPA Combined Sewer Overflow Control Policy" as published on April 19, 1994 at 59 Federal Register 18688; letter from the IDNR dated October 21, 2008; letter from the USFWS dated October 22, 2008; excerpts from Appendix B-2 of the Illinois Integrated Water Quality Report and Section 303(d) List – 2008 for the Fox River segment along the wastewater treatment plant; and an 11"x17" exhibit titled "Fox River – Cross Sections" depicting the river bed and water level of a few sections of the Fox River upstream and downstream of the District's CSO outfall at the wastewater treatment plant.

2. John Frerich gave a PowerPoint presentation regarding "Sensitive Areas". The general points of discussion were:

   a. Regulatory Policies of CSOs and Sensitive Areas
      i. USEPA CSO Control Strategy (Sept. 8, 1989) – objectives of the policy
      ii. USEPA CSO Control Policy (April 19, 1994) – fundamental principles of the policy
      iii. Enforcement of above policies via NPDES permit requirements – Item 7. of Special Condition 14. of the District's NPDES Permit No. IL0020818

   b. Sensitive Area Criteria - Section II.C.3 of the 1994 CSO Control Policy
      i. Highest priority given to controlling overflows to sensitive areas. For such areas, the LTCP should:
         - Prohibit new or significantly increased overflows
         - Eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment; or where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide

the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses

- Where elimination or relocation has been proven not to be physically possible and economically achievable, for each subsequent permit term, require a reassessment based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economic achievability

ii. Sensitive Area Criteria

- Outstanding National Resource Waters
- Waters containing threatened or endangered species and their habitat
- Shellfish beds
- Public drinking water intakes or their designated protection areas
- Primary contact recreational areas

c. Sensitive Area Analysis

i. Outstanding National Resource Waters

- January 12, 2009 e-mail from IEPA indicating no waters listed as Outstanding National Resource Waters
- Segment of Fox River designated as "impaired" on Section 303(d) list

ii. Waters containing threatened or endangered species and their habitat

- October 21, 2008 letter from IDNR indicating no threatened or endangered species in the project area. The River Redhorse fish has been sampled in waters both upstream and downstream of the project area.
- October 22, 2008 letter from USFWS indicating no threatened or endangered species or their habitat in the project area.

iii. Shellfish beds

- October 22, 2008 letter from USFWS indicating no records of shellfish beds in the project area.
- Mussel sampling study in 2008 collected 15 mussels representing 6 species in the area downstream of the CSO outfall. None of the mussels sampled were living and all were classified as weathered.

iv. Public drinking water intakes or their designated protection areas

- City of Aurora water supply is a combination of groundwater wells and Fox River water – river intake located 4.5 miles upstream of CSO outfall
- Village of Montgomery water supply is solely groundwater wells
- Village of Oswego water supply is solely groundwater wells
- No other known public drinking water intakes downstream of CSO outfall

v. Primary contact recreational areas

- Illinois water quality standards definitions of primary contract and secondary contact; primary contact involves activities of prolonged and intimate contact with the water involving considerable risk of ingesting the water in quantities sufficient to pose a significant health hazard, such

as swimming, water skiing, etc.

- Illinois Integrated Water Quality Report and Section 303(d) List – 2008 use attainment, causes of impairment and sources of impairment
- Based on the most stringent criteria (bacteria – fecal coliform), water sampling has shown that this segment of the river does not meet WQS 40% of the time in dry weather and 100% of the time in and immediately after wet weather. CSOs contribute, but are not only source of impairment
- Fox River is too shallow near the CSO outfall to support primary contact recreational activities and even some secondary contact activities
- Access to west bank of the Fox River in the vicinity of the CSO outfall is limited by fences, locked gates and railroad right-of-way. Property along the west bank upstream of the CSO outfall is zoned General Manufacturing. This property was also the site of an environmental cleanup that would limit the uses of the property in the future. Property along the west bank downstream of the CSO outfall is owned by the District down to the ComEd right-of-way and is the intended site for future plant expansion

d. Sensitive Area Determination – based on the information presented, it was concluded by Walter E. Deuchler Associates that the District's CSO outfall did not meet any of the five (5) criteria for sensitive areas as defined by the USEPA.

3. An open discussion ensued upon conclusion of the presentation. The key topics of discussion included the following:

a. Judith Sotir inquired if there was a procedure for reevaluating the sensitive area criteria due to future changes or improvements to the Fox River. Roy Harsch answered that the USEPA guidelines require a reassessment of the sensitive area during each subsequent renewal period of the District's NPDES permit (every 5 years) based on new or improved techniques to eliminate or relocate, or on changed circumstances that influence economic achievability for those CSO outfalls where elimination or relocation has been proven not to be physically possible and economically achievable.

b. Bill Donnell asked what the boundary limits for the sensitive area determination were and/or the area of influence from the CSO outfall. Roy Harsch stated that he is not aware of any set guideline or rule defining this and that his experience is that the discharger and the regulatory agency look to the pollutant of concern and the stream in question and make a judgment as to the likely extent of any impact. John Frerich added that the boundary limits of the water quality sampling being performed by Walter E. Deuchler Associates are the Sullivan Road Bridge in North Aurora (upstream) and the U.S. Route 34 Bridge in Oswego (downstream).

c. Bill Donnell discussed the recent environmental cleanup conducted by Nicor in the Fox River in the vicinity of the North Avenue Bridge. Prior to the work, a shellfish rescue was conducted which resulted in the relocation of a large number of shellfish/mussels.

d. Bill Donnell asked if someone could elaborate on the environmental issues with the former AT&T property located immediately north of the WWTP and the CSO outfall. Philippe Moreau responded that the property is approximately 45 acres and has undergone several phases of environmental assessment and remediation since the mid 1990's to the present. The site has been enrolled in the Illinois EPA Site Remediation Program (SRP). The north half, which contained the former operation buildings had soil and groundwater contamination of metals and chlorinated solvents, such as TCE. It was treated via Low Temperature Thermal Desorption (LTTD). The south half, which contained the former parting labs had also undergone treatment for soil with metals in excess of the hazardous waste toxicity levels. A hazardous waste remediation was conducted under the IEPA RCRA program. The treated soils were placed back into the excavation as a RCRA Remediation Action Plan Permit. The site is still undergoing groundwater monitoring, inspection of the facility by IEPA and has a 30-year post-closure care period.

e. Tim Pollowy inquired about the historic locations that the River Redhorse was found by IDNR both upstream and downstream of the CSO outfall area. Roy Harsch stated that the River Redhorse had been found upstream in the Geneva area. Tom Muth said that the District had to work around construction restrictions for River Redhorse spawning months by the IDNR for a utility crossing of the Fox River downstream in the vicinity of the Orchard Road Bridge. John Frerich advised that an extensive fish study conducted by Walter E. Deuchler Associates in 2008 and continuing again this year has not revealed any River Redhorse in the study area between the Sullivan Road Bridge in North Aurora and the U.S. Route 34 Bridge in Oswego. This study will be discussed in greater detail at the next CAC meeting.

f. Bill Donnell supported the no observation of boating, water skiing or jet skiing in the Fox River near the location of the CSO outfall. To the best of his knowledge, the nearest boat ramp is located downstream (approximately 2.1 miles) in a park near the U.S. Route 34 Bridge. However, this boat ramp is for emergency use only and is not accessible to the public.

Action Items: A vote was taken of the CAC members as to whether or not the District's CSO outfall discharges into a sensitive area. **Results of the vote: Yes it discharges into a sensitive area – 0 votes; No, it does not discharge into a sensitive area – 8 votes.**

Next CAC Meeting: The next meeting is scheduled for Wednesday, August 26, 2009 at 11:00 a.m. at the Fox Metro Water Reclamation District W.J. "Ben" Baines Memorial Administration Building located at 682 State Route 31, Oswego, IL

The above constitutes our understanding of the information discussed and the decisions reached. Any corrections or clarifications should be directed in writing to the attention of the author.

Prepared by: John W. Frerich, P.E.

Fox Metro
Water Reclamation District

POINTS OF DISCUSSION

1) General Background
2) Water Chemistry Sampling
3) Benthic Macroinvertebrate Sampling
4) Fish and Mussel Sampling

WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

Fox Metro

REGULATORY POLICY

EPA CSO Control Policy (April 19, 1994)

1) **Characterization, Monitoring and Modeling of the CSS**
   - Thorough understanding of sewer system
   - Response of system to various rain events
   - Characteristics of overflows
   - Water quality impacts resulting from CSOs
2) **Main elements of CSS Characterization**
   - Rainfall Records
   - CSS Characterization
   - CSO Monitoring

WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

Fox Metro

REGULATORY POLICY

Section II.C.2 of 1994 CSO Control Policy

CSO Monitoring – Develop comprehensive, representative monitoring program including:
- CSO effluent monitoring
- Ambient in-stream monitoring
- Biological assessment

Allows for representative sampling of overflow points

WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

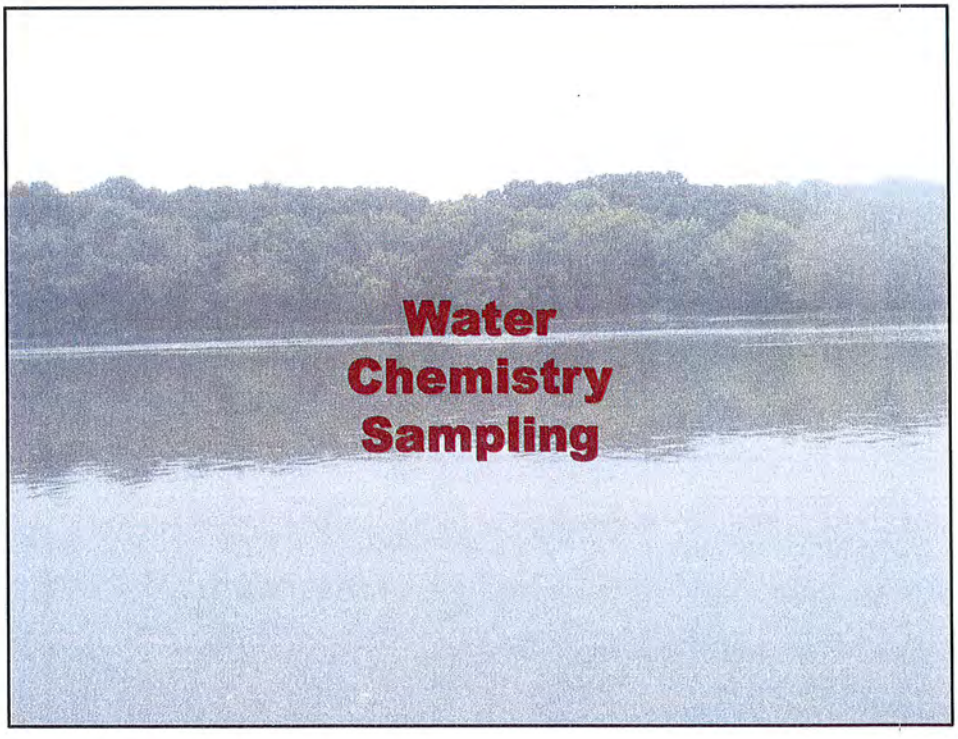
Fox Metro
Water Reclamation District

QUALITY ASSURANCE PROJECT PLAN

Document developed to establish policies and procedures for completing the various CSO and stream monitoring tasks. Identifies:

- Sampling Locations
- Sampling Frequency and Duration
- Sampling Methods
- Sampling Handling
- Analytical Methods
- Instruments and Equipment
- Quality Control
- Data Management

WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS



WATER CHEMISTRY

Fox River Sampling

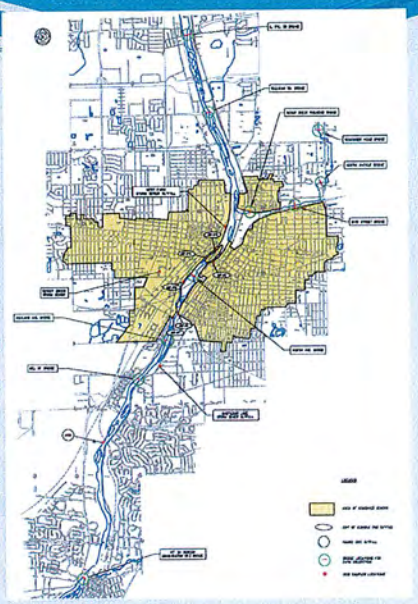
- Sullivan Road Bridge in Aurora to U.S. Route 34 Bridge in Oswego (5 bridges)

Indian Creek Sampling

- Reckinger Road Bridge in Aurora to Indian Creek outfall (4 bridges)

CSO/Storm Sewer Sampling

- 7 CSO Outfalls
- 3 Storm Sewer Outfalls



WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

Fox Metro
Water Reclamation District

WATER CHEMISTRY SAMPLING PARAMETERS

Laboratory Analysis

Fecal Coliform
$CBOD_5$
Total Suspend Solids
Ammonia Nitrogen
Nitrate
Nitrite
Total Phosphorus
Dissolved Phosphorus
Total Kjedahl Nitrogen
Chloride
Fluoride
Chlorophyll a (bridges only)

Field Measurements

Dissolved Oxygen (bridges only)
Temperature (bridges only)
Ph
Specific Conductivity

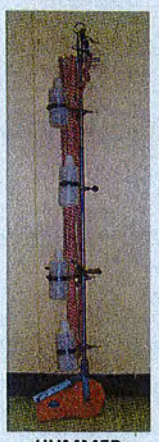
WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

Fox Metro
Water Reclamation District

WATER CHEMISTRY SAMPLING EQUIPMENT

US DH-2A SUSPENDED-SEDIMENT SAMPLER

VAN-DORN BETA SAMPLER



HUMMER SAMPLER

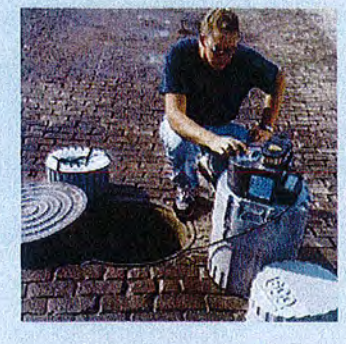
YSI 6600EDS V2 SONDES

YSI HANDHELD MULTIPARAMETER PROBE

Fox Metro
Water Reclamation District

WATER CHEMISTRY SAMPLING EQUIPMENT

CSO and storm sewer outfall samples collected using programmable, automated Isco samplers triggered by Isco flow meters



WALTER E. DEUCHLER ASSOCIATES, INC
CONSULTING ENGINEERS

WATER CHEMISTRY SAMPLING DURATIONS

1) May 1st thru October 31st
2) Bi-monthly to monthly bridge sampling (9 bridges)
   - 10-15 samples across bridge to develop 1 composite sample per bridge for laboratory analysis parameters, except fecal coliform
   - 1 grab sample at center of bridge for fecal coliform
   - Field measurement parameters recorded with handheld multiparameter probe

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WATER CHEMISTRY SAMPLING DURATIONS

1) May 1st thru October 31st

2) Intensive sampling of bridges (4 locations), CSOs (7 locations) and storm sewer outfalls (3 locations) during and immediately after significant rain events (for a period of approximately 5 hours) following a dry weather period of 7-10 days
   - 3 individual samples taken at 15 minute intervals across bridge for laboratory analysis parameters
   - Field measurement parameters recorded by Sondes
   - CSO and Storm Sewer Outfall samples collected by Isco samplers at intervals varying between 5 minutes and 1 hour

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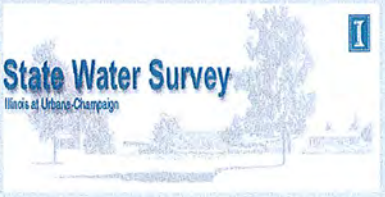
WATER CHEMISTRY SAMPLING MODELING

Results to be used in development of long-term water quality model simulation

EPA WASP MODEL

Illinois State Water Survey
Illinois at Urbana-Champaign



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WATER CHEMISTRY SAMPLING

Questions?

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Benthic Macroinvertebrate Sampling

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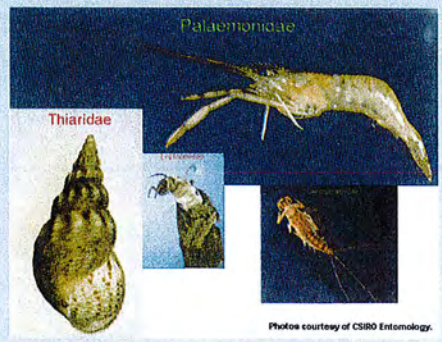
MACROINVERTEBRATE SAMPLING

- Cost Effective
- Stationary Sampling
- Demonstrates Sensitivity to Pollution



Photos courtesy of CSIRO Entomology.

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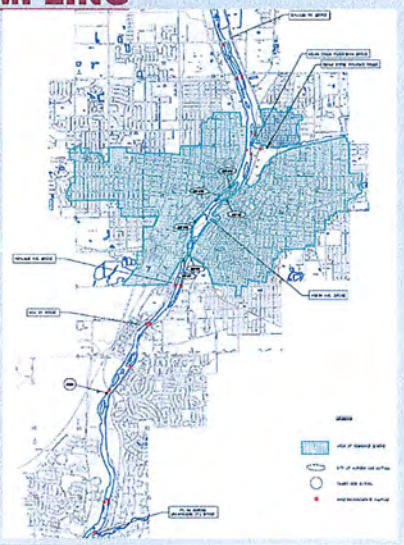
MACROINVERTEBRATE SAMPLING

Sample Area

- Sullivan Road Bridge in Aurora to U.S. Route 34 Bridge in Oswego



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MACROINVERTEBRATE EQUIPMENT

Hester Dendy Samplers

- Multiple plate sampler (14 hardboard plates) 7.5 cm in dia.
- For Fox River
- Deployed for 5-6 weeks at fixed sites

Kick Nets

- 3 ft. x 3 ft., 500 micron square mesh
- For Waubonsee and Indian Creeks

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MACROINVERTEBRATE SAMPLING

Sampling Dates

- August 2006
- July 2007
- July 2008
- August 2008
- September 2008
- 2009 - ongoing

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MACROINVERTEBRATE CHALLENGES

1) High River Flows
2) Flooding
3) Fishermen

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MACROINVERTEBRATE RESULTS

Macroinvertebrate Biotic Index (MBI)

Rating	MBI score
Excellent	<=4.35
Good	4.36-5.00
Fair	5.01-5.70
Poor	5.71-6.25
Very Poor	>=6.26

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MACROINVERTEBRATE RESULTS - 2006

Locations (north to south)	Round 1
Indian Trail West	6.06 Poor
Indian Trail East	LOST
West Park West	9.93 Very Poor
Fox River at Indian Creek D.S.	8.54 Very Poor
North Ave. West	5.95 Poor
North Ave. East	5.79 Poor
Mill St. West	4.92 Good
Mill St. East	5.40 Fair
FMWRD	5.99 Poor

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MACROINVERTEBRATE RESULTS - 2007

Locations (north to south)	Round 1
Sullivan Road	7.76 Very Poor
West Park West	11.00 Very Poor
Fox River at Indian Creek D.S.	LOST
North Ave. West	7.01 Very Poor
North Ave. East	7.12 Very Poor
Mill St. West	6.52 Very Poor
Mill St. East	6.46 Very Poor
FMWRD	6.00 Poor

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MACROINVERTEBRATE RESULTS - 2008

Locations (upstream to downstream)	Round 1	Round 2	Round 3
Sullivan Rd.	Lost	6.50 Very Poor	Lost
U.S. Of Ill. Ave. W. Bank	Not Placed	6.29 Very Poor	5.72 Poor
Pierce St.	9.52 Very Poor	Lost	9.43 Very Poor
Indian Creek (Grab)	Not Collected	Not Collected	5.74 Poor
West Park West	5.89 Poor	6.73 Very Poor	Lost
Fox River @ Indian Creek D.S.	Lost	Lost	5.96 Poor
Ashland Ave. East	Not Placed	9.24 Very Poor	9.64 Very Poor
Ashland Ave. West	Not Placed	6.73 Very Poor	Lost
Mill St. East	Lost	Lost	Not Placed
Mill St. West	Lost	5.55 Fair	Lost
Rt. 30 Pedestrian Walkway	Not Placed	Not Placed	6.94 Very Poor
FMWRD	5.53 Fair	6.18 Poor	Lost
Millstone Park West	Not Placed	5.66 Fair	Lost
Millstone Park East	Not Placed	Lost	Lost
Waubonsee Creek (Grab)	Not Collected	Not Collected	5.98 Poor

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MACROINVERTEBRATE RESULTS

Conclusions to Date

- Water quality of the Fox River upstream of the Aurora and FMWRD CSO outfalls is poor
- River segment upstream of New York Street is the worst area (highest MBI scores) – even though CSO discharges in this area have been significantly reduced since 2001
- Water quality appears to improve downstream of Mill Street – likely due to oxygenation provided by Montgomery Dam

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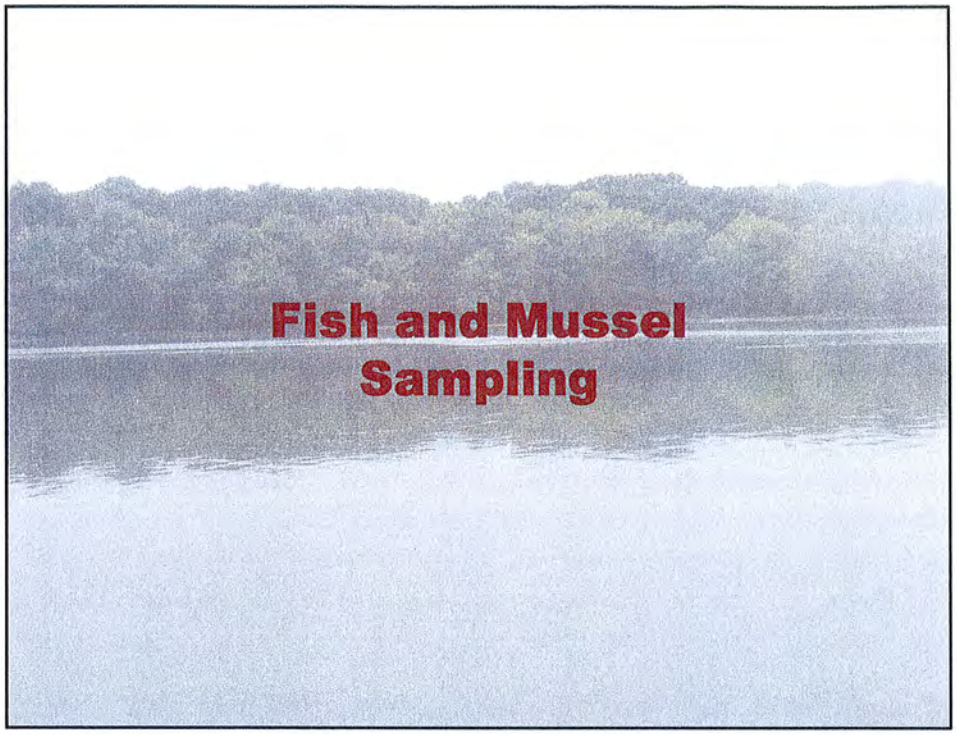
MACROINVERTEBRATE SAMPLING

Questions?



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FISH SAMPLING

Long-term assessment of fish assemblage in the Fox River

1) **Fish community composition;**
2) **Overall trends of fish assemblage**

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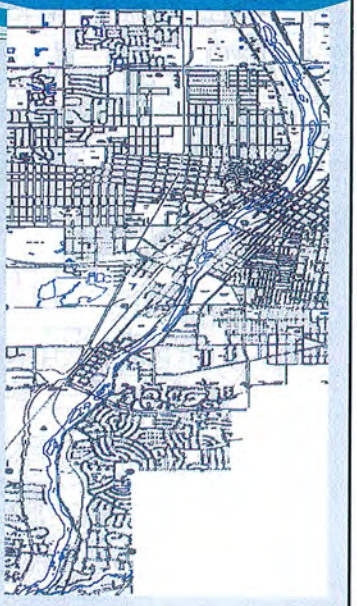
FISH SAMPLING

Sample Area

- Sullivan Road Bridge in Aurora to U.S. Route 34 Bridge in Oswego

Divided into 4 segments

- Excludes certain areas due to dams, insufficient water, etc.



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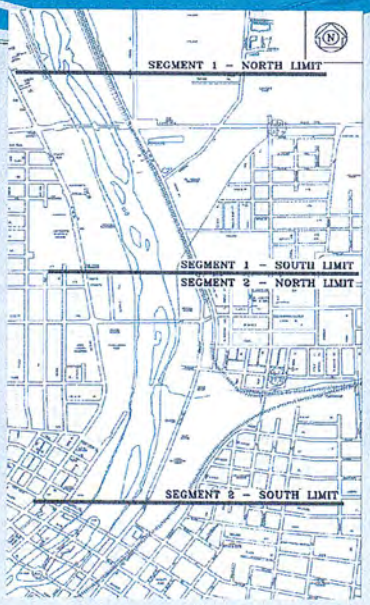
FISH SAMPLING LOCATIONS

Segment 1

- Sullivan Road Bridge in Aurora to upstream of Illinois Avenue Bridge in Aurora

Segment 2

- Upstream of Illinois Avenue Bridge in Aurora to upstream of New York Street Dam in Aurora



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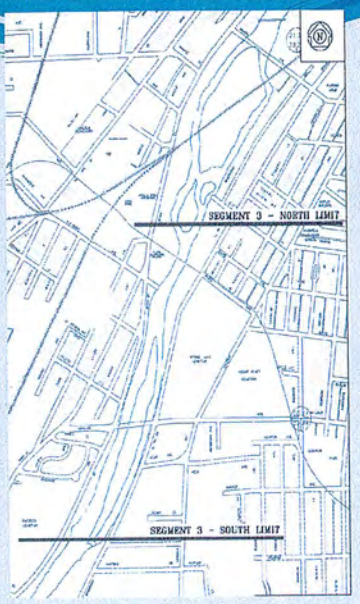
FISH SAMPLING LOCATIONS

Segment 3

- North Avenue Bridge in Aurora to Montgomery Dam in Montgomery



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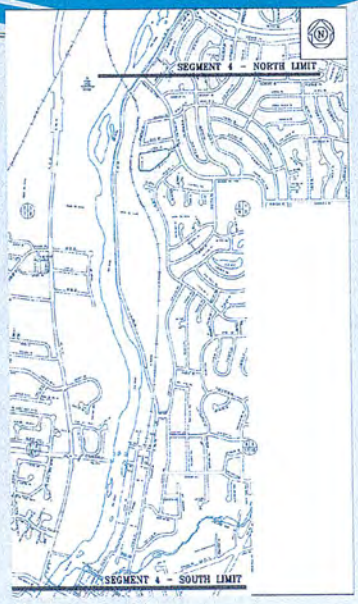
FISH SAMPLING LOCATIONS

Segment 4

- Upstream of Fox Metro Water Reclamation District to U.S. Route 34 Bridge in Oswego



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FISH SAMPLING DURATION

- August 15th thru October 31st in 2008
- March 31st thru October 31st each subsequent year
- Sample 1 segment each week

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FISH SAMPLING EQUIPMENT

Trap Nets

- 6 ft X 4 ft box with 4 rings, 50 ft lead, ½ in square mesh

Mini Trap Nets

- 3 ft X 2 ft box with 2 rings, 10 ft lead, 1/8 in square mesh

Deployed for roughly 24 hours as a pair

Random and Fixed sites

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FISH SAMPLING EQUIPMENT

5.0 GPP Electrofisher System (Smith-Root)

- pulsed D.C.
- Sample along banks, open/main channel, and fish cover

Minnow Seine

- 6 ft X 30 ft, 1/8 in square mesh
- Pulled parallel to bank

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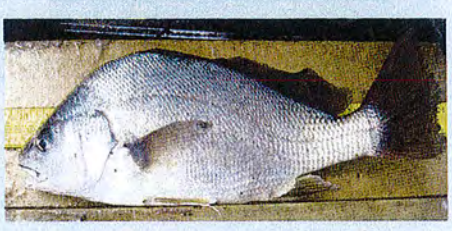
FISH SAMPLING HANDLING

- Fish are identified, weighed (g), measured (mm), and released
- Minnows and unidentified fish are preserved in 10% formalin for at least 2 weeks
- Voucher specimens transferred to 70% alcohol



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FISH SAMPLING

Common Species

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FISH SAMPLING RESULTS

Fox Metro Water Reclamation District

2008-2009 Sampling Results

1) **8013 total fish sampled**
   - Segment 1: 1577
   - Segment 2: 3067
   - Segment 3: 2391
   - Segment 4: 978

2) **Sampled 46 species from 12 families**
   - Segment 1: 34 species, 11 families
   - Segment 2: 40 species, 11 families
   - Segment 3: 32 species, 9 families
   - Segment 4: 32 species, 9 families

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Fox Metro Water Restoration District

FISH SAMPLING RESULTS

1) 8013 total fish sampled
   - Electrofishing: 2252
   - Trap Nets: 3372
   - Minnow Seine: 2389

2) Sampled 46 species from 12 families

3) IDNR 1994-2002
   - 1589 total fish sampled
   - 38 species from 8 families

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FISH SAMPLING RESULTS

DO Sensitive Species

1) 31 species in IL

2) Sampled 5 species in Fox River
   - common shiner
   - smallmouth bass
   - black redhorse
   - silver redhorse
   - stonecat

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MUSSEL SAMPLING

1) Hand grab method
   - 4 man hours

2) 2008 limited sampling due to high flow conditions

3) 2009 sampling in mid August

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MUSSEL SAMPLING RESULTS

2008 Sampling Results

FMWRD CSO outfall
- 15 total mussels
- 6 species
- No living specimens

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MUSSEL SAMPLING RESULTS

2009 Sampling Results

1) 4 sampling sites
2) 158 living specimens
3) 8 species

- North Avenue: 114 live specimens, 6 species (1 Invasive)
- Violet Patch Park East bank: 3 live specimens, 2 species (1 Invasive)
- Violet Patch Park West bank: 0 live specimens
- Hudson Crossing Park: 41 live specimens, 3 species (37 Invasive)

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FISH AND MUSSEL SAMPLING

Questions?

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